
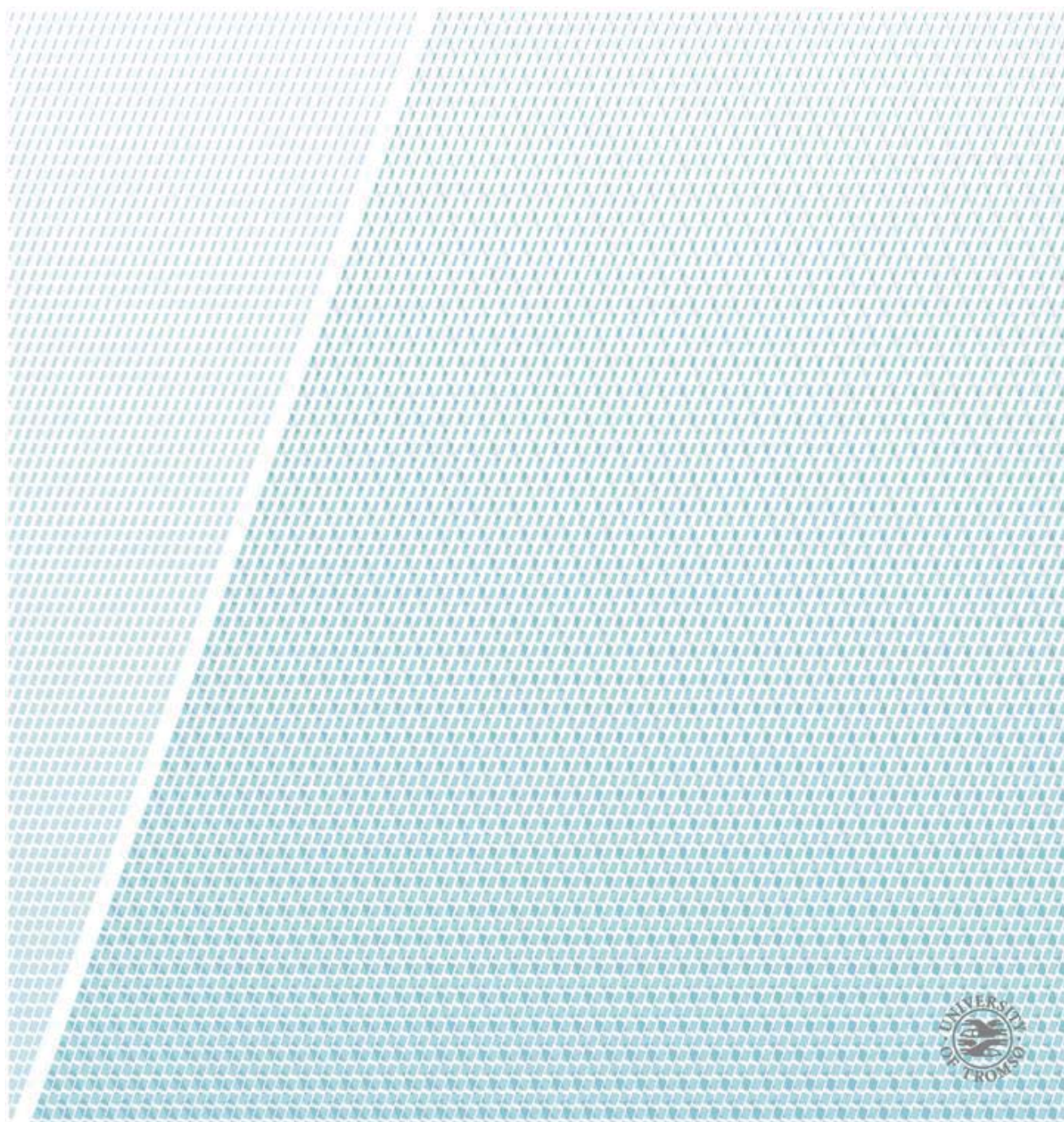


## Poverty and Credit:

*How Microcredit Reduced the Costs of Lending to the Poor*

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Dissertation in Economics (SOK – 2050) – May 2015



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## **Abstract**

Microcredit, held up for decades as something of a “miracle cure” for world poverty, has in recent years been the subject of many controversies in many continents. But the debates have usually been grounded in anecdotes, with fruit sellers turning into fruit magnates on the one hand and deeply indebted borrowers on the other, rather than hard evidence of the effect on the average borrower. This dissertation tries to shed some light over these debates by reviewing some of the existing theoretical and empirical literature on microcredit and credit markets. To complete this task, it first shows how the credit market’s responses to the informational problems inherent in lending can explain most of the features of rural credit markets. Next it explains how the canonical model of microcredit – characterized by joint liability, dynamic incentives, group meetings and frequent repayments – by transferring risk from lenders to borrowers coupled with the benefits of the transaction design reduced the costs of providing small loans to the poor. Finally, it reviews some of the recent finding on the impact of microcredit. The dissertation concludes that although access to credit may be powerful for some, it does not raise income for all. Thus, microcredit may not be the miracle cure it was held to be, but it ended the old debate about whether the poor are bankable or not once and for all.

## Acknowledgements

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## List of Notation

$\eta$  = cost of default

$\rho$  = cost of capital

$\phi$  = fixed administrative cost

$k$  = invested amount

$r$  = gross interest rate

$w$  = individual wealth

## List of Acronyms

*BancoSol* = Banco Solidario

*FINCA* = Foundation for International Community Development

*MAD* = Moroccan dirham (currency of Morocco)

*MFI* = Microfinance Institutions

*MNT* = Mongolian Tugrik (currency of Mongolia)

*RCT* = Randomized Control Trials



# 1 Introduction

Credit serves a vital purpose for poor households. It is required to finance working capital and the capital required for new startups, and, when income streams fluctuate (for example because of a sudden crop failure or illness), it is an important instrument to smooth out consumption (Ray, 1998, p. 531). To say that a well-functioning financial system is central to the functioning of an economy is therefore platitude. As Demirguc-Kunt & Levine (2009; p. 2) points out, “The financial system influences who can start a business and who cannot, who can pay for education and who cannot, who can attempt to realize one’s economic aspirations and who cannot.” But the gaps in financial access are substantial. A study carried out in rural India showed that 87 percent of the poorest households did not have access to credit, 71 percent did not have formal savings accounts, and practically none had insurance (Basu, 2006). Demirguc-Kunt & Klapper (2012) estimate that the number of adults worldwide without formal bank accounts is approximately 2.5 billion, a majority of which live in developing countries. Thus, an inclusive financial system can improve the lives of many people, in particular those of the poor.

Throughout history, poverty has predominantly been – and continues to be – a rural and agricultural phenomenon (Decron, 2009), and as low-income countries attempted to develop their agricultural sectors after World War II, rural credit markets became the center of many government interventions (Morduch & Armendariz, 2005; p. 8). The results from these interventions, however, were largely disappointing, and in the wake of the failure of these government driven policies, old debates – about whether the poor are reliable borrowers, or whether they are too poor to save – emerged again. The argument, as it goes, is that banks and insurance companies simply cannot make a reasonable profit by dealing in very small amounts of money.

The recent success of the Grameen Bank, and other microfinance institutions (MFIs), has changed the terms of the debates. Taken together, MFIs deliver credit to about 200 million people worldwide and reported repayments rates exceeds 98 percent despite the fact that most borrowers are poor and lack acceptable collateral to offer as security for loans (Microcredit Summit Campaign, 2014). In India, the average interest rate paid by borrowers to moneylenders in the slums of Hyderabad was about 4 percent per month before microcredit showed up, profitably charging less than 2 percent per month (Banerjee & Duflo, 2010). How

is it that MFIs have managed to provide credit at substantial lower rates than moneylenders and how did they do it without losing control of default?

