

Empowerment and Poverty Alleviation: Effects on Targeting Women in Developing Countries

by

Anders Sunnås Gundersen

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Abstract

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Supervisor: S. Quamrul Ahsan

In this thesis I assess the problems and solutions microfinance institutions face when entering a rural credit market characterized by information asymmetry and low degree of enforcement possibilities. Bangladesh and the Grameen type of microcredit are used as examples when describing how solutions have been applied.

Standard theoretical models on adverse selection and moral hazard are assessed in order to give an understanding on how microfinance institutions have been addressing the various challenges when designing credit contracts in developing countries.

A problem that has not yet been properly assessed in available literature is how households make the decision to obtain credit. I show that under certain assumptions the applied *separate spheres bargaining model* explains why women may be kept out of the credit market by their husband. This has policy implications that challenge the contract design used by the Grameen Bank and many other microfinance institutions. Discussions on microfinance outreach have to consider intra household decision making in order to reach their dual goal of alleviating poverty and empowering women. The applied model shows that an inflexible approach towards targeting women may lead to a situation where women are kept out of the market for microcredit.

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Chapter 1

Introduction

In 2006, Dr. Mohammed Yunus and Grameen Bank were awarded the Nobel Peace Prize “for their effort in creating economic and social development from below” (Norwegian Nobel Committee, 2006). Thus, all eyes were pointed towards *microfinance* and access to microcredit as a way to break out of poverty. Subsequently, microcredit has also been named as a tool to empower women in developing countries (e.g. Hashemi, et al., 1996 and Pitt, et al., 2006). Targeting women has evolved as a result of continuously changing strategies, and the share of female participants in microfinance NGO’s has increased steadily since modern microcredit was introduced (i.e. Goetz and Sen Gupta, 1996).

The motivation for this thesis comes from the growing acknowledgment of the success the microcredit institutions have had in targeting women over the last 25 years. Microlender pioneers, such as the Grameen Bank in Bangladesh, discovered through experience that female clients were more reliable customers, most notably because they had better repayment records compared to male borrowers. Further, research has shown that female borrowers make higher contributions to their own family’s increased welfare than male borrowers (Khandker, 2003). Other explanations to why women make the preferred clients may be that they have restricted access to market labour; they are more likely not to have access to other sources of credit and that the microloan can empower women in their own household (Pitt, et al., 2006). In sum this story intuitively sounds good; by targeting women not only does the lender receive a higher repayment ratio, it also produces better welfare outcomes.

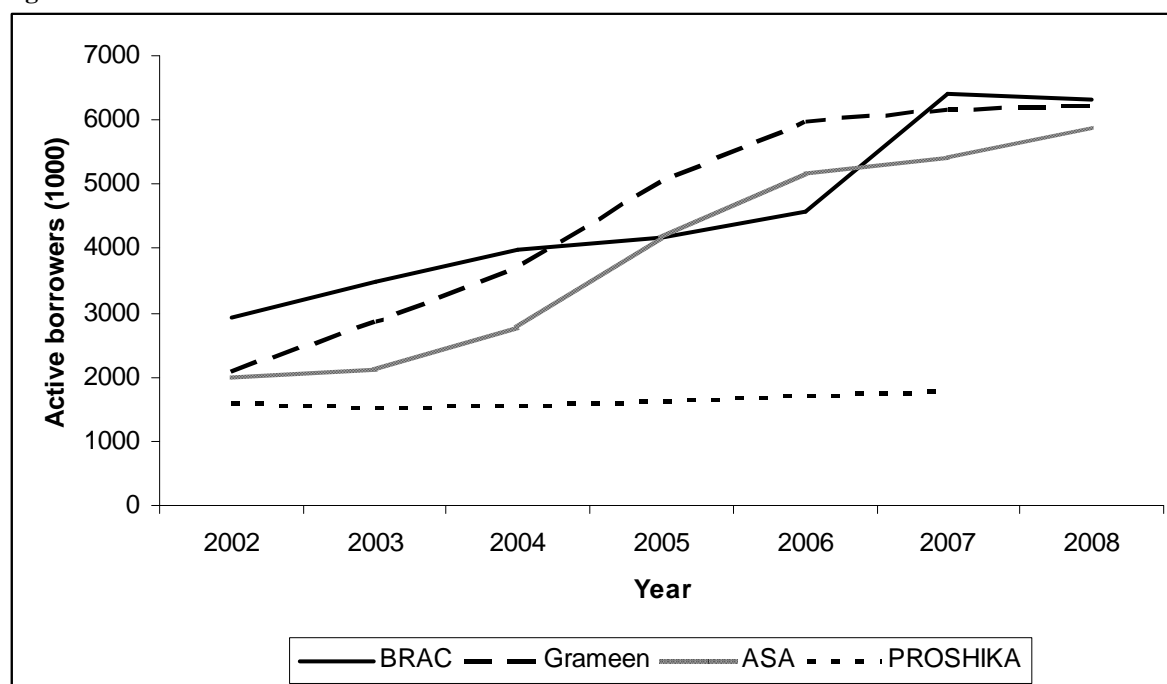
In Bangladesh, 40 percent of the population lives beneath the national poverty line. Breaking the numbers further down, we find that 50 percent live for under \$ 1.25 a day, and a total of 81 percent under \$ 2 a day (UNDP, 2009)¹. With a population of 157.8 million, at least 63 million people live beneath the national poverty line, and a large share of the population lives just above. Still, Bangladesh has managed to reduce poverty significantly over the last years, with a drop from 49 percent in 2000 to 40 percent in 2005 (The World Bank, 2008). Measuring gender related poverty is difficult, but there are research that suggest the around 70 % of the world’s poor are women (UNDP, 1996).

¹ The data from the UNDP Human Development Report 2009 refers to the most recent year available in the period 2000 to 2006 for the national poverty line, and for the period 2000 to 2007 for the \$1.25 and \$2 data.

The market penetration – to be understood here as the share of clients served to potential clients – of microfinance varies between countries, and Bangladesh is by far best in class. A market penetration of 35 percent² (MIX and Intellectap, 2009) still reveals the huge potential for growth, and the vast majority of potential clients are not served by a microfinance institution (abbreviated MFI). There is a need to evaluate why the market penetration is not higher, and my take on this is to evaluate if targeting women may be one explanation on why the Bangladeshi market for microfinance shows signs of saturation.

Figure 1 shows the development in active borrowers within the four largest MFIs in Bangladesh from 2002 to 2008. Together, these four institutions account for over 87 percent of the active borrowers within a microfinance program in 2008³.

Figure 1 – Active borrowers 2002-2008⁴



The expert opinion on how microcredit can bring about *poverty reduction* as well as *social development* (e.g., empowering women) is that the two objectives are indeed interconnected. Alleviating poverty is the goal, and empowering women may be seen as a means to achieve this goal. In this thesis, I provide a review of the literature – both theoretical and empirical –

² Share of active borrowers to poor (potential borrowers) in Bangladesh, data from 2007 published in Asia Microfinance Analysis and Benchmarking Report 2008.

³ Estimated using data from Mix Market (2009).

⁴ Data from 2008 for PROSHIKA were not available at the time the thesis was written.

on the various challenges or obstacles that the microcredit institutions face, and the possible solutions that have been employed to overcome these obstacles. Without mechanisms designed to work around lack of collateral, adverse selection and moral hazard there would be no market for microcredit. When the dysfunctional market starts functioning as a normal market for credit, the next step is to assess how achieve the best outcome when distributing credit. There are evidence that targeting women increases economic growth, but targeting in itself may conflict with the desire to help as many as possible on their way out of poverty. I show with the applied model that the result of targeting women may conflict with the desire to empower women, and that in the husband experience a loss in utility as a direct result from the wife's increased bargaining power. This loss in utility gives the husband incentives to veto the loan if he is able to do that. In the analysis in chapter 4, I assume a patriarchal society where the husband is able to deny his wife access to credit.

With a narrow targeting rule, one effectively eliminates a large share of potential customers, namely men. Even though there are weighty arguments in favour of targeting women, both the distributional effect and the consideration for economic effectiveness need to be addressed before one decides on the design of the targeting rule. A non-profit microfinance institution's goal should intuitively be to reach as many clients with worthy projects as possible, in other words they should be client maximizing⁵.

In Bangladesh, the home of modern microfinance, we find a strongly patriarchal society (Alam, et al., 2000). I find that within traditional families it may not always be in the husband's best interest to allow his wife to have access to microcredit programs. My results suggest that the very goal of targeting women with microcredit stands in violation of the established cultural norms of patriarchal societies. The result could be that potential female borrowers are kept out of the credit market, even though these women have projects worth financing. If so, the contract design in many microfinance institutions should be rethought.

My findings are not uncontroversial. The fact remains that targeting women has proven to be a success compared to other strategies (e.g. Kevane and Wydick, 2001)⁶, and is now the most prevailing strategy for microfinance institutions. To the best of my knowledge, there is

⁵ There are of course constraints tied to funding, personnel, etc.

⁶ At an early stage, the Grameen Bank tried gender separated groups, but no gender bias in targeting clients. Female groups showed better repayment rates, and thus women became the preferred client. Kevane and Wydick (2001) find that women outperform men in a MFI in Guatemala.

virtually no analytical literature on the issue of why there are poor women who are eligible but do not participate in microcredit while other women in a similar situation do. This thesis attempts to provide an analytical framework to address this issue. The results from the model developed in Section 4.2 crucially rely on which social and cultural context one assumes, and the model is more applicable to strongly patriarchal societies.

Outline

In chapter 2 I will start with a brief overview and explain some of the special features of microcredit. In section 2.1 I offer updated data on microfinance outreach, and I find a substantial growth in active borrowers in the developing world over the last 25 years. In section 2.2 there is a short review of the Grameen Bank and the Grameen type microcredit. In chapter 3 I will address the various challenges MFIs face when entering the rural credit market in developing countries, and which solutions the Grameen Bank and others have applied to overcome these challenges. Basic models on adverse selection and moral hazard will be reviewed in sections 3.1.1 and 3.1.2 respectively, and in section 3.1.3 the rather special effects of competition in the market for microcredit will be discussed.

In chapter 4 the Grameen Bank's and other MFI's decision to target women will be addressed. A *separate spheres bargaining model* is presented in section 4.2 to explain under which circumstances a husband will have incentives to deny his wife access to microfinance, even though the project financed by the loan will raise the total household income. I find that microfinanced projects require returns over a certain level to ensure that the husband will have a utility gain by letting her wife have access to microcredit programs. The model also explains why the husband will have incentives to deny his wife access to microcredit due to the husband's utility loss when the expected return on the project is low. The calculations behind figure 4 are performed in MS Excel with input functions from equations (18), (20) and (22).