The aim of this dissertation is to review the literature on this issue. In doing so it will have to do two things. First, in order to think about how microfinance succeeded giving access to credit to the poor, it will have to explain why the credit market failed to do so in the first place. The task is therefore twofold. Second, it will have to respect a major constraint; the shortage of space. While microcredit and microfinance once were used interchangeably, microfinance today refers to a broader set of services, including savings and insurance, which all are important to the poor in their ways. Focusing on them all would be beyond the scope of this dissertation, it will therefore not attempt to go beyond the credit side except in passing [see for example Rutherford & Arora (2009) and Johnston & Morduch (2007) on savings, Decron (2004) on insurance and Karlan & Morduch (2009) for an overview of microfinance]. In addition, microcredit has for many become synonymous with group lending, as made famous by Bangladesh's Grameen Bank and Bolivia's BancoSol. However, group lending refers to a special kind of arrangement in which individuals without collateral come together and form groups to obtain loans from a lender, and if one member fails to repay, the whole group face consequences (Morduch, 1999). This dissertation is limited to study this methodology but it should be noted that microcredit goes beyond group lending (see Armendariz & Morduch, 2000). The Opportunity International, a leading microfinance provider in Eastern Europe, for example, have embraced individual lending as a core component of microlending to the less poor, and both the Grameen Bank and BancoSol have abandoned group lending for their wealthier and more-established borrowers (Armendariz & Morduch, 2000). Finally, although the aim of the dissertation is to answer the question raised above, it aims to do so within the historical context in which microcredit emerged and up to date. Section 2 establishes this context. While it will give a brief overview of the main ideas and arguments, there is insufficient space to do proper justice to every idea or author. For more technical aspects of the work, and more comprehensive discussions, the reader must look to the original sources.

The success of many microcredit programs around the world has been credited to group lending. The joint liability feature included in most loan contracts attracted a lot of attention from theorists in the 1990s, who were interested in the repayment incentives induced by the clause [see for example Holmstrom & Milgrom (1990), Varian (1990) and Arnott & Stiglitz (1991)]. The main advantage is that it solves the problem of asymmetric information because



it gives group members incentives to enforce the repayments of loans and thus reduces the transaction costs for lenders (Ghatak & Guinnane, 1999). In theory, group liability can therefore lead to higher repayment because group members have better information about each other's types [see for example Ghatak (1999, 2000) and Armendariz & Gollier (2000)], and because they are in a better position to both monitor what other members do with the loan [see for example Stiglitz (1990) and Laffont & Rey (2000)] and to verify default. In the case of the latter, a member who strategically tries to default may incur the wrath of other members who can impose social sanctions (Besley & Coate, 1995).

Yet, although the theoretical work has flourished, the empirical evidence have been somewhat thin. Fortunately, the last decade have seen tremendous progress in the area through the incorporation of randomized control trials (RCTs). These are like drug trials for economics. Subjects – individuals or entire villages – are at random assigned to different “treatments” – different programs or different versions of the same program – and because these subjects are exactly comparable, any difference between them can be attributed to the treatment (Banerjee & Duflo, 2011; p. 14). This has allowed economists to look beyond repayment rates to evaluate the success of group lending. Moreover, it has placed the discretion and decisions of the poor themselves in the main focus of attention.

The organization of the reminder of this dissertation is as follows. Section 2 establishes the historical context of the dissertation. Section 3 discusses market failures in the credit market and lists some features of rural credit markets that hinder access to credit. Section 4 presents some facts about the rural credit markets and presents a simple supply-side model which provides a useful framework to think about the empirical literature discussed later on. Section 5 discusses how the group-lending methodology have reduced the costs of providing small loans. Section 6 discusses the current evidence on the impact of microcredit, while section 7 concludes.

## **2 Historical Background**

Rural credit markets in developing countries have been subject to many policy interventions since the 1950s. The main argument was that rural credit markets did not seem to work as classical competitive markets were supposed to do. Borrowers often paid usurious interest rates, sometimes one could not obtain credit at any price, and village moneylenders usually dominated the market (Herath, 1994). Many people attributed the high rates of interest to the

monopoly power of lenders and the policy response to this view was to provide cheap institutional credit as an alternative to the moneylenders (Hoff & Stiglitz, 1990).

These interventions came in many forms. Chief among them was government ownership of banks (Besley, 1994). India nationalized their major banks in 1969, for example, and Mexico did the same thirteen years later. Hence, their governments could impel its banks to set up branches in rural regions and lend to farmers. Similar obligations were imposed on commercial banks in other countries, for example Nigeria (Okorie, 1990). Others again chose straightforward subsidization of credit, among them the Philippines (World Bank, 1986). In any case, the hope was that cheap credit would induce poor farmers to irrigate, apply fertilizers, and to adopt new crop varieties and technologies, and that this would lead to increased agricultural production (Morduch & Armendariz, 2005; p. 8).

It is generally agreed that the results from these policies have been disappointing. McKinnon (1973) blamed them for creating financial repression, and the Ohio State University group criticized them for mistakenly believing that policymakers could direct credit towards particular ends (like fertilizer or better seeds) [see Adams et al. (1984)]. They pointed out that credit was not an input in the production process, but a fungible product of financial intermediation. Thus, if an environment discourages increased agricultural production, for instance through price controls, there is no reason for farmers to use cheap credit to invest in agricultural improvements.

Furthermore, the group pointed to two aspects of many state-sponsored loan programs. First, default rates were typically high. Braverman & Guasch (1986) report that, with a few exceptions, they ranged between 40 and 95 percent. At such rates, it was impossible for banks to be self-financing. Recurrent and often large injections of governments fund was therefore required (Hoff & Stiglitz, 1990). Second, many programs failed in reaching the poorest farmers. Several studies showed that the lion's share went to the wealthier and more politically powerful farmers [Adams et al. (1984) and Von Pischke et al. (1983)]. In fact, this misallocation of resources was so common that Gonzalez-Vega (1984) dubbed it the "Iron Law of Interest-Rate Restrictions." Consequently, moneylenders continued to thrive and the interest rates charged remained high [Hoff & Stiglitz (1990), Bell (1990), and Siamwalla et al. (1990)].

To some people, however, the apparent failure of state sponsored loan program did not come as a surprise [see Stigler (1967)]. This people did not believe that the high interest rates were

due to the monopoly power of lenders, but because the market accounted for risk of default. Thus, they believed that the rural credit markets worked as classical competitive markets were supposed to do, and their recommendation of policy was to leave it alone. Hence, the 1980s saw a large-scale privatization of the financial sector and deregulation of interest rates (Conning & Udry, 2007). Many had given up hope on giving credit to the poor and being repaid when microcredit appeared itself as a silver bullet.

In 1972, Muhammad Yunus, a Bangladeshi professor in economics, returned to Bangladesh from the United States with his doctorate from Vanderbilt University (Rahman, 2001; p. 4). He arrived in a country facing great challenges. Independence from Pakistan was just won after a fierce war, and in 1974 a widespread flooding caused a famine that killed countless of people (Sobhan, 1979). In addition, over 80 percent of the population lived in poverty (Morduch & Armendariz, 2005; p. 11). Responding to these conditions, Yunus launched the Grameen Project in 1976 – an action research project to examine whether poor people, deemed unworthy of credit by commercial banks, when supplied with working capital could generate productive microenterprises (Hossain, 1988; p. 9).

By the end of 1983, Yunus had transformed the Grameen Project into the Grameen Bank; an institution that made small loans particularly to poor women, reaching more than one million people in 1991 (Morduch & Armendariz, 2005; p. 12). Microfinance institutions have since spread all over the world in an impressive pace: From 618 institutions serving 13.5 million clients in 1997 to more than 3300 institutions providing credit to 133 million clients in 2006 (Microcredit Summit Campaign, 2007). Microcredit had some fantastic years, by many considered the best way to alleviate poverty, and in 2006 Muhammad Yunus and the Grameen Bank jointly received the Nobel Peace Prize “for their efforts to create economic and social development from below” (The Nobel Peace Prize, 2006). In recent years, however, microcredit has been in the eye of the storm.

A November 2010 article in *The New York Times*, which appeared after local politicians in the Indian state of Andhra Pradesh blamed a number of suicides on harassment by microfinance debt collectors, quoted Reddy Subrahmanyam accusing microfinance companies of making “hyperprofits off the poor.” Subrahmanyam argues that the industry is no better than the village loan sharks it was intended to replace; “The moneylender lives in the community. At least you can burn down his house. With these companies, it is loot and scoot” (Polgreen & Bajaj, 2010). But it was not only in India the industry was under attack. In Latin-America, the ‘No Pago’ movement brought traffic to a standstill for ten miles in protest

against microfinance institutions, accusing them for charging excessive interest rates, “leaving borrowers swamped in unmanageable debt” (Pachico, n.d.). And in Bangladesh, Prime Minister Sheikh Hasina Wajed railed against Grameen bank founder Mohammad Yunus. She accused the industry of “sucking blood” of poor people (Financial Times, 2010). Once hailed as the ultimate cure for world poverty, microcredit no longer seemed to be the silver bullet it appeared to be.

### **3 Why the Credit Market Fails for the Poor**

The market for credit, like all other markets, consists of supply and demand. Working capital, fixed capital and shortfalls in consumption represent demand and savings represents the supply. The interest rate is the price borrowers have to pay for gaining the ability to spend money today, instead of waiting until their savings have accumulated into the sum required to finance some expenditure need. Alternatively, it is compensation to lenders for postponing their consumption.

In a perfectly competitive credit market, the rate of interest is determined through supply and demand: if demand exceeds supply, prices will rise, which in turn decreases demand and/or increases supply until the market clears (supply equals demand). In the absence of externalities, the first fundamental theorem of welfare economics states that the resulting allocation of resources in the economy is Pareto efficient. That is, there is no way to make one person better off without making some other person worse off. In equilibrium, the price system has coordinated the activities of the market participants in such a way that all resources are devoted to their highest-valued uses [see for example Crampton (2007; p. 983). In other words, those with the best investment opportunities would be able to borrow because they are the ones willing to pay the highest interest rates. However, as Besley (1994; p. 29) points out; “waters are muddied in credit markets”.

#### **3.1 Imperfect Information and Limited Liability**

In the case of a loan, the act of ‘buying’ and the act of ‘paying up’ is separated in time – money is advanced and must be repaid later – and this makes repayment an issue (Ray, 1998; p. 226). In fact, an agency problem occurs. Lenders, whether those are private banks or moneylenders, are usually in the business to make money, and can only do so if they are being repaid. But when the time comes, the borrower may be unable to repay or not find it in his or her best interest to do so. Lenders, therefore, must take actions to make it more likely that the

promises of repayment are fulfilled. The agency problem here refers to the following three observations (Hoff & Stiglitz, 1990):

1. *Borrowers differ in their likelihood to default, and it is costly for the lender to determine the characteristics of each borrower.*

Hoff & Stiglitz call this the screening problem. Before the loan is extended, the lender may have little information about the ‘quality’ of the borrower. Hence, a background check may be necessary to obtain the necessary information required to prevent the lender from mistakenly extending a loan to a ‘low quality’ borrower without properly accounting for the risk involved (Morduch & Armendariz, 2005; p. 35).

2. *It is costly for the lender to ensure that the borrowers take those actions which make them most likely to repay.*

This is what Hoff & Stiglitz call the incentive problem. It is difficult to monitor exactly what the borrower do with the loan. Hence, lenders worry that borrowers will not devote the required effort to make their investments successful, which makes it necessary for the loan officer to follow-up the loan.

3. *It is costly to enforce repayment.*

Finally, Hoff & Stiglitz refer to this as the enforcement problem. When the project is over and returns are realized, the borrower may declare default and the lender does not know whether this is true or not. The borrower may just want to ‘take the money and run.’ Hence, the lender incurs some cost to verify the default. The problem also occurs when the lender after having observed the returns cannot enforce repayment (Morduch & Armendariz, 2005; p. 46).

What these three observations above make apparent is that the credit market suffers from significant asymmetric problems: The borrower knows considerably more about the riskiness of the project for which he or she seeks funding than the lender does, and, in addition, a lot more about their willingness to devote effort to bring the project to successful completion (Campbell, 2006; p. 272). Economists refer to the former as a hidden characteristic problem and to the latter two as a problem of hidden action. In their seminal paper, Stiglitz & Weiss (1981) show that in the presence of asymmetric information, the lender may choose not to raise interest rates when the demand for credit exceeds the supply: An increase in the interest rate can lead the less risky borrowers to not take a loan (because they are most discouraged from borrowing when interest rates rise), which in turn leads to a more risky pool of loan applicants, and thereby lowers the lender’s profit. Similarly, a higher rate of interest decreases

the return on the projects which succeed, and this may induce borrowers to take on more risky projects where the payoff with success is greater. Thus, beyond a certain point, the lender may choose to ration access to credit at a lower interest rate rather than raising it further, even though there is excess demand.

The problem is that there is an asymmetry in the return to the lender as well. If the projects is unsuccessful, the lender will not get repaid, at best only receive a fraction of the borrowed amount. On the other hand, even though the project is very successful, the lender will not be paid back more than the amount of the loan plus interest. Limited liability favors the borrower in both cases, and it forces the lender to worry about default (Campbell, 2006; p. 272).

### **3.2 Features of Rural Credit Markets that Hinder Access to Credit**

#### **3.2.1 Lack of Collateral and Rule of Law**

One result of these difficulties is that lenders usually require borrowers to put collateral for loan repayment. Ray (1998; p. 268) identifies two reason why collateral is charged. First, collateral is an insurance if the project to which funds are sought genuinely turns out to be unsuccessful. Second, and more importantly, collateral is charged to prevent the borrower from walking away without repaying the loan. The problem is that adequate collateral are the one thing the poor always lack. Hence, they are denied loans. A key word here is *adequate*. The problem is not that poor peasants lack collateral, but that the collateral they have to offer are not in forms that formal institutions are willing to accept. Ray (1998; p. 534) illustrates this with a farmer who has a small quantity of land that he is willing to mortgage, but a bank may find it too costly to sell the land in the event of default and therefore rejects the offer. On the other side, what formal lenders view as unacceptable collateral, may indeed be acceptable to a lender of the informal kind (e.g. friends and relatives, moneylenders etc.). Thus, a local moneylender may be interested in the poor farmer's land or accept him to work off the loan, something no bank would take. Coupled with the fact that informal lenders often has better information about who the borrower is and what he or she does with the loan, there is no surprise that informal lending dominates in the developing world (see section 4.1).

It has been suggested that improving property rights and the legal system that enforce those rights would make it easier for the poor to offer collateral, and thus improve the working of credit markets in developing countries. De Soto (2000) argues that the difference between the West and the developing world is not that we have televisions and they have not or that we have mobile phones and they have not, but indeed that we have legally enforceable



transactions and property rights and they have not. His estimations are that there is \$9.3 trillion in ‘dead capital’ globally. That is, the value of the assets the poor and middle-class people in emerging economies poses that cannot easily be bought, sold, or used as an investment. These assets are held in defective forms, like houses built on land whose ownership rights are not adequately recorded. De Soto (2004; p. 174) writes:

*With titles, shares and property laws, people could suddenly go beyond looking at their assets as they are (houses used for shelter) to thinking about what they could be (security for credit to start or expand a business).*

Actions have been taken to improve property rights in many countries in the developing world [a wide literature study theirs impacts of different kinds, including Alston et al. (1996) in Brasil, Deininger & Chamorro (2004) and Foltz et al. (2000) in Nicaragua, Torero & Field (2005) in Peru, Brasselle et al. (2002) in Burkina Faso, and Deininger et al. (2006) in Uganda]. Byamugisha (1999) found that land titling in Thailand had a significant positive effect on financial development and economic growth. Economic growth responded to land registration following a J – curve: First it fell, then it gradually recovered before it finally posted a long, strong rally. It is, however, debatable whether all the effects brought about by those actions are indeed desirable. Attwood (1990) points out that it put pressure on the laws and customs that earlier assured farmer’s land rights, and that this could lead to an uncertain climate with consequently undesirable effects on both equitable land access and agricultural output. Moreover, Steel et al. (1997; p. 822) find in their surveys of Ghana, Malawi, Nigeria, and Tanzania that it was “much easier for a landlord-lender to make productive use of a pledged farmland indefinitely than for a bank to seize it.” Thus, even with improved property rights there may be some difficulties for formal lenders to seize assets. In the case of microcredit, it is particularly problematic to take resources away from the poor as it clearly clash with the objective that many microfinance banks have in common, to reduce poverty. Still, a central point remains. A borrower will only fulfill the promise of repayment if the costs of default exceed the benefits. But without a sound legal system, these costs are likely to be low and trade will therefore be limited to those derived from personal exchange, trade among people who know each other or at least about each other [see Gwartney & Lawson (2006) for a general discussion]. Family ties and social pressure replace the rule of law as mean for contract enforcement, in which case formal banks come out short.

### **3.2.2 Inherent Risk of Agriculture**

A special feature with agriculture is the risk for income shocks. The uncertainties inherent in weather, pests, growth process of crops and livestock, price of commodities and inputs, and other factors that impact farming can cause wide swings in income [see for example USDA (2014)], which in turn affect the ability to repay. Therefore, lenders will either not make loans or decide to do so only in small amounts, and at high interest rates.