Chapter 5 summarizes the findings in this thesis.

Chapter 2

2.0 Microcredit

Neoclassical growth theory predicts that capital will flow to where it receives the highest return. Given a production function with diminishing marginal returns to capital, basic economic theory tells us that there should be no need for microcredit because it will flow to where it receives the highest marginal utility. However, we do not need to go into deep economic analysis to see that this is not the case in reality.

Investors are not willing to offer capital to the developing world due to – among other arguments – risk affiliated with shifting political environment; unclear property rights; lack of collateral and lack of local knowledge. In other words, capital markets are imperfect.

Lucas (1990) provides a very describing example on how the capital markets would behave according to neoclassical models of growth and trade. Using the Cobb-Douglas constant returns technology, he motivates the reader by showing that the marginal product of capital in India must be 58 times the marginal product of capital in the United States⁷. If credit markets were free, all investment would happen in India or other countries with lower production per capita. His example proves the shortcomings of neoclassical growth theories, and the Lucas' critique has been very important for the development of new theories towards economic growth and development.

In this chapter I will address the basic features of microcredit, and I will concentrate on Bangladesh and the Grameen Bank. Bangladesh is considered to be the cradle of modern microcredit, and the Grameen Bank has had a substantial influence on literature and other microfinance institutions the last 25 years. This does not mean that other institutions and policy makers have not been influential in understanding that banking for the poor might improve welfare.

⁷ Corrected for differences in human capital, the marginal product of capital is five times higher in India compared to the U.S.

Microcredit is a widely used term, but the word itself was invented in the 1970's (Yunus, 2008). There exist various kinds of microcredit programs, though they all share the commitment to serve clients that are excluded from the formal banking sector (Morduch, 1999). Microcredit is small loans that generally are given to finance self-employment activities, and the goal of these loans is to help the poor out of poverty.

Even though it started with small loans, more MFIs now offer savings and insurance as part of the package. Some banks even demand savings in periods of relative abundance⁸. Access to financial services is believed to increase the possibility to smooth and hopefully increase income. In this thesis I will focus on microcredit, more specifically the Grameen type microcredit. I will return to the special features of this kind of credit in section 2.2.1.

2.1 Outreach

Since Dr. Yunus first steps towards what we now know as the Grameen Bank in 1976, the growth in MFIs and their clients have been substantial. Table 1 shows microfinance coverage as reported to the Microfinance Summit Campaign 1997-2007 (Daley-Harris, 2009).

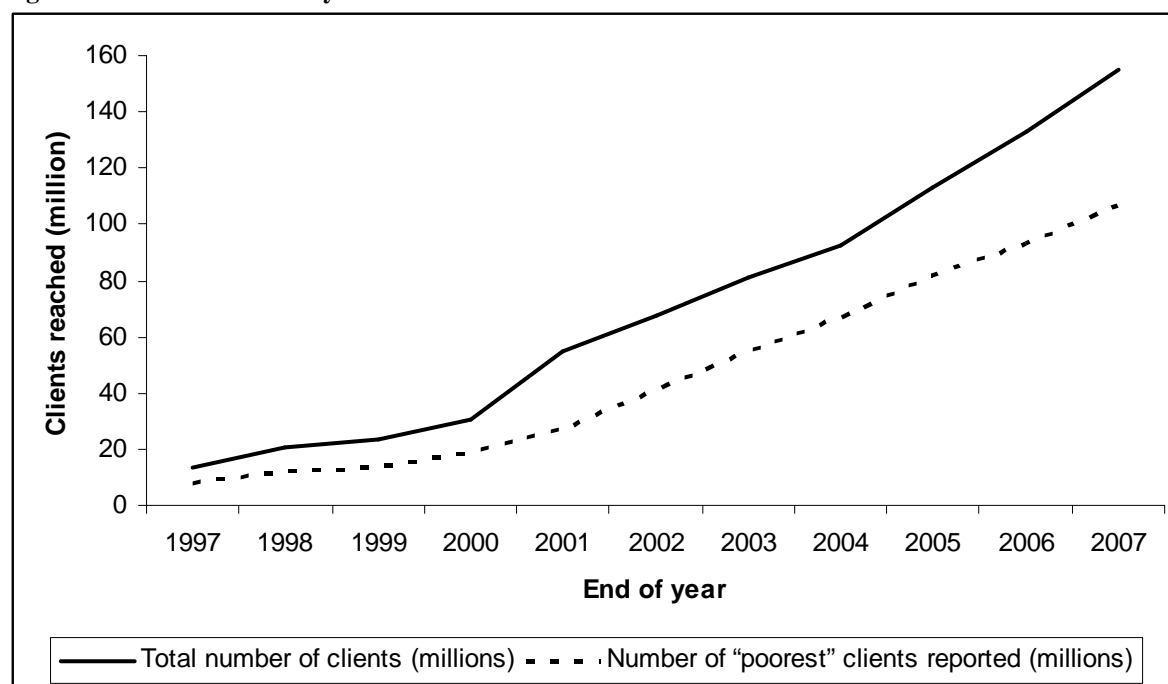
Table 1 – Microfinance Outreach 1997-2007

End of year	Total number of Institutions	Total number of clients reached (millions)	Number of “poorest” clients reported (millions)	Percentage of “poorest” clients reported
1997	618	13.5	7.6	56.3
1998	925	20.9	12.2	58.4
1999	1,065	23.6	13.8	58.5
2000	1,567	30.7	19.3	62.9
2001	2,186	54.9	26.8	48.8
2002	2,572	67.6	41.6	61.5
2003	2,931	80.9	54.8	67.7
2004	3,164	92.3	66.6	72.2
2005	3,133	113.3	81.9	72.3
2006	3,316	133	92.9	70
2007	3,552	154.8	106.6	68.9

⁸ The Grameen Bank's total deposits amount to 145 percent of the gross loan portfolio (Mix Market, 2008).

Of the 154.8 million reported clients, 68.9 percent were of the “poorest” clients, defined as “(...) the bottom half of those living under their nation’s poverty line” (Microcredit Summit 2003). Figure 2 shows the development in the share of poorest clients reached from 1997 to 2007.

Figure 2 – Clients reached by microfinance 1997-2007



The developing world is by far where microfinance has its stronghold. This is no wonder, as most individuals in more developed countries have access to income smoothing financial services from birth. Still, there are microfinance institutions targeting small entrepreneurs in what we consider to be rich and highly developed countries, such as the United States (Schreiner and Morduch, 2001). There is a distinct difference between microenterprises in the developed and the developing world. In the United States it is more common with microenterprises that produce non-traded services; in the developing world both services and market goods are produced (Schreiner and Woller, 2003). Asia and the Pacific is the region where one finds most microfinance providers and clients (Daley-Harris, 2009), followed by Latin America.

Table 2 – Geographical Distribution of microfinance institutions and clients

Region	Number of programs reporting	Number of total clients in 2007 (millions)	Number of poorest clients in 2007 (millions)
Asia and the Pacific	1,727	112,7	96,5

Developing World Totals	3360	149,7	106,2
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Bangladesh has roughly 23.1 million active clients as of 2008. Bangladesh is also home to some of the largest microfinance institutions in the world, most notably the Grameen Bank, the Bangladesh Rural Advancement Committee (BRAC) and the Association for Social Advancement (ASA). Together these three institutions serve nearly 18 million clients (Mix Market, 2009).

2.2 The Grameen Bank

The Grameen Bank of Bangladesh is mentioned as an excellent illustration of how credit can be provided to the poor while minimizing the risk that resources will be wasted (Todaro and Smith, 2006). It has also been awarded much attention internationally, most notably with the Nobel Peace Prize in 2006. Lessons learned from the Grameen Bank have spurred other microfinance institutions with either the same or an adapted methodology both in Bangladesh and the rest of the developing world. In 2008, the Grameen Bank served over 6.2 million active borrowers, and the gross loan portfolio amounted to approximately 642 million \$.

The expansion of microfinance institutions has been substantial throughout the developing world since the 1980s, and the Grameen Bank has been one of the flagships in this development. Formally chartered in 1983, Professor Mohammed Yunus' brainchild from 1976 had become a reality which was to set the standard for microfinance programs during the following decades. Yunus became convinced that the lack of access to credit was one of the most important constraints on economic progress, and wanted to demonstrate that it was possible to lend to poor without physical collateral. The first loans were guaranteed by Yunus personally, and after a series of expansions the Bangladeshi government were convinced of Grameen's value, thus the Grameen bank became a formal financial institution.

2.2.1 Grameen type microcredit

The most notable feature of the Grameen type microcredit is that it is given only to groups of borrowers, specifically to groups of female borrowers⁹. In fact, some claim that this is the reason for its success (e.g. Stiglitz 1990). As we will see in chapter 3, the group-lending model mitigates much of the information asymmetry that comes with banking in an unregulated area. The mission of Grameencredit is to help the very poor to help themselves out of poverty through self employment income generating activities. In addition, the Grameen Bank offers credit to help the very poor build houses that raise their living standard.

Loans are relatively small¹⁰, and instalments are to be paid weekly or bi-weekly. The loan officers from the Grameen Bank are to meet borrowers where the borrowers are, that is, they meet in centres in or near the villages where the clients live.

The Grameen Bank has a strong focus on social development, and has a set of rules that the clients must adhere to. These rules comprise of housing quality and living conditions; growing crop; family planning; education; in short 16 decisions that are meant to help the clients out of poverty. The group members are all trained by the bank. The training consists of learning about bank procedures, information on the group savings program, the role of the centre chief and the chairperson of the group, bookkeeping, and if required, how to write their signature.

The group-lending model invented by Grameen was based on experimentation (Todaro and Smith, 2006). Initially, loans were given to individuals, but this proved to require too large resources when it came to monitoring use and repayments. Larger groups of ten persons were tried, and proved to be too large for intimate and informal peer-to-peer monitoring to be effective. The group lending model of five persons proved to be the most efficient in practice.

The Grameen Bank is as of November 2009 organized into 2,560 branches that in turn serve 84,787 villages and 7.9 million clients¹¹, 97 % of which are women. The branches are set up

⁹ There are exceptions to the rule. In November 2009, male clients make up 3 percent of total clients.