Although one cannot control the weather, irrigation, for example, could reduce the uncertainty introduced by the erratic pattern of rainfall. Indeed, irrigation could enable multiple cropping. Seasonal shortfalls in food supply could thus be smoothened, and a more varied and nutritious diet could be achieved through the production of new crops (FAO, 2004). Hence, irrigation could improve the livelihoods of many rural households [irrigation could have some negative impacts on rural households as well; see (FAO, 2003)]. However, because farmers are poor, and therefore unable to borrow, and capital is short in supply, irrigation is not very widespread (Ray, 1998; p. 350). In Asia, where governments and international agencies responded to the major famines of the 1960-1970s with a large-scale investment in agriculture, 37 percent of the cropland was irrigated as of 2005 (Burney et al., 2013). By contrast, only 4 percent of agricultural land was irrigated in sub-Saharan Africa (Burney et al., 2013). The vast majority of which was concentrated in just four countries: Madagascar, Nigeria, South Africa, and Sudan.

### **3.2.3 Underdeveloped Complementary Institutions**

Illiteracy among borrowers, weak communication, and poorly developed networks of transportation contributes to the operating costs of lenders (Besley, 1994). In addition, complementary markets, like insurance, may be missing. If farmers could insure their health, their cattle, or their harvest, for example, default might be less of a problem. But insurance markets suffer from the similar sort of complications as credit markets do, although repayment is not the main issue (Ray, 1998; p. 530). Consider crop insurance for instance. Farmers with insurance coverage would have diminished incentives to devote the required effort to make a good harvest as likely as possible, because they know that they would not bear the full consequences of a bad crop. Of course, external circumstances, such as a pest, could lead to a bad harvest, but it would be no way for a large insurance company to observe the farmer's devotion of effort to keep pests away. In fact, it would be difficult to observe if there was a pest at all. Thus in most cases, such an insurance contract cannot be written with a large insurance company, especially without a reliable legal system to enforce contracts.

### 3.2.4 Covariant Risk and Segmented Markets

Because of weak communications, distant lenders rarely operates in rural areas. There are informal sources, like local moneylenders, but they only lend to locals because those are the only ones that they know well (the cost of lending is low). Nevertheless, Besley (1994) identifies a big disadvantage herewith. Many shocks, such as bad weather or a sharp decrease in the price of the main crop, affects everyone in a village at the same time. The consequences of such shocks are that many people are unable to repay at the same time and thus that moneylenders lose money. In other words, rural credit markets are segmented. Therefore, because moneylenders worry about ‘covariant shocks’, they do not lend out large amounts. A well-diversified loan portfolio could avert the covariant risk. However, while local lenders may have better information about potential borrowers, and better means to enforce contract, it is usually larger, national banks that have the better access to well-diversified portfolios of loans (Besley, 1994).

### 3.3 The Vicious Cycle of Poverty

The arguments above suggest that credit market imperfections and institutional failure acts as barriers to adoption of the most productive technology and techniques. Azariadis & Stachurski (2005; p. 300) writes:

*Collateral is needed to borrow funds. Funds are needed to take advantage of economic opportunities – particularly those involving fixed costs. The ability to take advantage of opportunities determines income; and through income is determined the individual’s wealth, and hence their ability to provide collateral. Thus the poor lack access to credit markets, which is in turn the cause of their own poverty.*

In other words, poverty begets poverty. The idea that imperfect credit markets can lead to a poverty trap can be found in Galor & Zeira (1993) [and Banerjee & Newman (1993, 1994)]. More specifically, Galor & Zeira (1993) demonstrates that in the presence of credit market imperfections, the distribution of wealth has a long-run effect on investment in human capital, aggregate income, and economic development. They present a model in which a single good can be produced by either a skill-intensive or an unskilled-intensive process, where skilled workers are more productive. Each individual has one parent and one child, and live for two periods. In the first period they may either undertake an indivisible investment in human capital and acquire education, or they can work as an unskilled worker. In the second they work as skilled or unskilled, according to their decision made in the first. Furthermore, they

consume only in the second period and leaves bequest for their children. There are three potential outcomes for an individual: (i) the individual inherits an amount larger than the cost of education. He or she invests in education and becomes a lender; (ii) the individual inherits an amount lower than the cost of education, but finds it profitable to become a borrower and invest in human capital; (iii) the inheritance is much lower than the cost of education. The individual finds it therefore unprofitable to borrow money and thus does not invest in human capital. Consequently, only individuals with sufficiently high initial wealth are able to take education. Galor & Zeira (1993) shows that in the long run there are rich dynasties, in which all generations invest in human capital, work as skilled, and leave a large bequest to their children, and there are poor dynasties in which people inherit less, become unskilled workers, and leave less to their descendants (they can be trapped in poverty). The initial wealth distribution determines the size of each group of dynasties and therefore aggregate income in the economy. The point is that credit market imperfections do not only affect at the micro level, it can have macroeconomic implications as well.

## **4 Rural Credit Markets: Some Facts and Theoretical Explanations**

### **4.1 Some Facts**

The lack of collateral does not mean that poor households are unable to borrow but very few do so from formal sources, such as commercial banks. Banerjee & Duflo (2011) report on extensive data collected from surveys in eighteen developing countries on this subject. A survey in Udaipur, in rural India, found that 66.5 percent of rural households living on \$1 per day had a loan. Of these 37.1 percent came from a shopkeeper, 21.5 percent from relatives, 16.9 percent from a moneylender, and only 5.9 percent were from a formal bank. As the authors point out, the lack of physical access to banks cannot be the only reason why the fraction on loans from banks is so low because they find a similar pattern in urban Hyderabad surveying households living on \$2 per day. Here 68.9 percent of the households had a loan, primarily borrowing from moneylenders (51.4 percent), friends and fellow villagers (26 percent), and relatives (12.6 percent). Only 4.5 percent of the loans were provided by a formal bank. And the pattern repeats itself throughout the dataset. Taken together, less than 5 percent of the rural poor households, and less than 10 percent of the urban poor households had a loan from a bank. Over time, a large body of literature has evolved describing informal credit

markets in developing countries. Banerjee (2001) provides a useful review of this literature and lists some salient features.

First, lending rates are very high. Banerjee & Duflo (2011; p. 157-158), for example, tells the story of fruit vendors in Chennai who pay an astronomical rate of almost 5 percent per day. In Pakistan, Aleem (1990) found that professional moneylenders in a semi-urban setting charged on average an annual interest rate of 78.65 percent. And in a study of “indigenous-style bankers” in India, Timberg & Aiyar (1984) report that Shikarpuri lenders charged interest rates as high as 120 percent per year. Furthermore, lending rates are higher than deposit rates. In Pakistan the spread is over 40 percent (Aleem, 1990) and in Timberg & Aiyar’s (1984) studies the gap tend to be around 16 percent.

Second, interest rates vary widely within the same economy (village or town). In Aleem’s (1990) study in Pakistan, the standard deviation of interest rates was 38.14 percent. Timberg & Aiyar (1984) report that the interest rates charged on loans by the Shikarpuri lenders varied between 21 and 37 percent for members of local associations, and between 21 and 120 percent for nonmembers. The Gujarati lenders, however, never charged rates above 18 percent. In Thailand, Onchan (1985) found that interest rates varied widely between different kinds of lenders. Suppliers of raw material appeared to charge the highest rates. In the silk industry, for example, interest rates were as high as 89 percent. Ghate (1992) cites a case study in Thailand that found that in the Central Plain, monthly interest rates were 2-3 percent, while in the north and the northeast, the rates of interest were 5-7 percent per month. In addition, Irfan et. al (1999) studied the structure of the informal credit market in Pakistan and report that interest rates ranged from 48-120 percent per year.

Third, rich borrow more and pay lower interest rates. In India, two Shikarpuris and one Rastogi lender said that they would not lend more than 25 percent of the borrower’s net worth. Another Shikarpuri set his limit at 33 percent (Timberg & Aiyar, 1984). Banerjee (2001) cites the following facets from the “Summary Report on Informal Credit Markets in India” by Das-Gupta (1989): (i) The average interest rate declines clearly with loan size; (ii) Landless borrowers paid interest rates ranging from 28-125 percent and cultivators “only” paid between 21 and 40 percent; and (iii), those with assets between 5 000 and 10 000 rupees paid an average rate of 120 percent whereas those who had more than 100 000 rupees paid 24 percent. In Udaipur, the average interest rate drops by 0.40 percent per month for each additional hectare of land owned by the borrower (Banerjee & Duflo, 2011; p. 160).

Fourth, default rates are low. Timberg & Aiyar (1984) report that the default rates of working funds for the Shikarpuris, Gujeratis, Chettiars', and Rastogis were respectively 1 percent, 0.5 percent, 1.5 percent, and 1.5 percent. Aleem (1990) reports of an average default rate of 2.7 percent in Pakistan, where twelve of fourteen moneylenders experienced a default rate of 5 percent or less.

Finally, the monopoly power of lenders does not appear to be the reason for high interest rates. High interest rates are most commonly reported from areas where numerous of lenders are available. Aleem (1990; p. 340), reports, "If lending is considered the primary activity, then the mean average cost for the group is virtually identical to the interest rate observed in the market." Moreover, various studies find no evidence of supernormal profits amongst informal lenders (Banerjee & Duflo, 2010).

## 4.2 A Simple Model of the Credit Market

Neither the lender's monopoly hypothesis nor the perfect market view can explain the features discussed above. Another explanation is, as stressed in section 3.1, that in the presence of asymmetric information, there is a cost for the lender to make sure that the loan is repaid. Banerjee & Duflo (2010) presents a model of the credit market that captures this idea. The following paragraphs present the model as Duflo (2011) puts it forward.

### 4.2.1 The Model

Suppose an individual with wealth  $w$  wants to invest an amount  $k > w$  in a business that yields a risk-free gross return of  $F(k)$ , where  $F'(k) > 0$  and  $F''(k) < 0$ . To do so the individual will need to borrow  $(k - w)$ . The lending sector is competitive and the gross interest rate is  $r$ . Hence, at the end of the period the individual is supposed to repay  $(k - w)r$ . However, after the returns are realized the individual can choose to default at a cost proportional to the sum invested (i.e. there is hidden action),  $\eta k$ . Thus, the individual's payoff depends on whether he or she chooses to repay or default. In the case of the former his or her payoff is  $F(k) - (k - w)r$ , and in the latter  $F(k) - \eta k$ . If the cost of default is lower than the interest payment, the borrower will always choose to default. The lender, therefore, sets  $k$  so that

$$F(k) - (k - w)r \geq F(k) - \eta k,$$

which gives



$$k \leq \frac{r}{r - \eta} w.$$

The lender will never lend more than this amount, because he or she knows that the borrower then will choose to default. The borrower, however, may want to borrow more. This is the case when the borrower borrows as much as he or she can but the total investment,  $k$ , is so that the marginal product of capital still is greater than the interest rate, that is  $F'(k) > r$ . When this is true, the borrower is credit constrained: he or she can only borrow up to some multiple of his or her own wealth. This, again, implies that richer individuals can borrow more. Notice that the amount one can borrow increases in the cost of default,  $\eta$ , but decreases in the interest rate,  $r$ . A higher interest rate creates a greater incentive to default, which requires the lender to restrain the borrower.

The cost of capital in the lending sector is  $\rho > \eta$  (otherwise the lender can always set  $r = \rho$ , in which case the borrower would never want to default). In addition, the bank has to pay a fixed cost,  $\phi$ , to make sure that the borrower does not default. This cost represents both the cost of gathering information about the borrower (where he or she lives, what he or she owns, what job he or she has etc.) and the cost of monitoring the borrower so he or she knows that default comes with a price. If the lender does not pay this cost, the cost of default to the borrower drops to zero and he or she will never choose to repay. Moreover, we assume that this cost is independent of the loan size. In a competitive equilibrium, the lenders do not make any economic profit. Hence,  $r$  is determined by the requirement that the lender's revenues equals his cost,

$$(k - w)r = (k - w)\rho + \phi.$$

But the borrower must still want to repay. Thus, the borrower's incentive constraint is

$$(k - w)r = \eta k$$

Combining the lender's zero profit condition and the borrower's incentive constraint gives

$$(k - w)\rho + \phi = \eta k,$$

which we can write as

$$k = \frac{\rho w - \phi}{\rho - \eta}.$$

The equation states that if  $\rho w < \phi$  the borrower will not be able to borrow at all,  $k$  is negative. Moreover,  $k$  is increasing in both wealth,  $w$ , and the cost of default,  $\eta$ . This may be the reason why some microfinance organizations (SafeSave is a case in point) seek to develop attractive ways for the poor to save: it is a way into borrowing as it helps them build wealth. Next, replacing  $k$  in the lender's zero profit condition yields the equilibrium interest rate

$$r = \rho + \frac{\phi(\rho - \eta)}{\eta w - \phi}.$$

The important property with this equation is the multiplier effect. The interest rate,  $r$ , increases more than proportionally with an increase in the cost of capital and the fixed administrative cost. In other words, if the cost of capital, or the fixed administrative cost, increases with one, the interest rate increases with more than one. The intuition is as follows: People with little wealth get smaller loans, however the lender cannot avoid the fixed cost of lending even if the loans are very small. Thus, the smaller the loan, the larger the fixed cost will be as a fraction of the loan's size, and because the interest rate has to cover the fixed lending cost, the higher the interest rate need to be. But higher interest rate makes the borrower more likely to default. Hence, the lender needs to screen and monitor the borrower more carefully. This adds to the cost of lending, which pushes the interest rate up further, which again makes the borrower more likely to default... The upward pressure feeds on itself, pushing the interest rates up until the loan is small enough and the interest rate high enough to cover the fixed administrative cost, or the lender decide not to grant the loan. As a result, small changes in wealth or the cost of lending can lead to a large change in the interest rate.

#### 4.2.2 Evaluating the Model

The model can explain the facts above. When borrowers are poor – have little wealth – there can be a large wedge between the lending rate,  $r$ , and the deposit rate,  $\rho$ . As the borrower becomes richer, the maximum amount he or she can invest ( $k$ ) increases, for two reasons: First, because the borrower has more collateral to offer; and second, lower interest rate allows the borrower to borrow more. At the same time, the poorest individuals will be excluded from the credit market. Furthermore, because formal institutions are located far from villages their fixed cost of lending is high, and they might have high variable costs as well. If they, additionally, face an interest rate ceiling, they may be unable to lend to the poor. Conversely, moneylenders are close to the people and may have better information about the people in the village – their fixed cost of lending is low. Moreover, they may be able to impose serious damage on the person who tries to default. A credible threat of broken kneecaps, for example,

makes the cost of default,  $\eta$ , higher, which through the multiplier effect leads to lower interest rates. However, the cost of capital will be high for moneylenders, so the interest rate they charge will also be high. Notice that this model does not explain default.

The last fact in subsection 3.2.2 was that monopoly power of lenders did not seem to be the reason for high interest rates. Yet, it is not observed that people frequently change moneylender. The model suggests that even though there is ex-ante competition, there can be ex-post lock in. The borrower can freely choose from which moneylender he would like to borrow, but once the lender has paid the fixed cost of getting to know the borrower, it becomes costly to switch. In addition, because the moneylenders know that it is costly to switch, they would become suspicious if the borrower wanted to do so (they fear that he or she may be a risky borrower). Thus, once the borrower has chosen his or her moneylender, he or she may not be able to switch, and, as a result, the borrower's moneylender can exploit this and charge a higher interest rate.

The next section explains group lending and analyze within the framework developed here to see how it, from the standpoint of economic theory, addressed the problems of asymmetric information raised in section 3.1.1. In addition, it points to some empirical literature on the issue.

## **5 Microcredit: Reducing the Costs of Lending**

### **5.1 Group Lending**

The group-lending model became very famous after Muhammad Yunus applied it in the Grameen Bank. He describes the beginning as follows (Yunus, 2010; p. viii):

*Back in the early seventies, the newly independent country of Bangladesh was in a terrible state. The aftermath of our War of Liberation – with the destruction caused by the Pakistani army – combined with floods, droughts, and monsoons to create a desperate situation for millions of people. Then came the famine. I found it increasingly difficult to teach elegant theories of economics in the classroom while a terrible famine was raging outside. Suddenly I felt emptiness of traditional economic concepts in the face of crushing hunger and poverty. I realized that I had to be with the distressed people of Jobra, the neighboring village just outside Chittagong University, and somehow find something to do for them. All that I hoped to do was make myself useful to at least one person per day.*

Yunus found that most villagers were unable to obtain loans from conventional banks and therefore had to rely on local moneylenders for credit. The small size of the loans and the high interest rate they carried (10 percent per week) made it impossible for the poor to improve their standards of living and to accumulate capital on their own (Yunus, 2010). So from his own pocket, Yunus lent the equivalent of \$27 to forty-two people, roughly 64 cents to each, which allowed them to buy materials for projects like crafting stools of bamboo (Yunus, 2010). Ten years later, Yunus had succeeded in creating the Grameen Bank. Looking to informal financial institutions (such as rotating savings and credit associations and credit cooperative), Yunus and his associates found that by requiring their borrowers to organize themselves into groups, one could reduce the costs of screening potential borrowers, monitoring loans, and enforcing repayment substantially.