¹⁰ In 2008 the average loan balance per borrower in the Grameen Bank was \$ 103. By comparison, ASA's and BRAC's borrowers had a balance of respectively \$ 79 and \$ 102.

with a branch manager and a number of centre managers, and the branch covers an area of about 15 to 22 villages (Grameen Bank, 2009). It is mandatory that the staff and the managers visit villages to familiarize themselves with the environment they are going to serve, and carry out the important role of informing prospective clients of their purpose and functions. Groups of five clients are self-formed, and two of the group's members receive the *initial* (individual) loans. Only if the two persons comply with and act according to the rules set by the bank, will the other members of the group be eligible for loans – thus the peer-pressure is established as the sole collateral for the bank. I will return to a more formal discussion around group formation in chapter 3. Financial incentives to repay the loans are ensured by increased access to loans when the current loan is repaid, and the group can also earn a 5 % increment in loan size by attending all activities and all group members repay their loans. An additional increment can also be earned when all borrowing groups in a centre manages to keep perfect records.

The Grameen Bank claims to target the poorest of the poor, and the participants must undergo a two-week training session before any loans are issued. The sessions are followed by weekly group meetings with a bank officer. The bank reports a 96.8 percent repayment rate on their November 2009 report (Grameen Bank, 2009), a rate that is subject to some controversy due to for instance the flexibility of the bank when it comes to refinancing the loans when lenders meet financial difficulties – but in any case, the rate is far higher than the national average for bank loans to much wealthier borrowers (Todaro and Smith, 2006). The Grameen Bank also promotes saving as a mean to reduce the risk of income fluctuations. Often the loans are tied to saving requirements or incentives.

¹¹ Not all clients are active borrowers; some clients may have only savings and/or insurance. In fact, end of year 2008 the Grameen Bank reported 7.67 million clients, all with deposit accounts. The average deposit was \$ 122, surpassing the average loan balance with over 18 percent.

Chapter 3

In this chapter I will start with addressing the difficulties MFIs face when entering rural credit markets. I will review the models found in microfinance literature that treats the problems and the solutions the Grameen Bank has applied, and further discuss the proposed solutions. The motivation behind this is to provide a backdrop on how MFIs have managed to work their way around obstacles up until now, and to show that MFIs through their innovativeness and ability to adjust along the road have managed to reach a substantial amount of borrowers who before was deemed to be unwanted clients by the formal banking sector. This ability proves well for the future. Continuously redesigning contracts to solve new challenges may prove to be important to improve microfinance outreach, as we will see in the next chapter.

The idea behind intervening in credit markets is the belief that one can improve both efficiency and aggregated welfare in doing so. Behind this belief is an assumption that credit markets are not functioning as they should. The argument behind improving efficiency is that there are potentially productive borrowers on one side and financial institutions with abundant funds on the other side. In short: The market for allocation of capital does not function, and this market failure may have several explanations. In the following I will address these explanations, and describe how MFIs have design mechanisms to work around them.

3.1 The Challenges

An MFI faces some significant difficulties when opening business in an unknown territory. These problems are based on the lack of collateral the borrower can put up; high transaction costs; information asymmetries between the principal (the MFI) and the agent (the borrower); and formal and moral difficulties when it comes to enforcing contracts.

Accepting that there is a credit market failure in rural areas of developing countries, decisions on if and how to intervene must be addressed. The rural credit market in developing countries is often characterized by local moneylenders operating under a limited access to funds. Thus, introducing financial institutions with better access to funds might improve outreach by allocating credit to a larger group of people. Stiglitz (1990) and others point out that even though local moneylenders sometimes are seen as exploitative due to high interest rates, these

“exploitative” rates might be a result of high default rates, correlation between defaults as the borrowers often are subject to symmetric shocks, and the high costs related to screening of borrowers and follow up on loans. As mentioned above, an “outsider” MFI faces these challenges when entering this market, in addition to the moral and ethical challenge: What actions can a poverty alleviation focused MFI undertake to minimize default on loans that does not conflict with its goals?

To secure the loans given to individuals, traditional banks require collateral. In developing countries, available collateral may be non-existent, or the offered collateral is of no value to the MFI. For an MFI whose goal is poverty alleviation, seizing property or assets from the poor when defaulting on their loans has other implications that often directly conflicts with the MFIs very reason for existing. Leaning on these arguments, it is safe to say that borrowers have limited liability, and that they cannot follow a repayment scheme that exceeds their current income (Armendariz de Aghion and Morduch, 2005).

3.1.1 Adverse Selection

The lack of local information may lead to the problem with adverse selection. A bank or an MFI without local information is not able to select the right risk profile in their portfolios. This often contrasts with the information local moneylenders have, who can separate borrowers according to riskiness, and charge interest rates according to the borrower’s risk profile (Stiglitz, 1990). Because of the information asymmetries, an MFI could be put in a position where it has to charge exceedingly high interest rates and by this drive the “good” borrowers out of the market (Armendariz de Aghion and Morduch 2005). A numerical example that shows this mechanism is presented in table 3.

A simplified model¹² of adverse selection analyzes the agency problem. The MFI has no way to decide which borrower is safe and which is risky. Riskiness is inherent, and the individual has no incentives to tell the MFI if she is risky since the MFI then would “reward” her with a higher interest rate.

¹² The framework used in the review is from Armendariz de Aghion and Morduch (2005).

In the model we have two individuals; one risky and one safe. Each individual can invest L ($L = 1$ for simplicity) amount of borrowed money in a project. The safe borrower will receive revenue of y_S with probability $p = 1$. The risky borrower receives revenue y_R with probability p , where $0 < p < 1$. If the risky individual should succeed, she will receive a higher return on the project than the safe individual. If the project fails, there will be no possibility to repay the loan because of no seizable collateral, and the loss has to be absorbed by the MFI. The expected return on either project is assumed to be equal, and by that it is easy to see that the risky individual's project has to yield a higher return when successful ($py_R = y_S \Rightarrow y_R > y_S$).

The MFI is assumed to aim for zero profit in a competitive market¹³. The bank is then committed to cover its gross cost of capital, k . The gross cost is assumed to be higher than L because of costs of funding, administration etc. We further assume that both clients have a project worth funding; that is that both the risky and the safe yield expected revenue of $y_S = py_R > k$.

The presence of the risky individual in the economy means that the MFI has to charge a higher interest rate than k to break even. The MFI knows that in the population ($n = 2$ in the model), 50 percent is of the risky type. But they have no possibility to tell which one, and this means that the required gross interest rate has to be raised for both individuals from k to R where $R > k$. If q is the share of safe individuals, then $1 - q$ must be the share of risky individuals. The required gross interest rate has to be set so that the expected returns from both individuals cover the gross cost of capital: $k = [q + (1 - q)p]R$. Solving for R gives us the required gross interest rate:

$$R = \frac{k}{[q + (1 - q)p]} \quad (1)$$

This is the gross interest rate (loan plus interest) required to ensure that the MFI breaks even. Adverse selection appears when the gross interest is set at such a high level that the safe borrowers do not find it worthwhile borrowing any longer and withdraw from the market. The

¹³ This is to simplify the analysis, and in many areas it is also closer to reality (see for instance McIntosh and Wydick, 2002).

numerical example in table 3 illustrates the principles of “Market for “Lemons”” (Akerlof, 1970).

In the example this applies for all scenarios: Loan size is $L = \$100$; the expected gross revenue of the borrower’s project is \$200; the opportunity cost (the value of ordinary labour) in the same period is \$44, and the cost of capital k for the MFI is \$40. The fraction of safe to risky borrowers in the population is $\frac{1}{2}$. Loan size is set at \$100 for illustration use, but this is also close to the average loan size in both the Grameen Bank and in BRAC. The cost of capital is set high because of the considerably higher cost it is to provide small and many loans than comparatively larger and fewer.

Table 3 – Numerical example adverse selection

	Gross revenue if successful	Probability of success, p	Required interest rate, r	Expected net revenue	Aggregated social surplus ¹⁴
Safe 1	200	1	43.6	12.4	32
Risky 1	210	0.95		19.1	
Safe 2	200	1	51.4	4.6	32
Risky 2	235	0.85		27.1	
Safe 3	200	1	86.7	0	16
Risky 3	267	0.75		16,3	

From the hypothetical data in table 3 we can extract some interesting results to illustrate mechanism that may lead to adverse selection. As a starting point, we assume that both the safe and the risky type have projects worth financing. The safe project yields the same revenue in each scenario, but we increase the riskiness and thus the required gross revenue of the risky project gradually from the first scenario (Safe 1/Risky 1). In the two first scenarios, both the risky and the safe project yield positive expected net revenue, and aggregated social surplus are equal to 32 in both scenarios. Thus we cannot observe any market inefficiency at this stage. We see from equation (1) in calculating the required interest rate, that the individuals undertaking the safe project subsidize those undertaking the risky project, but there is no efficiency loss because of the MFIs inability to differentiate between the two types. The required interest rate increases from 43.6 percent to 51.4 percent in the second scenario, but both individuals still receive positive revenue from the project.

¹⁴ Approximate values for illustration use only. Real values are +/- 0.5. The example is adapted from a similar model in Armendariz de Aghion and Morduch (2005).

Increasing the riskiness of the risky fraction even further in the third scenario, we have some interesting results. The expected net revenue for the safe project (Safe 3) is negative due to an even higher required interest rate to break even, and the rational choice for the safe individuals is therefore not to undertake the project but rather stick to ordinary labour (the actual point of safe borrowers leaving the market in this example is when the required interest rate $r \approx 56\%$). This solution is inefficient, as we said earlier that both types have projects worth funding. When safe borrowers no longer want to borrow, they leave the market. The MFI observes that half of their clients are no longer interested in loans at the offered interest rate. When no cross-subsidizing takes place, the risky fraction has to bear all the risk. The interest rate increases further from 51.4 to 86.7 percent in the last scenario. The risky individuals still invest in their projects, as expected net revenue is still positive, but they are worse off than when the safe borrowers still were in the market. We also see that the aggregated social surplus – calculated as the sum of the expected net revenue for the safe and risky borrower – is reduced by 50 % when the safe fraction leaves. Working around adverse selection by designing mechanisms to utilize available local information has been named as one of the success criteria of the Grameen Bank, and we will continue to address this in the model in section 3.2.1 after further addressing the challenges the MFI encounters in their work.

3.1.2 Moral Hazard

The moral hazard problem arises because the borrower can choose to withhold information or default on his repayments. The MFI has little or no information on the “quality” of the borrower, and in developing countries the typical borrower cannot put up collateral to compensate for this, either because of lack of land or due to social and legal reasons (Armendariz de Aghion and Morduch, 2005). The MFIs have little or no possibility to observe actions carried out by lenders, so after the credit has been paid out, the lender has “lost control”.