The Grameen Bank developed a system in which groups of five are formed voluntarily. Loans are made individually but, according to the rules, if one member defaults, the whole group is denied subsequent loans. The system follows a 2:2:1 staggering. The bank lends first to two, then to the next two, and finally to the fifth, which is the group chairperson (Morduch, 1999). Repayments usually begins just a week after the loan was given and continue weekly after that (Morduch & Armendariz, 2005; p. 13). People who repay their loans on time can take larger ones in the future (The New York Times, 1997). The groups of five are organized into ‘centers’, with eight groups to a center, which meet weekly in the local community with a loan officer to make loan repayments, make deposits, and to discuss their business plans (Morduch & Armendariz, 2005; p. 85). Borrowers also commit to boil their water, keep their families small, and to take care of their health (The New York Times, 1997). In 2011, the Grameen Bank had over 8.3 million borrowers, 97 percent of whom were women (Grameen Bank, 2011).

Banco Solidario (BacoSol) of Boliva also lends to groups yet it differs from the Grameen Bank in many ways (see Morduch. 1999). In the case of group lending, BancoSol take use of solidarity groups, each of which can have four to ten members (Prescott, 1997). The group takes a loan from the bank and distributes among its member, thus loans are made to all group members simultaneously (Prescott, 1997). Repayments schedules are flexible. Some borrowers make frequent repayments, every week or two, while others do so monthly (Morduch, 1999). As in the Grameen groups, the whole group is responsible for loan repayment. Half of BancoSol’s clients are women (Accion, 2014), but most borrowers are located in urban areas (Accion, 2005). Nevertheless, because the bank requires all members of

the solidarity group to work within a few blocks of each other, borrowers still have good information about each other (Prescott, 1997).

A third approach is found in the “village banks”, operated by microlenders in many countries throughout Africa, Latin America and Asia (Morduch & Armendariz, 2005; p. 85). Karlan (2007) describes the Foundation for International Community Assistance (FINCA) in Peru. Here lending groups are neither formed by members selecting each other nor are they neighborhood based. Instead, individuals who seek loan come to FINCA’s office and their names are put on a list. When the list contains thirty names, a group is formed. Group meetings do not take place in the local neighborhood, but in the FINCA office in the city centre. This allows the group to have members from all over the city. However, a consequence is that the members of each group do not necessarily know each other beforehand. This is a downside. Karlan (2003; p. F54) found that “Individuals who live closer to one another and are more culturally similar to others in the group are more likely to repay their loans and save more,” and continues, “There are many reasons to believe that this is a result of their ability to better monitor and enforce the loans.”

## **5.2 Taking Stock: How Microcredit Reduced the Costs of Lending**

### **5.2.1 Group Liability**

#### **5.2.1.1 *Mitigating the Screening Problem***

The screening problem occurs because it is difficult for the lenders to distinguish the safe type of borrowers from the risky type. If lenders could distinguish the types, they could price discriminate borrowers – charging lower interest rates from the safe types and higher rates of interest from the risky types. To determine the characteristics of each borrower, lenders therefore screen their applicants before extending loans. But this imposes a cost upon the lender and without a reliable system of communication among lenders that can keep track of individual credit histories this cost may be very high indeed.

When groups are formed voluntarily and face a joint liability contract, borrowers will clearly be better off grouped with safe types rather than risky types. Borrowers therefore have an incentive to use the information base inherent in the local community to find the best partners. The resulting outcome is that safe borrowers stick together on the one side, and risky borrowers group together on the other side – commonly referred to as assortative matching. Thus, the lender is able to price discriminate and charge higher interest rates from the risky

group of borrowers, and the screening job was done by the borrowers themselves – which reduces the administrative costs.

#### ***5.2.1.2 Mitigating the Incentive Problem***

The incentive problem occurs because lenders worry about what borrowers do with the loan. Lenders therefore monitor their borrowers to ensure that they take those actions which make them most likely to repay, and this adds to the cost of lending.

When each member of the group is liable for the loans of the other members, it obviously matters what their peers do with their loans. The joint liability contract therefore gives an incentive to monitor what fellow group members do with their loans, which eases the burden of lenders and lowers their administrative costs. Moreover, members are able to inflict social sanctions on anyone who devotes little effort to their project and thereby incurs excessive risk on the group. Thus, the cost of default can potentially be large.

#### ***5.2.1.3 Mitigating the Enforcement Problem***

The enforcement problem arises after returns are realized. The problem is that borrowers may be tempted to declare default even though they have the money to pay. Thus, the lender incurs some cost to verify the default. The joint liability contract can transfer this cost to the other members of the group, for whom the cost are likely to be less for in the first place. Because they are the ones who have to pay in case of default, they have an incentive to check whether the declared default is true or not, and they are in a better position to do so. This is what Stiglitz (1990; p. 351) refers to as peer monitoring: “having neighbors who are in a good position to monitor the borrower be required to pay a penalty if the borrower goes bankrupt”. Again, because members can impose social sanctions on a member who tries to strategically default, default costs may be high.

#### ***5.2.1.4 A Note on the Empirics***

Banerjee (2013) surveys the empirical evidence on the effects of group liability. He writes that despite extremely creative research designs, there have not yet been produced definite results either for or against it, partly due to the “inherent difficulties of designing the right experiment and implementing it in a realistic setting” (p. 497). Banerjee (2013) cites a study by Giné et al. (2011) as the clearest evidence that group membership matters. In 2009, a Muslim community in the Kolar town in the state of Karnataka, India, banned all their members from repaying their microcredit loans claiming that it was forbidden to charge interest. In Kolar, many borrowers were members of several groups with different proportions



of Muslims. Thus, Hindus who were in groups with Muslims had a reason to default as well. Giné et al. (2011) found that Hindu households were more likely to default on its loans from Muslim-dominated groups. However, as Giné & Karlan (2014; p. 69) points out, “the strategic default could be driven by peer pressure rather than joint liability per se.”

The Giné & Karlan (2014) study is in itself interesting. They carried out an experiment in the Philippines to evaluate the efficacy of group liability relative to individual liability on the monitoring and enforcement of loans. In cooperation with the Green Bank of Caraga, they performed two RCTs. In the first, they randomly converted 80 group-lending centers to individual liability, although repayment was still performed in a group setting. Because the groups were formed before the “surprise” was announced, the monitoring effect was eliminated while the screening effect remained intact. In the second trial, some villagers were randomly assigned individual liability from the beginning, while weekly meetings remained. For the first trial, Giné & Karlan (2014) found no change in repayment for those centers converted individual liability. Nor were there any statistically or economically significant difference in repayment rates in the second trial. They note however that average loan sizes were smaller. Thus they cannot rule out the effects of the behavioral changes of the bank. Instead they point out that their results should be interpreted as the net effect of the behavioral responses of both the bank and the clients. Banerjee & Duflo (2010; p. 70) points out another aspect of the research worth mentioning; “Default rates are very low to start within this context, so that the other incentives that the microfinance institutions provided (like monitoring) may have been so effective that group liability was not needed. It remains possible that group liability would matter in contexts where there is otherwise a larger temptation to default.”