Opportunistic actions performed by the borrower after the credit is received, but before the project returns are realized, are called *ex ante* moral hazard. These actions can have a direct effect on the outcome of the project, and in combination with no collateral this can lead to

inefficiency. A basic model may be outlined as followed (Armendariz de Aghion and Morduch, 2005):

An individual with no initial wealth and no other collateral can invest a borrowed sum of money, L ($L=1$ for simplicity). In the model we have only one period, which limits the lender's opportunity to utilize mechanisms that will be addressed at a later stage. The borrower is faced by the following possible scenarios: expend effort at cost c to obtain positive profits y_i with probability $p = 1$, or expend no effort and no cost to obtain profits y_i with probability $p < 1$.

The lender's cost of capital is k , and the required gross interest rate (principal plus interest) is R , and $R > k$. The borrower will have no opportunity to fulfil the repayment obligations if the project is unsuccessful. The borrower will only spend effort at cost c if:

$$y - R - c > p(y - R)$$

Solving for R we have:

$$R < y - \frac{c}{1-p} \quad (2)$$

The gross interest rate R has to stay lower than $y - \frac{c}{1-p}$ to ensure that the borrower will use any effort. If the interest rate is raised beyond this, the borrower will have no incentives to use effort at cost c , and the lender will lose L plus the cost of obtaining capital if the borrower is unsuccessful.

To further evaluate why ex ante moral hazard will lead to an inefficient allocation of funds, we will consider a situation where we have an ex ante efficiency. The lender's cost of capital, is less then the certain outcome $y - c$ (keeping in mind that the probability is equal to 1) when the borrower expends effort. In this situation where $k < y - c$ the borrower should be given a loan, but the lender still has no way to ensure that the borrower will spend any effort. If the lender then has to consider the probability of loss – thus making the cost of capital higher –

the interest rate may be set at a level where the borrower has no incentives to fulfil the repayment obligations. The inefficient outcome due to ex ante moral hazard will be that the borrower could get the loan if a credible commitment to spending effort to ensure outcome $y - c > k$ could be made.

The borrower has the choice not to return the capital received for the project. Ex post moral hazard arises as a result of either an information asymmetry between the lender and the borrower or because of weak enforcement possibilities, or a combination of the two. To model this problem, I will again use the basic framework from Armendariz de Aghion and Morduch (2005).

The loan L ($L = 1$ for simplicity) is invested in a project with a probability of success p equal to 1. We assume that the borrower in this case has seizable private wealth w . The lender breaks even with a fixed required gross interest rate R . Default on the contract is verified and enforced with probability s . The lender is faced by the problem of when the borrower will choose to own up to the obligations of the contract. The borrower will choose to fulfil the obligations if the incentive constraint below is satisfied:

$$y + w - R > (1 - s)(y + w) + sy$$

Solving for R

$$R < sw \tag{3}$$

The MFI's break-even gross interest rate has to stay lower than the size of the seizable collateral and the probability to seize it. If there is no collateral to be seized, no loan will be given.

3.1.3 Competition

A more curious challenge the MFIs are facing, is increasing competition in the market for offering microcredit. New market entrants, either NGOs or commercial banks, may undermine the work started by the incumbent MFI. History has taught the MFIs and

economists that competition is not necessarily good when one aims towards creating the right incentives in the market for microcredit. There are reports on how increased competition has led to lower repayment rates in several development countries, and Bangladesh is no exception. The Bangladesh Rural Advancement Committee (BRAC)¹⁵ researchers Chaudhury and Matin (2002) show a clear declining trend in loan repayment regularity with an increasing number of memberships in different MFIs, a relationship that could undermine most if not all incentives designed in the Grameen type credit contract. If lenders become competitors or exist in the same rural areas without any regulatory supervision, the threat of being excluded from further credit is less credible. Borrowers may exploit this to gain more credit and the risk of default also increases (e.g. Chaudhury and Matin, 2002).

McIntosh and Wydick (2005) consider a situation where new MFIs enter the market for microcredit, and their findings are not positive when one looks at how the poorest of the poor are affected by an increase in competition. Leaning on the argument that competition will be concentrated around the profitable borrowers, McIntosh and Wydick find that competition may lead to social development orientated MFI having to discontinue credit aimed at the poorest of the poor. The argument is that they will lose the possibility to make the comparatively wealthier borrowers cross-subsidize the required interest rate.

In rural Bangladesh, and in many other developing countries, there is no easy way to monitor borrowers. Absence of centralized, personal information such as credit scores and national identification numbers make it difficult to collect needed information. MFIs such as the Grameen Bank have been able to collect and control local information through loan officers and contract design, but still McIntosh and Wydick show – in a more analytical way than Chaudhury and Matin (2002) – that an absence of regulatory supervision (or more correctly increased information asymmetry) may lead to the same discontinuation of loans to the very poor.

¹⁵ BRAC is as of 2008 the largest microfinance institution in Bangladesh, both in terms of active borrowers and gross loan portfolio, serving 6,237,250 clients with a gross loan portfolio of \$ 647,938,718.

3.2 The Solutions

Several explanations of why the Grameen model has become the most famous and acclaimed model has been discussed in many notable articles. Stiglitz (1990) and Ghatak (1999) provides a framework to understand the mechanisms the Grameen Bank uses or has used in the past. The Grameen Bank had to work around problems such as limited liability; lack of collateral; high transaction and monitoring costs; low repayment rates and information asymmetries (adverse selection and moral hazard). By experimentation and a continuous redesign of the Grameen Bank's role as a microfinance institution in the rural Bangladesh, this MFI boast of high repayment rates and near sustainable banking (Grameen Bank, 2009 and Mix Market, 2009).

In this section I will review how the Grameen Bank has overcome the various challenges faced by institutions seeking to offer banking opportunities for the poor.

3.2.1 Peer Selection and Adverse Selection

In analyzing how the MFI may utilize local information to mitigate adverse selection, Maitreesh Ghatak's article *Group lending, local information and peer selection* (1999) provides a very good framework to understand the mechanisms used by the Grameen Bank and other MFIs that follow the "Grameen way". In the following I will provide a short and simplified version of his findings, together with a numerical example that may be seen in context with table 3 earlier in this chapter.

We still have information asymmetries between the lender and the borrower. The MFI is behaving as in a competitive market aiming for zero profit, and there are no seizable collateral. All loans will have to be offered to all borrowers at the same nominal interest rate since it is not able to differentiate between the different types of borrowers. The borrowers however, know each others' types; they are again either safe or risky.

The MFI could analyze each individual's risk profile, but this is costly and inefficient. Ghatak shows that even without the MFI knowing the risk profile of the clients, the self-formation of

groups ensures that people with equal risk profile group together. A potential client will use local information to team up with partners that ensure the best outcome. Joint liability makes the safe type the better choice, and they will group together. The risky types have no other alternative, so they will also group together. This segregated formation of groups is known as assortative matching.

Ghatak (1999) analyzes the group formation game with groups consisting of two individuals. He shows that his findings also apply to the “standard” Grameen group of five, in fact to any group of individuals. In the simplified model, each individual lives for one period, and invests \$1 in a project. The fraction of safe borrowers are represented by q , and the fraction of risky borrowers is $(1 - q)$. The safe individuals always receive a gross return y_S with probability $p = 1$, and the risky individuals receive a gross return of $y_R > y_S$ with a probability of $p < 1$ if their project is successful. The risky individual’s project fails with a probability $(1 - p)$ and yields 0 in gross return if so. Expected returns are again equal; $py_R = y_S$. The MFI is committed to the zero profit condition, but the cost of capital is higher than L ($k > 1$) due to transaction costs etc. Further analysis depends on borrowers actually sorting themselves in groups of safe/safe and risky/risky, but for now we will treat that as given.

A short formal analysis on what will happen with the required gross interest rate R with a group lending contract compared with an individual contract is interesting. Let us start with the individual contract:

Knowing that part of the population is of the risky type, the MFI needs to charge a higher interest to make up for the risk. Since the MFI is not able to distinguish between risky and safe borrowers, this extra charge will be distributed amongst both types of borrowers. The required gross interest rate thus increases from k to R . The zero profit aiming MFI will work under the condition from equation (1):

$$R = \left[\frac{k}{[q + (1 - q)p]} \right]$$

R is the equilibrium gross interest rate that the MFI has to set in a market where both risky and safe borrowers participate. The safe individual will have to subsidize the risky individual when the MFI is unable to tell which is which.

In the presence of a group lending contract, where safe and risky individuals sort themselves together in their respective groups, the required gross interest rate will differ from the one calculated for individual contracts. All the same conditions apply, with the exception of the individuals being two and two in groups of safe/safe and risky/risky. We also assume that the risky borrowers always can repay for the other group member if she is successful and the partner is not ($y_R > 2R$), which ensures only two possible outcomes; success or failure.

The probability that both risky borrowers are unlucky is $(1-p)^2$, and the probability that both or just one are successful is $g = 1 - (1-p)^2$. The MFI now expect the following payment from their customers:

$$k = R[q + (1-q)g]$$

Solving for R :

$$R = \left[\frac{k}{[q + (1-q)g]} \right] \quad (4)$$

We see that the denominator under the group lending contract is larger than under the individual contract ($g > p$). This means that the required gross interest rate to ensure zero profit for the MFI is smaller when safe and risky borrowers group together in their respective groups. This proves that the MFI now has the possibility to lower the interest rate from the individual contract, with the result that risky borrowers repay more often and that safe borrowers return to the market.

The sorting game depends on the fact that the borrowers know each others profile. In the example where loan size $L = \$100$; expected gross revenue is \$200 for both safe and risky types; the opportunity cost for the borrower is \$44; and the cost of capital for the MFI is \$40

for all scenarios. The fraction of safe to risky borrowers in the population is $\frac{1}{2}$ and this is known to the MFI. The safe borrowers are always successful, and the risky borrowers default on 25 percent of their projects¹⁶.

Table 4 – Base numbers group formation game

	Gross revenue if successful	Probability of success	Expected gross revenue
Safe type	200	1	200
Risky type	267	0,75	200

The MFI acknowledges the market failure discussed earlier, and introduces a group lending contract to get the safe borrowers back in the market. A gross interest rate is set to \$155; there is no seizable collateral if the project fails and a penalty of \$45 is introduced if the selected partner fails in her project. Dependent on the numbers given above, the group formation game has the following pay-offs:

Table 5 – The Group formation game

Borrower type	Partner type	
	Safe	Risky
Safe	45	34
Risky	84	75

The risky borrower would prefer to change group, but the additional earnings are not enough to compensate the safe partner to change group. The safe borrower needs a compensation of at least \$11 to partner with a risky borrower, but the risky borrower only earns \$9 by changing group. Thus the optimal sorting property (Becker, 1993, cited in Ghatak, 1999 p. 32) is satisfied; “borrowers not in the same group should not be able to form a group without making at least one of them worse off.” (Ghatak, 1999).

Under this contract, the MFI will be willing to offer loans at interest rate set at 55 % in the example. The safe types will always repay \$155; the risky types will repay \$162 in average.

¹⁶ The numbers in the example are from Armendariz de Aghion and Morduch (2005), but they have been slightly altered to ensure that we do not end up in a situation of indifference between borrowing and working.

This ensures that the MFI's zero profit condition is (more than) fulfilled, in fact the required interest rate may be lowered further to entice the safe individuals back into the market.

We saw from the numerical example in table 3 that with enough risky borrowers, the equilibrium interest rate will be pushed high enough to drive safe borrowers out of the market. The joint liability aspect will induce borrowers of the same risk-profile to group together. Then the effective borrowing cost for risky and safe borrowers will differ, and the risky borrowers pay more on average with the same contract. Joint liability schemes (as the group-lending of the Grameen Bank) will in this case serve to make the credit market with initial information asymmetries behave the same way as a market for credit with full information (Ghatak, 1999). The equilibrium interest rate will be reduced, attracting the safer borrowers back into the market. Joint liability is shown to improve aggregate social surplus – thus improving welfare.

3.2.2 Peer Monitoring and Moral Hazard

The Grameen Bank gives loans to groups of approximately five individuals. The groups are self-formed, and each member of the group is mutually responsible (among others Todaro and Smith, 2006) for repaying the loans. By this, the Grameen Bank is able to exploit local knowledge, transferring costly information for the bank over to the local farmers – who in turn acquire this information relatively costless by simply living near each other (Stiglitz, 1990).

Stiglitz points out that peer monitoring is not without its cost, or more precisely that information is free and that peer monitoring costs in terms of increased risk. Members of the borrowing group all bear risks that would be better absorbed by the bank if the monitoring problem did not exist. Stiglitz raises the question of whether the gains from improved monitoring are worth the costs of increased interdependence due to the joint liability scheme.

In our economic environment we now address peer monitoring as a mechanism to mitigate the information asymmetries that may drive the safe borrowers out of the market, thus creating market inefficiency. We are still talking about a lender without local information, and we

have two neighbouring borrowers who have no problem monitoring each other. The lender would like information passed on from the one borrower if the other is deviating from the contract or more precisely if he chooses the risky project.

The lender offers a contract where the total amount will be higher if the neighbour agrees to co-sign – the borrower can obtain lower interest rate and additional funds. The co-signer must pay an amount if the loan goes into default provided that he himself does not go into default. By introducing this contract, the expected utility of the co-signer depends on his neighbour's actions. Given their interdependence and the imposed symmetry, we can assume that they cooperate on the decision on whether to undertake the safe or the risky project, and that if they choose the risky project they will not report it to the lender.

The co-signer now bears a greater risk. The zero profit condition ensures that the interest rate will adjust to leave the expected return to the bank unchanged. The bank must compensate the co-signers additional risk by providing a larger loan. For low levels of cosignatory payment in case of default, the increase in loan size is greater than required to compensate for the imposed additional risk. Thus Stiglitz concludes that peer monitoring under these conditions enhances welfare and will be chosen over the alternative without successful peer monitoring.

This model of peer monitoring summarize some of the main characteristics of the model used by the Grameen Bank. Stiglitz acknowledges the fact that incentives to monitor the actions of the other members of the group are important. Whether these incentives are provided by a cosignatory penalty in case of default or other schemes seem to be of no importance. If we substitute the amount of money to be paid in case of default with any other variable that is perceived as a cost by the borrower, this will not change the results in his article. The Grameen Bank does this by for instance refusing access to new loans, and by providing incentives to act according to the bank's wishes by introducing increased access to funds if the bank's wishes are granted by the borrowers.

To formally evaluate how a group lending contract affects the MFI and its relationship towards ex ante moral hazard, we must assume that the peer has an opportunity to monitor the actions and impose some kind of penalty on their fellow group member if she does not spend

the required effort to ensure the outcome y . We have, from equation (2), the condition that ensures that borrowers do not shirk:

$$R < y - \left[\frac{c}{(1-p)} \right]$$

If the required gross interest rate rose above this level, the ex ante problem would arise and borrowers would not have incentives to put effort into the project.

With a group lending contract, the inequalities take this form:

$$(2y - 2R) - 2c > p^2(2y - 2R)$$

Solving for R :

$$R < y - \left[\frac{c}{(1-p^2)} \right] \quad (5)$$

We then have two possibilities for the MFI. Since $\left[\frac{c}{(1-p^2)} \right] > \left[\frac{c}{(1-p)} \right]$, the MFI can either increase the required gross interest rate R , or make it more attractive for the borrowers to spend effort at cost c on the project. Joint liability makes one borrower responsible for the other, so in this example there will be no surplus in a situation if both shirk or a situation where one succeed with the project and the other defaults.

To evaluate how peer monitoring affects ex post moral hazard, we assume that revenue is secured and the borrower may choose to repay the loan or just keep the revenue. Borrowers may now wrongfully claim that the project failed, and that the invested money is gone. In the absence of collateral, the MFI must absorb the loss. In section 3.1.2 on moral hazard we saw that if the bank expects this from the potential borrowers in a market, no loans will be available.

Peer monitoring may help the MFI, in that the other group member will monitor the actual outcome her peer's project yields. This information, together with threat of social sanctions, may be utilized to force the peer to pay the required gross revenue to the MFI. In a simple

model from Armendariz de Aghion and Morduch (2005), it is easy to evaluate the signification of peer monitoring.

Our starting point is that the borrower will default on her payment if no peer monitoring is exercised. The MFI knows this, and no loans will be offered. With peer monitoring, the peer may monitor the actual revenue at a cost k with the probability $p < 1$. If the other borrower wrongfully tries to claim failure, the peer may impose the social sanction d . The following inequality has to be satisfied to ensure that the borrower will repay her loan:

$$y - R > y - p(d + R)$$

Solving for R :

$$R < \left[\frac{p}{1-p} \right] d \quad (6)$$

The MFI will now offer loans at a gross interest rate less than $\left[\frac{p}{1-p} \right] d$, which is larger than no loans at all. The result depends on that the borrowers cost k has to be smaller than the expected value of not being liable for the peer's repayment. Again, the design of the group lending contract proves to overcome the challenges one would face with individual contracts.

3.2.3 Handling Competition and Other Contractual Features

As discussed in section 3.1.3, competition amongst microlenders may actually make the poor borrowers worse off. Information asymmetries may result in cases where the borrower repays a microloan with another microloan from another lender, and lead the borrower into a spiral of debt. Moral hazard will increase in this situation, and the likely result is that poor borrowers will be excluded from the market. McIntosh and Wydick (2002) shows in their model that competition may lead to an equilibrium contract that makes everybody worse off, and most notably the poorest of the poor..

Solutions that already exist in the developed world may be the answer to this challenge, for instance a national credit authority or bureau. However, this is difficult in less developed countries without certain ways to establish identity.

The Grameen Bank also applies dynamic incentives to further diminish moral hazard. Starting with small loans, the borrower accumulates rights to larger loans if the contract is fulfilled. There are also rules that regulate access to credit from other MFIs, to prevent the borrower from speculating in default. As discussed in section 3.2.2, this may be seen as a penalty that is designed to reduce moral hazard.

I will not model these dynamic incentives here, since they are more or less intuitively easy to understand. The Grameen Bank has applied a progressive loan scheme that imposes a cost on strategic default by the borrower. This cost has to be taken into account even if social sanctions are out of the equation, and will create an incentive to repay one's loans to increase the loan size in the next stage. By utilizing this technique, the Grameen Bank builds up a credit history, and they will at an earlier stage be able to clear their portfolio of bad clients. The argument is valid in the same way as with the cost of social sanctions.

This chapter summarizes the well analyzed problems that microfinance institutions have used contractual design to work around. The ingenuity of the adopted solutions, such as peer monitoring and peer selection, shows that what was once deemed a dysfunctional credit market now behaves more or less like a well functioning credit market. There are still signs that the market for microcredit still has to evolve; one very interesting challenge is the emergence of competition over the profitable clients and its implications for the poorest in the MFIs's target group of potential clients.

There is still need to keep in mind that very few MFIs are financially self-sustainable, and the majority of microlenders depend on continuous funding (Morduch, 1999). If such funding should come to an end before MFIs are self-sustainable, this will increase the chance of ex post moral hazard.

The next chapter addresses the possible consequences of the contractual feature to effectively target the wanted group of clients, namely women. This contractual feature has been evaluated in an empowerment view in several qualitative and econometrical studies (i.e. Goetz and Sen Gupta, 1996; Schuler, et al., 1998 and Pitt, et al., 2006), but analytical approaches are more scarce. The model presented in section 4.2 seeks to describe the intra household decision making, and also model the microloan's effect on female empowerment.

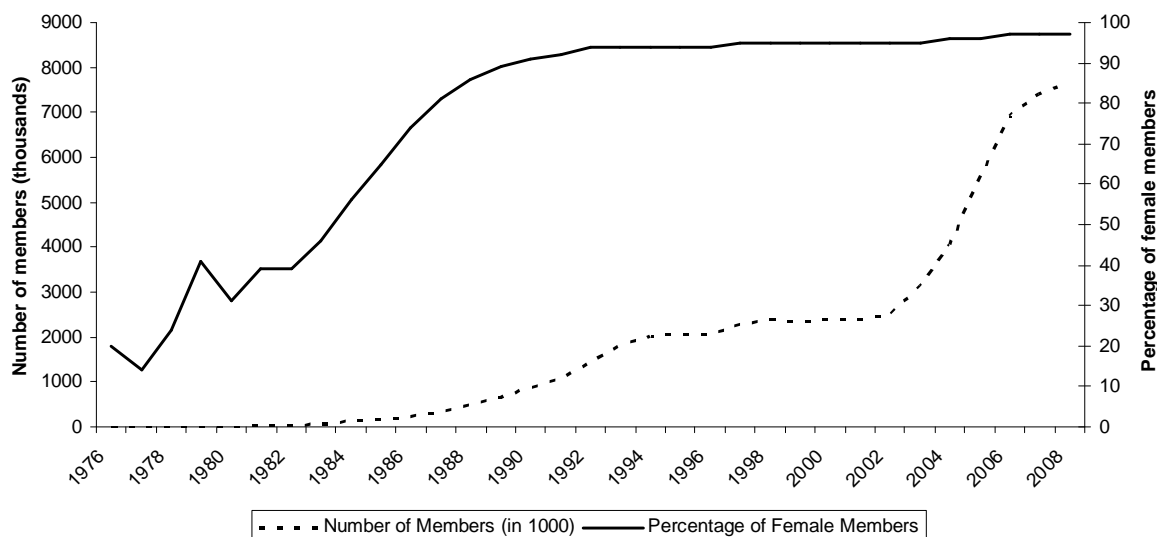
The link between chapter 3 and 4 is that without the designs employed to make the credit market in developing countries behave as a normal credit market, the base for microcredit would not be there, and no further discussion would be necessary.