Moreover, one can find anecdotal evidence on the limits of joint liability in for example Woolcock (1999), Rahman (1999), Matin (1997) and Montgomery (1996). Montgomery (1996; p. 289) points out that it “can lead to forms of borrower discipline which are unnecessarily exclusionary, and which can contradict the broader (social) aims of solidarity group lending.” This is an important reminder, which is addressed further in section 6. Although group lending may lower the costs of lending for the bank one should not take it as given that access to credit outright improves the lives of poor people lacking collateral. Montgomery (1996) reminds that the ‘state’ of poverty rarely is stable and static. A borrower who experiences a short term crisis, like a sick spouse needing treatment, may suddenly shift from a safe type to a risky one if it makes him or her unable to meet his or hers obligations to

repay. Thus, he argues that although a group may be homogenous at a certain point in time, group homogeneity over time is unrealistic and this calls the way peer pressure works in practice into question. Montgomery (1996) reports from the case study BRAC's Rural Development Programme where bank staff, eager to keep up repayment rates, threatened to withdraw access to loans for villagers in general instead of the four other members who were jointly liable for the outstanding loan. And he demonstrates that the collective action against individual defaulting or lagging behind can be serve. In one dramatic case, a woman's house was pulled down because she failed to pay her housing loan. In contrast, Montgomery (1996) also refers to another case study in Sri Lanka where exclusion of poorer members because of repayment problems was rare. He attributes the success to a range of coping mechanisms offered by the institution, including flexible repayment scheduled, open access savings, and instant consumption loans, which "encourage a decreased perception of individual risk, encourage more mutual trust and support, and meet the practical needs of poorer people more effectively" (Montgomery, 1999; p. 303).

## **5.2.2 The Role of Dynamic Incentives and Frequent Meetings**

### **5.2.2.1 *Dynamic Incentives***

Most loan contract tends to offer dynamic incentives. That is, the incentives to repay are generated by a loan contract that gives access to larger loans in the future. Thus the idea is that the promise of a larger future loan ensures the current one (Banerjee, 2013). In other words, the costs of default increases. Banerjee (2013) cites Bulow & Rogoff (1989) who explored this idea theoretically within the context of sovereign debt and summarize their key point as, "A borrower can retain the money [principal plus interest rates] he or she would have repaid the lender and use it as the next loan. For repayment to dominate in this option, the rate of loan growth has to be higher than the interest rate" (p. 498). However, the standard growth rate of loans is substantially lower than the interest rate, which means that dynamic incentives cannot work alone (Banerjee, 2013).

Banerjee (2013) surveys the literature on this issue too. An experiment performed by Karlan & Zinman (2009) in South Africa, showed that dynamic incentives had a positive effect on repayment. Giné et al. (2010) set up an experimental economics laboratory in Peru, where they conducted a framed field experiment with microenterprise owners and employees. They report that because the costs of default increases when dynamic incentives is added to a loan contract, borrowers chose less risky projects and default decreased. Giné et al. (2012) performed an experiment in Malawi in which randomized loan applicants was fingerprinted

before getting a loan. This allowed the lender to withhold future loans from past defaulters, while they could reward borrowers who repaid with better loan contracts. They found that while fingerprinting had no impact on farmers predicted to have the lowest default risk, the repayment rates were substantially higher for the subgroup of borrowers who were predicted to have the highest risk of defaulting. This group represented one fifth of the borrowers and the reported repayment rates were 66.7 percent in the control group and 92.2 percent in the treatment group (the fingerprinted borrowers). Giné et al. (2012) conclude that this was partly because fingerprinting led farmers to choose smaller loans, and partly because they diverted fewer inputs away from the cash crops it was supposed to finance.

#### ***5.2.2.2 Repayment Frequency and Group Meetings***

The average loan size varies around the world from \$112 in Bangladesh (in 2009) to \$1 590 and \$1 926 in Peru and Bolivia respectively (in 2009) [Buera et al., 2014]. The standard loan usually has one year to maturity (Banerjee & Duflo, 2010) and as described above, repayments generally starts shortly after loan disbursement and in frequent installments. From the standpoint of economic theory, there could be advantages from tying the repayment to the revenues of the investment. A new crop, for example, does not generate income immediately after it is bought and planted. However, microcredit institutions tend to regard the fiscal discipline entailed by a rigid payment schedule as a key to avoid default, although it raises the transaction costs (Field & Pande, 2008). To study the effect of weekly repayments schedules, Field & Pande (2008) performed a field experiment in urban India. One hundred groups of first-time borrowers were randomly assigned to three classes: A third was assigned a normal repayment schedule with weekly repayments at weekly meetings; a third was assigned a monthly repayments at monthly meetings; and the final third was also assigned a monthly repayment schedule, but these groups were required to attend weekly meetings for the first three months and thereafter graduated to a monthly meeting schedule. The results showed that switching from weekly to monthly installments did not affect the repayment capacity of the first-time borrowers. Field & Pande (2008; p. 3) thus points out that “switching to lower frequency repayment schedules could allow MFIs [Microfinance Institutions] operating in comparable settings to save dramatically on the transaction costs of installment collection while facing virtually no added risk of default.”

Similarly, Field et al. (2011) offered randomly chosen clients a two-month grace period before repayments began. In this study, all contracts had individual liability and once repayment began, the repayment frequency was equal for all clients. The authors found that

those individuals receiving a grace-period were twice as likely to start a new business and invested more in their microenterprises than those receiving the regular contract. In addition, weekly business profits and monthly household income were, on average, respectively 33 and 18 percent higher for grace-period clients. However, these clients were also three times as likely to default on their loans. Field et al. (2011) also report that businesses ran by grace-period clients were more likely to extend credit to their customers and had a wider selection of products to offer. The authors conclude that their findings support the perception among microcredit practitioners that requiring repayment to begin at an early stage is indeed important to maintain low default rates among poor borrowers, but note at the same time that the default aversion of microcredit institutions may come at the cost of entrepreneurial activity.

Why loan repayments take place in group meetings are less discussed in the literature, but it has been brought into attention by Banerjee & Duflo (2010) and Banerjee (2013). It remains one of the most salient features of the transaction design of the biggest microcredit institutions, even when there is individual liability (Banerjee, 2013). One argument is that it helps to build social collateral and thereby reduce default (Banerjee & Duflo, 2010). The role of social collateral in microcredit was explored theoretically in an early paper by Besley & Coate (1995). The idea is that weekly meetings help clients to build ‘face-to-face-relations’ with each other and that the relationships that develop will make it easier to trust and monitor each other. In time, these relationships may be worth something on their own which makes clients either more willing to help out those in risk of defaulting or makes them ashamed about being displayed as a defaulter within the group (Banerjee & Duflo, 2010). This could indeed explain why the study carried out in the Philippines by Karlan & Giné (2014) found no change in repayments – weekly meetings continued although there was individual liability. Moreover, this could also explain why Karlan (2007) found that the people who lived closer to each other and people that were more culturally similar to others in the FINCA group saved more and were less likely to default. However, as Banerjee & Duflo (2010; p. 73) points out, “the group lending and rigid repayment structure that characterizes the microcredit model may actually be less important for incentive reasons than for what they require of the technology of loan collection.” Typically group leaders are in charge of collecting loan repayments from his or hers group members and are responsible for giving it to the loan officer. Thus the loan officer is able to carry out the loan transactions of a large number of borrowers in a short period of time, and this has reduced the administrative costs of providing small loans

significantly. Unfortunately, the writer of this dissertation is unaware of any studies that have attempted to quantify the amount of time the loan officer saves on this method.

## **6 The Impacts of Microcredit**

Banerjee et al. (2015) used RCTs to evaluate a group-lending microcredit program in Hyderabad, India, where 104 poor neighborhoods were surveyed over a period of 3 to 3.5 years. The study was carried out in collaboration with Spandana, one of India's fastest growing MFI's at the time, which in 2006 progressively opened up branches and began their operations in 52 randomly selected neighborhood. The first loans had a size of 10 000 rupees, or \$1 000 (in 2007 prices, adjusted for differences in purchasing power). If all group members repaid their loans, they were able to get another one, this time at the size of 10 000-12 000. About 18 months after the opening of the first offices, the authors conducted the first round of surveys, collecting data from 6 863 households and two years later, they surveyed the same households again. Their results suggest that the demand for microcredit is less than expected. The first round of surveys showed that only 26.7 percent of eligible households took out a loan, and by the end of the study, 67 percent did still not borrow from an MFI. Although most households do loan, they preferred to do so from other sources. The authors suggest that this could either be because most households do not have business projects with a rate of return of at least 24 percent, which the annual interest rate on a Spandana loan, or because these other sources – friends and relatives, moneylenders etc. – provides greater flexibility that is preferred at the costs of higher interest rates (from a moneylender) or the embarrassment of borrowing from a friend. Furthermore, Banerjee et al. (2015) find that for those households which received access to microcredit early: (i) monthly per capita consumption, an indicator for overall welfare, does not increase neither in the short run nor in the longer run; (ii) the average business remains small and not very profitable, and those businesses that do experience increased profits tend to be those which were most profitable in the first place; (iii) there is no perceptible effect on investments in children's human capital or on women's empowerment neither in the short run or in the longer run. Nevertheless, the authors do see that microcredit affects the structure of household consumption – they invested more in durable goods and reduced their consumption of “temptation goods” and expenditures on festivals and parties – and labor supply choices – households with access to credit seemed to devote more effort to their own businesses. Banerjee et al. (2015; p. 52) concludes:

*Microcredit plays its role as a financial product in an environment where access to both credit and saving opportunities is limited. It expands households' abilities to make different intertemporal choices, including business investment. The only mistake that the microcredit enthusiasts may have made is to overestimate the potential of businesses for the poor, both as a source for revenue and as means of empowerment for their female owners.*

Angelucci et al. (2015) conducted a similar study with Compartamos Banco, the largest microlender in Mexico. They report from 16 560 household surveys to estimate the impact of a group lending expansion in north-central Sonora, near the Arizona border. In their study, loan amounts ranged from 1 500-27 000 pesos (\$125-\$2250), with an average of 6 462 pesos (\$538.5). The results are much in line with those of Banerjee et al. (2015). The expansion led to a 6.9 percentage point increase in the likelihood of borrowing from any MFI with a control mean base of 13.8 percent. Households in treatment areas did grow their businesses but there was no corresponding effect on business profits, entry or exit. Nor were there any statistical significant effect on household income in treatment areas, but they did find that temptation purchases declined. However, opposed to Banerjee et al. (2015) there is evidence for a modest increase in female decision-making. The authors also report that increased access to microcredit decreased reliance and the need for aid in depressions.

With help from XacBank, the second largest microlender in Mongolia, Attanasio et al. (2015) provide evidence from a RCT carried out among 1 148 women in 40 villages across rural Mongolia. However, their study differs in three ways. First, it included individual loans as well as group loans. Second, both loan products required some form of collateral. Third, loans were intended to finance business creation. Regarding the final point, the authors observed that only half of the extended credit went to this purpose. The remaining half went to finance household consumption. First time borrowers were given a maximum loan size of MNT 500 000 (\$435). In terms of individual lending, Attanasio et al. (2015) do not document any poverty impacts nor an increase in enterprise ownership. In the terms of group lending, however, they find positive impacts on both. For households that were offered this loan contract the likelihood of owning an enterprise increased almost 10 percentage points more than in the control villagers (although they do not find that access to credit resulted in more profitable enterprises), and total food consumption was on average \$18.42 higher per household per month than for households in the control villages. The authors suggest that the joint-liability scheme might have been more effective raising consumption because it better



ensures discipline – that a larger part of the loan is actually invested in the first place. Attanasio et al. (2015) did not find any effect of access to credit on expenditures on durables, nonfood nondurables, and investment in children's human capital.

Crépon et al. (2015) report from a RCT introduced in rural areas of Morocco in collaboration with Al Amana, the largest MFI in the country. The study are unlike the others because it took place in areas where there did not exist any other MFIs prior to or after the introduction of the RCT. Hence, it could capture the impact on the most interested households in the villages. Over two years, more than 4 500 households in 162 villages were surveyed. Loan amounts ranged from MAD 1 000-15 000 (\$124-\$1 855) per member. The findings strengthen the evidence that the aggregate impact of microcredit is limited. About 17 percent of the households took out a loan in the treatment villages, of which only 50 percent took out a second loan. Access to credit led to a significant expansion in existing self-employment activities, primarily agriculture and animal husbandry, but it did not help to start up new activities. Those who expanded their businesses experienced, on average, an increase of profits of MAD 2 005 (248\$) but this effect seems to be very heterogeneous [as in Banerjee (2015)] and was offset by a significant decrease in employment income, stemming from a substantial decline in the labor supply outside the household. Taken together, total income and consumption did not change, but hours worked outside the home dropped. Additionally, households that get credit end up with a higher stock of assets, mainly consisting of cows or goats. The authors suggest that this could reflect business investment strategies, in which assets represent unrealized profits, or a self-insurance mechanism, in which they represents in-kind savings. In case of the latter, it could be a substitute for income diversification through day labor – another risk-management strategy. Finally, and similarly to the other studies, households reduced their nonessential expenditures (here festivals), but there were no effect on child education or female empowerment. Although on the latter, it should be noted that the majority of the sample's borrower were men so the expected effect is not as outlined as in programs lending to women. Overall, the authors (p. 127) conclude

*[...] some households choose to take advantage of microcredit to change, in pretty significant ways, the way their lives are organized. But even these borrowers do not appear to choose microcredit as a means to increase their standard of living, at least in the relatively short run.*

## 7 Conclusion

Microcredit, held up for decades as something of a “miracle cure” for world poverty, has in recent years been the subject of many controversies in many continents. But the debates have usually been grounded in anecdotes, with fruit sellers turning into fruit magnates on the one side and deeply indebted borrowers on the other, rather than hard evidence of the effect on the average borrower. This dissertation has tried to shed some light over these debates by reviewing some of the existing theoretical and empirical literature on microfinance and credit markets.

It took a twofold approach. It began with identifying informational constraints as the sources of inefficiency in the credit market and explained how this resulted in an agency problem. The informational gaps occurs at three levels. First, the lender does not know the “quality” of the borrower. Second, the lender does not know exactly what the borrower do with the loan. Third, the lender does not know whether the borrower will choose to repay when the loan comes to maturity. Lenders must therefore take actions to make it more likely that the promise of repayment is fulfilled. But these actions are costly and if the costs are too high, the lender will choose not to grant the loan. Most of the observed features of rural credit markets can be understood as the market’s responses to these informational problems.

The dissertation then went on to describe how the canonical model of microcredit – characterized by joint liability, dynamic incentives, group meetings and frequent repayments – by transferring risk from lenders to borrowers coupled with the benefits of the transaction design reduced the costs of providing small loans to the poor. Moreover, it brought a critical eye to the group-liability contract, pointing out that we still do not know whether it really matters and that the strong social pressure it exerts has the potential of making it onerous for borrowers.

In the end, it all boils down to one thing – what is the impact of microcredit? Until very recently, there was very little evidence on the question, apart from case studies, usually produced by the MFIs themselves. This dissertation reviewed some of the latest findings from RCTs conducted in India, Mexico, Mongolia, and Morocco. The evidence from these experiments indicate that the aggregate impact of microcredit is limited. Most studies see an increase in durables and business assets, but there is no strong evidence linking business creation to increased consumption. Nor is there any strong evidence of credit access leading to income gains. The obvious question is of course, why the impact of microcredit is so limited? We cannot provide an adequate answer to this question at this point, it needs to be further

addressed in future research. But the research have given us some indications. Field et al. (2011) pointed out how the default aversion of microcredit institutions may come at the cost of entrepreneurial activity: Joint liability may induce repayment but clearly works against those who wants to take risks. Nor is it obvious that people applying for loans are fully rational regarding their prospects (Banerjee & Duflo, 2011; p. 169). Even in Norway, the press is full of stories about households stuck in a debt traps because they overused their credit cards (there is even a TV-show in its 12 series about it). Another possibility is that the loan sizes are too small to finance large or even medium-scale businesses. Yet it might just be that credit to start businesses is not essentially what the poor need. The fact that they increased their purchase of durable goods and reduced their expenditures on unnecessary goods suggests that the poor use microcredit as a way to commit themselves to a savings plan. But as Banerjee & Duflo (2010) points out, if microcredit is understood as a form of making a commitment to save, savings in a more direct form would benefit the poor more. Indeed, it involves receiving interest rather than paying it. Moreover, as Collins et al. (2009) show through yearlong interviews with poor households in Bangladesh, India, and South Africa, focusing on their financial behavior; financial services are most fundamentally used to cope with low, irregular and unpredictable incomes. To get food on the table every day, to repair the family home, to pay school and doctor's fees, to buy a fan for the hot season or a new set of clothes for a wedding. These financial needs are not different from the needs of richer households, nor are they necessarily tied to running small businesses. After all, poverty is a complex and multidimensional phenomenon made up of several factors that constitute poor households' experience of deprivation – for example poor health, lack of education, weak labor markets, and discrimination. All of these factors represents challenges that could undermine the effect of microcredit on raising incomes. Microcredit may not be the miracle cure it was considered to be, but Yunus showed us, once and for all, that the poor are indeed bankable. It was just a matter of finding the right lending mechanism.

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