Chapter 4

4.0 Microfinance and women

Targeting women has been named as one of the main reasons for the success of microfinance. As mentioned in chapter 2, women make up 97 percent of the Grameen Bank's clients, but this has not always been the case. As figure 3 shows, the percentage of female participants in the Grameen Bank microcredit programme has risen from 46 percent in 1983 to 97 percent in 2008¹⁷ (Grameen Bank, 2009).

Figure 3 – Share of female membership in Grameen Bank, 1976–2008



According to The State of the Microcredit Summit Campaign 2009, women make up 83.2 percent of the 106.6 million poorest clients reached end of year 2007 (Daley-Harris, 2009). Dr. Yunus and the Grameen Bank did not initially target women as clients. As mentioned in chapter 2, the strategy evolved as a result of the better results female groups produced in terms of repayment than the male groups. Social and religious barriers were also in the way, but now most of these barriers seem to have been overcome. But why should the Grameen Bank target women with their loans?

¹⁷ The Grameen Bank became an independent bank in October 1983.

4.1 Targeting women

Traditionally, both in developed and in developing countries, men has been the typical target for credit institutions. The reason is simply that men have normally controlled land and other assets used as collateral. When “normal” collateral is out of the equation, other explanations must be found. Experience taught the Grameen Bank that women had better repayment records than men (i.e. Armendariz de Aghion and Morduch, 2005), and a transition towards wanting female clients seems rational for a financial institution that aimed for sustainability. Other explanations are found based on development theory. Khandker (2003) found that a 10 percent increase in male borrowing would increase household non-food expenditure by 0.2 percent, and in contrast the same increase in female borrowing would lead to an increase in non-food expenditure by 0.5 percent, *in addition* to an increase in food expenditure (0.1 percent) and household non-land assets (0.2 percent). Thus, from a poverty reduction view it seems that targeting women increases household welfare.

Other explanations to why women are the preferred clients may also be found. Poverty, mobility and risk are factors that determine why they might be better customers for an MFI. Women make up the largest share of the poorest poor, approximately 70 % according to the UNDP Human Development Report (1996), so among the target group based on poverty indicators one will find an overrepresentation of women. This is also supported by the findings of Quisimbung, et al., (2001), who find that female headed households are generally worse off than male headed households in Bangladesh.

Available wage-giving work in rural areas of developing countries is often characterized by physical labour, in which men have a comparative advantage over women. Therefore women are more or less banned from the existing labour market, and microcredit might help them towards setting up microenterprises from their homes, such as mobile phone operators; sowing and mending etc. Morduch (1999) argues that because women are less mobile than men, there is also a reduced risk of moral hazard. If the loan officers come to the home of a family in rural areas of developing countries, chances are that the husband is out working while the wife is at home. Women are also considered to be more conservative with their investments, and they are often more compliant towards their obligations towards the lender (Armendariz de Aghion and Morduch, 2005)

Armendariz de Aghion and Morduch (2005) show that other social factors such as decreasing fertility rates and increasing female literacy rates have helped microfinance on its way towards serving women, respectively increasing women's available time to venture into a microfinanced project and of course widen the opportunities to participate in other spheres of society. Fertility rates in Bangladesh have dropped nearly 50 % from 1980 to 2000, and it is uncontroversial to state that this has had a positive effect in reducing the time needed to perform domestic work.

The World Bank stated in the 2001 World Bank Report that gender equality will strengthen developing countries ability to reduce poverty, as well to grow and govern efficiently. The prevailing view is that access to credit can empower women, and many MFIs have set up female awareness and educational programs interlinked with their credit programs. I show that women are not necessarily allowed to have access to microcredit by their husband, and this may explain why the market in Bangladesh shows signs of saturation at a market penetration percentage of only 35¹⁸. To evaluate this further, we have to assess how decisions within families are made.

Empowerment is not an easy concept to explain. Goetz and Sen Gupta (1996) challenged what they saw as the then prevailing view that demand and propensity to repay loans could be used as proxies for increased female control and empowerment. Their qualitative survey finds that 37 percent of the 253 interviewed women in their study reported that they had full or significant control over their received credit. 39 percent reported no or very limited control, the rest stated that they had only partial control. This means that even though one target women especially, the majority of the women in this study did not fully control the investment made possible by the credit.

In the following I will use increased bargaining power within the family as an argument for female empowerment.

¹⁸ The Asia Microfinance Analysis and Benchmarking Report 2008 reports a growth in new borrowers of 3.3 million from 2006 to 2007, so the market does not show clear signs of saturation yet..

4.2 Household Decision Making

In the discipline of family economics, household decision making has been given considerable attention. This must also be the case when one evaluates the decision to target women with microcredit.

Starting with the notion that a family behaves like a single unit in deciding which actions to undertake, we may evaluate how access to microcredit affects the family. Becker (1981) (sited in Armendariz de Aghion and Morduch, 2005), assumes that male and female preferences may be aggregated into one household objective function. This approach is only focusing on efficiency, and does not focus on the intra household distribution of income. Instead, it focuses on allocation of the individuals within the family to gain from comparative advantages. Armendariz de Aghion and Morduch (2005) argue that this model may be applicable to families in developing countries, and that within a family gender related comparative advantages result in men taking paid physically demanding work outside the home, while women perform unpaid work at home. Estimates based on data from 1990 collected and presented by the UNDP Human Development Report 2003 suggest that males in rural Bangladesh spend 70 percent of their time on market activities, while females spend 65 percent of their time on non-market activities. These numbers do not differ very much from numbers found in OECD-countries such as the United States, Norway and Germany, but at least it shows that women spend more of their working hours on non-market labour than men.

If one takes it as given that the family acts as one single unit which undertakes all decisions and projects in unity and under full consensus, then targeting by gender would not be that important from a poverty alleviation view. Since how the consensus is created is of no importance, the same applies with a dictatorial head of family (Armendariz de Aghion and Morduch, 2005). The family would undertake the project together, and allocate the person who would ensure the best total outcome for the family to the project.

However, more recent views on household decision making show that within a family there is not necessarily consensus in every decision (e.g. McElroy and Horney, 1981 and Lundberg and Pollak, 1993). If the findings of Khandker (2003) cited in section 4.1 are to be relevant, household decisions must take another form than in Becker's unitary model.

4.2.1 Bargaining Models

By “opening up” the family, and evaluating underlying factors in household decision making, we might see how targeting women affect their bargaining power. If the bargaining power increases, this might be seen as a way to empower women within the family.

In contrast to the unitary model, we have a bargaining model with divorce as the “threat point” (e.g. Manser and Brown, 1980). The divorce threat bargaining model opens for different utility functions within a family model. The credibility of such a threat depends on such as social norms; formal legislation and other income opportunities. In rural Bangladesh, this credibility is not strong. Women depend on their husbands to secure monetary income, and the social stigma is worse for a divorced woman and her family than for a divorced man (Alam, et al.). It is therefore not as likely that the wife can make a credible threat to leave the household as in developed countries, and thus I will not address the divorce threat bargaining model further. Accepting that in Bangladesh and in much of the developing world gender roles are more “traditional”, I will focus on a model which is more applicable to societies where women are strongly dependent on men.

I will in the following concentrate on a version of the “separate spheres” bargaining model introduced by Lundberg and Pollak (1993). In this model, the threat point is not divorce, but a non-cooperative equilibrium within the marriage. By living in separate spheres, the married couple will still live under the same roof, but they will not receive the extra utility gain cooperation brings. In a cooperative state, supply of public goods consumed by the entire household could explain utility gain. In the non-cooperative equilibrium the support of public good is expected to be lower. Specialisation in market and non-market labour may represent the separate spheres of marriage, where in patriarchal societies the wife typically produces non-market services, and the husband works for the available market wage.

The model, developed by Christensen (2007), builds on Van Tassel (2004) but is simplified to only one investment opportunity. This is to evaluate not which investment opportunity is made, but rather to see under which circumstances any investment will take place.

The household consists of a husband and a wife; $i = h, w$. They derive utility from consuming a household good z . This good is produced with inputs monetary expenditure x and domestic

service y . Other names for domestic service may be domestic work or non-market labour. The technology is taken from Van Tassel (2004):

$$z = \begin{cases} x_i + y_i & \text{When } x_i > 0 \\ 0 & \text{Otherwise} \end{cases} \quad i = h, w \quad (7)$$

The properties of the technology are important for the following analysis. The technology reflects that the consumption good is a positive function of both inputs, and that domestic service cannot be the only input. Monetary income is required for survival, and with $x = 0$ the household will have no possibility to pay for life-necessary items such as medicines. We assume the husband specializes in the labour market ($y_h = 0$), and bring home a fixed monetary expenditure $x_h > 0$. This assumption rests on the structure of the rural labour market in developing countries, where available market work often favours comparative differences between genders such as physical strength. The technology also reflects what could be seen as a strongly patriarchal society, where the husband controls income. The wife can either specialize in domestic service $x_w = 0$ and $y_w = y$, or diversify by investing in a project financed by an MFI. When she shares her time between the project and domestic service, the domestic service production is then $y_w = y'$, where $y > y' > 0$ because she still needs to perform her basic domestic service since the husband uses his available time on producing monetary expenditure. The individual's utility function is given by:

$$u_i(z_i) = \eta z_i \quad \eta > 1, i = h, w \quad (8)$$

The total consumption good z is divided between the husband and the wife through a Nash bargaining game with a non-cooperative equilibrium as threat point. The utility function from equation (8) is the individual's utility gain from finding a cooperative solution, where η represents the utility gain of cooperating. If the husband and wife cannot agree, they stay married, but in a non-cooperative state. Each will then receive their reservation utility where consumption equals personal income $\bar{u}(z_i) = z_i$. The reservation utility may be understood as when the husband can choose to use his monetary income entirely on himself, and not share with his wife. The wife's reservation utility would in this case be equal to zero given the

properties of the technology. This bargaining game is solved by the individual utilities that solve the problem:

$$\max_{u_h, u_w} (u_h - \bar{u}_h)(u_w - \bar{u}_w) \quad \text{s.t. } u_h + u_w = \eta z$$

Solving the problem:

$$L = (u_h - \bar{u}_h)(u_w - \bar{u}_w) - \lambda(u_h + u_w - \eta z)$$

F.O.C.

$$(i) \quad (u_w - \bar{u}_w) - \lambda = 0$$

$$(ii) \quad (u_h - \bar{u}_h) - \lambda = 0$$

$$(iii) \quad (u_h + u_w - \eta z) = 0$$

From the first order condition we find that $u_h^* = \frac{1}{2}[\eta z + \bar{u}_h - \bar{u}_w]$, and by substituting for z we have the following two utility functions for the husband and wife:

$$u_h^* = \frac{1}{2}[\eta(x_h + x_w + y_h + y_w) + \bar{u}_h - \bar{u}_w] \quad (9)$$

$$u_w^* = \frac{1}{2}[\eta(x_h + x_w + y_h + y_w) - \bar{u}_h + \bar{u}_w] \quad (10)$$

Equation (3) is easily derived from (2) because of the imposed symmetry.

The husband's domestic service y_h is always zero. If the wife specializes in domestic service, the reservation utility is $\bar{u}_w = 0$, as monetary income is required to consume the good z (see the properties of the technology in equation (8)).

Now let us look at the situation where the wife has the opportunity to apply for a loan with an MFI. To ensure concavity and that extra effort put into the project yields better outcome, let us assume that the monetary expenditure function takes the following form:

$$x_w = r \ln(1 + e_w) \quad (11)$$

The variable project return r is the value of the project financed by the microcredit. The project return may vary because of the quality or expected return of the chosen project, or simply because of the quality of the effort put into the project. Two women may choose the same project, but the return can be greater for one because she is more talented. The net return on the investment is an increasing but concave function of the effort she puts into the project, e_w . Concavity is ensured by the properties of the natural logarithm, and the decreasing marginal productivity tells us that one woman working 10 hours on a project will not produce as much income as two women working 5 hours each. Total available time is normalised to 1, and time spent on the project means less time available to perform domestic service y_w . Domestic service is assumed to have a linear production function, given by.

$$y_w = y(1 - e_w) \quad (12)$$

If she specializes in the project, the effort is $e_w = 1$ and she will not produce any domestic service. When she specializes in domestic service, y_w will be equal to y .

The timing of the different stages in the bargaining game is important for the results

1. The wife first decides if she will apply for a loan.
2. Then she decides on her optimal provision of effort put into the project.
3. The husband and wife produce their x_i and y_i .

The bargaining game starts after both have produced their x_i and y_i . The wife will only increase the effort put into the project as long as her marginal utility from the project exceeds the marginal utility from her domestic service; i.e. until $\frac{\partial u_w^*}{\partial e_w} = 0$. We insert the new values

from equations (11) and (12) into the utility function for the woman (10):

$$u_w^* = \frac{1}{2} [\eta(x_h + r \ln(1 + e_w)) + y_h + y(1 - e_w)] - \bar{u}_h + \bar{u}_w$$

$$\frac{\partial u_w^*}{\partial e_w} = 0 \Rightarrow \left[\frac{r}{1 + e_w} - y \right] = 0$$

Solving for e_w :

$$e_w = \frac{r - y}{y} \quad (13)$$

With time normalised to 1, the validity of this is limited to the space $r \in \langle y, 2y \rangle$. If the investment in the project has lower payoff than this, the wife will choose an effort e_w marginally larger than zero, but still invest. The reason for this is the properties of the production function for the consumption good – we know that domestic service yields no consumption without income. Consumption of good z_i depends on x_i strictly being larger than zero. To see this formally, let us assume that the effort invested when $r \in \langle 0, y \rangle$ is ε , and that $\varepsilon > 0$. This gives us the following expression for optimal effort:

$$r \in \langle 0, y \rangle \Rightarrow e_w = 0 + \varepsilon \quad (14)$$

The money expenditure function and the domestic service function then take the following form:

$$\begin{aligned} x_w &= r \ln(1 + \varepsilon) > 0 \\ y_w &= y(1 - \varepsilon) \end{aligned} \quad (15)$$

Our production function is now:

$$z_i = r \ln(1 + \varepsilon) + y(1 - \varepsilon)$$

We need to find the wife's reservation utility for low project return rates ($r \in \langle 0, y \rangle$):

$$\lim_{\varepsilon \rightarrow 0} z_w = y$$

When the wife specializes in domestic service she has a threat point equal to zero, but a loan that generates income gives all her domestic service a value in the household bargaining game.

Inserting the optimal effort from equation (13) in the utility function from equation (10), we can estimate the change in utility for both agents after the loan has been made available (C-credit, N-no credit).

$$u_w^{C*} = \frac{1}{2} \left[\eta \left(x_h + r \ln \left(1 + \frac{r-y}{y} \right) + y_h + y \left(1 - \frac{r-y}{y} \right) \right) - \bar{u}_h + \bar{u}_w \right]$$

Inserting values for the variables we know will simplify this expression:

$$u_w^{C*} = \frac{1}{2} [\eta(x_h + y) - x_h + y] \quad \begin{array}{l} r \in \langle 0, y \rangle \\ y_h = 0 \\ \bar{u}_h = x_h \\ \bar{u}_w = y \end{array} \quad (16)$$

In the absence of credit we have full specialisation; the wife will use all her time on domestic service and the husband will use all his time on producing monetary expenditure. We have $x_w = 0, Y_h = 0, y_w = y, \bar{u}_w = 0$ and $\bar{u}_h = x_h$, and this enables us to simplify u_w^{N*} :

$$u_w^{N*} = \frac{1}{2} [\eta(x_h + x_w + y_h + y_w) - \bar{u}_h + \bar{u}_w]$$

Which yields:

$$u_w^{N*} = \frac{1}{2} [\eta(x_h + y) - x_h] \quad (17)$$

The difference between u_w^{C*} and u_w^{N*} is now easy to calculate:

$$\begin{aligned} u_w^{C*} - u_w^{N*} &= \frac{1}{2} [\eta(x_h + y) - x_h + y] - \frac{1}{2} [\eta(x_h + y) - x_h] \\ u_w^{C*} - u_w^{N*} &= \frac{\eta(x_h + y) - x_h + y - \eta(x_h + y) - x_h}{2} = \frac{1}{2} y \end{aligned} \quad (18)$$

By doing the same exercise with $r \in \langle y, 2y \rangle$ and $r \in \langle 2y, \rightarrow \rangle$, we find the change in utility with access to credit for the different threshold values of project return r . First we take a look at the situation where $r \in \langle y, 2y \rangle$:

We know from equation (13) that when the project return is $r \in \langle y, 2y \rangle$, the wife will use effort $e_w = \frac{r-y}{y}$. This ensures that *in addition* to domestic service she will also receive the returns on the project, $x_w = r \ln \left(1 + \frac{r-y}{y} \right)$, as an accrument to her reservation utility. By inserting this in equation (10), we have the following expression:

$$u_w^{C*} = \frac{1}{2} \left[\eta \left(x_h + r \ln \left(1 + \frac{r-y}{y} \right) + y_h + y \left(1 - \frac{r-y}{y} \right) \right) - x_h + \left(y \left(1 - \frac{r-y}{y} \right) + r \ln \left(1 + \frac{r-y}{y} \right) \right) \right]$$

By simplifying and inserting for known values we find:

$$u_w^{C*} = \frac{1}{2} \left[\eta \left(x_h + r \ln \left(\frac{r}{y} \right) + 2y - r \right) - x_h + \left(2y - r + r \ln \left(1 + \frac{r}{y} \right) \right) \right]$$

Which yields:

$$u_w^{C*} = \frac{1}{2} \left[\eta \left(x_h + r \ln \left(\frac{r}{y} \right) + 2y - r \right) - x_h + \left(2y - r + r \ln \left(1 + \frac{r}{y} \right) \right) \right] \quad (19)$$

We then subtract the no-credit utility equation (17) from equation (18):

$$\begin{aligned} u_w^{C*} - u_w^{N*} = & \\ & \frac{1}{2} \left[\eta \left(x_h + r \ln \left(\frac{r}{y} \right) + 2y - r \right) - x_h + \left(2y - r + r \ln \left(1 + \frac{r}{y} \right) \right) \right] \\ & - \frac{1}{2} [\eta(x_h + y) - x_h] \end{aligned}$$

Which yields

$$u_w^{C*} - u_w^{N*} = \frac{1}{2} \left[(\eta + 1) \left(\ln \frac{r}{y} - 1 \right) r + 2y + y\eta \right] \quad (20)$$

The same process is repeated for project return $r \in \langle 2y, \rightarrow]$, where the wife's effort in the project is equal to 1, that is she specializes in the project and produce no domestic service ($r \in \langle 2y, \rightarrow] \Rightarrow e_w = \frac{2y-y}{y} = 1, y_w = 0$):

$$u_w^{C*} = \frac{1}{2} [\eta(x_h + r \ln(1 + e_w)) + y_h + y(1 - e_w)] - \bar{u}_h + r \ln(1 + e_w)]$$

$$u_w^{C*} = \frac{1}{2} [\eta(x_h + r \ln 2) - x_h + r \ln 2] \quad (21)$$

Again we subtract the no-credit utility (17) from (20):

$$u_w^{C*} - u_w^{N*} =$$

$$\frac{1}{2} [\eta(x_h + r \ln 2) - x_h + r \ln 2] - \frac{1}{2} [\eta(x_h + y) - x_h]$$

Which yields:

$$u_w^{C*} - u_w^{N*} = \frac{1}{2} [r(\eta + 1) \ln 2 - y\eta] \quad (22)$$

To summarize, these are the utility gains for the wife for the different threshold values of r (equations (18), (20) and (22)):

$$r \in \langle 0, y] \quad u_w^{C*} - u_w^{N*} = \frac{1}{2} y$$

$$r \in \langle y, 2y] \quad u_w^{C*} - u_w^{N*} = \frac{1}{2} \left[(\eta + 1) \left(\ln \frac{r}{y} - 1 \right) r + 2y + y\eta \right]$$

$$r \in \langle 2y, \rightarrow] \quad u_w^{C*} - u_w^{N*} = \frac{1}{2} [r(\eta + 1) \ln 2 - y\eta]$$

As mentioned before, the validity is limited to the space $r \in \langle y, 2y]$. In the space $r \in 2y, \rightarrow]$ the wife will use all her effort on the project, and there will be no one to attend to production of domestic service¹⁹.

¹⁹ Domestic service could be purchased if the project yields high enough revenue. It is though more realistic that there is a minimum of domestic service that the wife will have to produce when we are looking at very poor families.

The wife will always be better off if she receives a loan and control the revenue from the project. Increase in household revenue will increase the utility possibility frontier of the household, and her increased bargaining power assures that she can get a greater share of the household revenue. In a society where a woman normally must rely on her husband's salary as the only source of income, access to microcredit is the opportunity that might spur the increase in bargaining power.

The husbands change in utility from his wife's investment in a micro-financed project is given by:

$$r \in \langle 0, y \rangle \quad u_h^{C^*} - u_h^{N^*} = -\frac{1}{2}y \quad (23)$$

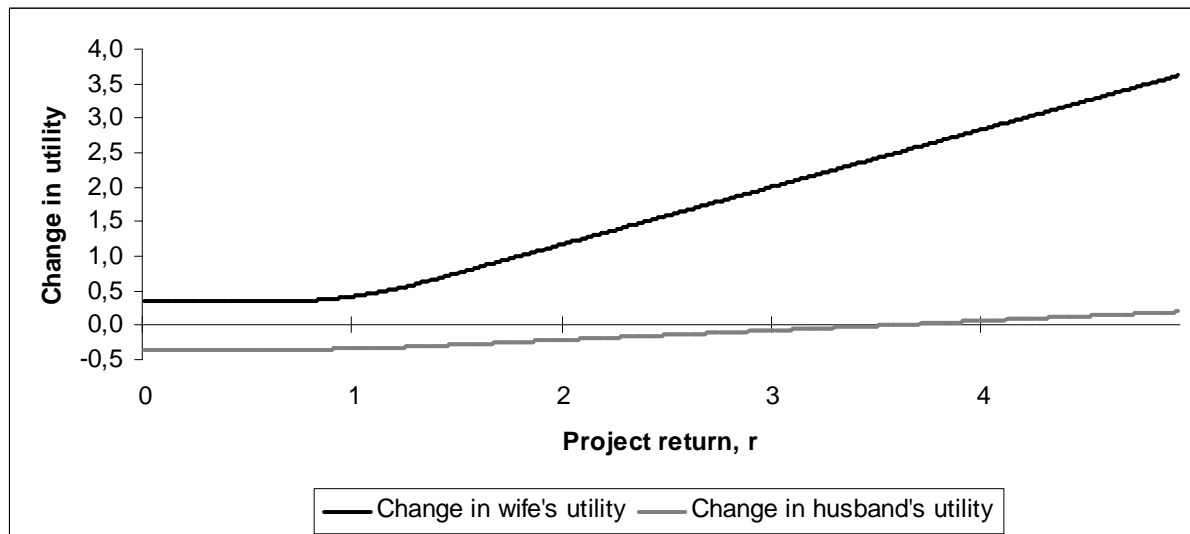
$$r \in \langle y, 2y \rangle \quad u_h^{C^*} - u_h^{N^*} = \frac{1}{2} \left[(\eta - 1) \left(\ln \frac{r}{y} - 1 \right) r - 2y + y\eta \right] \quad (24)$$

$$r \in \langle 2y, \rightarrow \rangle \quad u_h^{C^*} - u_h^{N^*} = \frac{1}{2} [(r(\eta - 1) \ln 2 - y\eta)] \quad (25)$$

For project revenue $r > 0$, the husband loses relative bargaining power as the wife gains relative bargaining power. For small revenues, the household's income is practically the same, and as the profitability increases beyond the value of domestic service y the husband's loss in bargaining power is compensated by an increase in consumption due to an increase in total household income.

Inserting for values $y = 0,7$ and $\eta = 1,4$ we have the changes in the wife's and husband's utility illustrated in figure 4.

Figure 4 – Change in utility with access to credit



With a small return on the project (for small values of r), the drop in the husband's utility is equal to the gain in utility for the wife. Only if her project generates enough income will the husband experience positive utility from his wife obtaining a loan. From the figure we have in the interval $r \in \langle 0, y \rangle$ a 0.35 increase in the wife's utility, and the same decrease in the husband's utility. This tells us that for small project return rates, the effect from the microcredit is only an intra household reallocation of utility.

In the next interval $r \in \langle y, 2y \rangle$ the wife's utility gain increases with the revenue of the project, and because of the household's increased total consumption, the husband's utility loss is smaller. In the example, the project's revenue has to be at least 3.54 for the husband to not experience a utility loss of his wife participating in a microcredit program.

These results indicate that there is a potential conflict within the family when it comes to the decision to participate in a microfinance program. Cultural and social norms are determinants for our results, and decide if the wife will have access to microcredit. The model indicates that the wife's project needs a relatively high return for the husband to approve of the loan without sacrificing utility.

Worst-case scenario from the model is that the project generates no return, and that total household revenue remains unchanged. The wife could therefore transfer some of her gained utility (in the model this is understood as money) to negotiate with her husband. She could

compensate his utility loss so he will grant her the possibility to borrow the needed funds for the project. This, however, relies on the wife's possibility to commit to a binding contract for a future transfer of money. Several papers in family economics argue that binding contracts of this sort seldom appears within marriages (e.g. Lundberg and Pollak, 1993), and that the wife will have incentives to break the agreement ex-post. In a patriarchal society, with less attractive alternatives outside marriage for women than men (Alam., et al., 2000), this commitment to ex-post transfers is however more credible.

If the husband does not believe that the expected project return rate exceeds the value of domestic service in the model, then he will have no incentives to allow his wife access to microcredit without such a promised transfer. And if we assume that binding contracts do not exist, the husband will not allow his wife to participate in the microcredit program.

An alternative cause of action is to transfer control of both the loan and the revenue to her husband. The household will still receive higher total income as long as the wife is the one working on the project. This is indeed what seems to happen in the majority of the households investigated by Goetz and Sen Gupta (1996). In the same article there are accounts of how far the Grameen Bank is willing to go to ensure that the initial use of the microloan is not transferred to the husband, for instance by accompanying the female borrower to the market to help her buy for instance a cow.

How does this argument affect MFIs policies? The MFIs argue that targeting women is both more efficient since they are more reliable, and that it empowers women. Based on the argument presented in the model, it is easy to see that female empowerment, defined as increased bargaining power, is a possible outcome in the base model. When one take into account that in many strongly patriarchal societies a woman cannot take these decisions without her husband sanctioning it, the result can be that the wife's utility only increases when the revenue from the project reaches a certain level. MFIs may in these cases experience that targeting women work in the opposite direction than the objective – i.e. that they will not be granted access to credit markets since it does not directly benefit the husband, and that women will not be empowered despite the efforts and mechanisms designed to help in that direction. Research conducted by for example The World Bank (2001) states that empowerment of women, combined with their stronger preference for nutrition, health and education for the entire household, leads to the multiplier effect also observed by Khandker

(2003). Empowerment of women, in the sense of providing them a larger say in the household's dispositions, will lead to a higher investment in human capital of their children.

However, if the wife needs her husband's consent in order to apply for a loan, policies aimed to ensure that the loan is controlled by the woman might prevent the household from applying for a loan that could raise their welfare through total income. In societies where the husband is able to deny his wife access to microcredit programs, the same mechanisms used to secure the multiplier effect might prevent the possible wealth increase for the household. The argument is supported by the analysis in section 4.2, which shows that the potential intra household empowerment of the wife leads to a drop in utility for the husband.

The wife could of course transfer the control over the loan to the husband in a bargaining game that gives her access to other opportunities and activities made available by the MFI. Such opportunities could be training; a social arena outside home; health education or other education. This could be modelled in a multi period game where the wife benefits from direct utility from increased income and a future increase in her reservation utility because of the skills acquired from the training supplied by the MFI. However, the same mechanisms designed to make the household spend the loan on the woman would be applicable to this situation also.

The deciding factor of the outcome when the husband can in fact deny his wife access to credit programs is the MFI's goals. If the goal is female empowerment, improving her bargaining power by lending her as much as possible will yield better results. If the goal is to alleviate poverty, the best policy depends on whether the multiplier effect from empowering women dominates the direct effects from increasing household income, even though this income is fully controlled by the husband.

The gender bias in modern microfinance also implies that a large share of the population is automatically excluded from the market. Granting credit to women means that the male share of the poorest of the poor has to look elsewhere to obtain credit or not receive any credit at all. This distributional effect could conflict with the poverty alleviation goal if there were no restrictions on distribution, such as funding, manpower etc.

Chapter 5

5.0 Conclusion

The backdrop of this thesis is the increasing interest microfinance has generated both among scholars, politicians and media over the last decades. To begin with I provided some basic background data on microfinance growth and outreach. I also presented a short review of the Grameen Bank and the Grameen type credit, with its ground breaking group-lending methodology.

I have addressed the main challenges microfinance institutions are facing when entering a rural market in developing countries. These challenges arise because of the absence of seizable collateral, adverse selection, moral hazard and competition.

Assuming that riskiness is inherent and heterogeneously dispersed amongst borrowers, we have seen that individual contracts under asymmetric information may lead to adverse selection and a substantial raise in required interest rate. We have also provided a numeric example that shows how the aggregate social surplus is halved when the safe borrowers decide to leave the market when the risky borrowers default more often. Mitigating adverse selection is shown to be possible through the group formation game, where borrowers of the same risk profile group together.

The actions performed by the borrower after receiving the loan have also been analysed using standard theory. Both ex-ante and ex-post moral hazard are problems that have to be taken seriously, and peer monitoring, social sanctions and dynamic incentives are all solutions designed to diminish the problem.

The rather curious effects of competition - curious at least for economists - have been addressed. One proposed solution was that microfinance institutions, both client- and profit-maximizing, should have access to necessary client data through some kind of centralized system.

After reviewing the problems and solutions that have been assessed, analyzed and tested by acknowledged and merited scholars, we turned to an analysis of the empowerment goal. The simple model sought to explain the conflict between empowerment and incentives in a strongly, patriarchal society. We found that the shift in bargaining power might make the husband worse off than without the microcredit participation. The results from the analysis showed that the husband have incentives to deny his wife access to microcredit programs when the expected return on the connected project is low.

Some microfinance institutions and policy makers have argued that the gained multiplier effect from empowering women may lead to a stronger long-term wealth effect for the household. This effect is fuelled by the women's propensity to invest more in children's education and health. Mechanisms designed to ensure that women remain in control of their loans may actually conflict with the poverty alleviation goal.

The analysis aside, the female empowerment goal has merit. Both theoretical and empirical findings support the multiplier effect. Policy recommendations are very difficult to offer in a field that encompasses social and cultural factors that are not easy to model. The contribution this thesis offers must thus be that under very simple assumptions, targeting women with microcredit is not optimal in all situations. Microfinance institutions might benefit from adopting more flexible approaches, so that female empowerment does not end up conflicting with reducing poverty.

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