

Dipartimento di Impresa e Management

Cattedra: Prospettive Macroeconomiche Globali

TITOLO

Risk Management in Microfinance Sector.

RELATORE:

Prof. Giovanni Ferri

CANDIDATO

Alejandro Arregui

Matr. 645221

CORRELATORE

Prof.ssa Gloria Bartoli

ANNO ACCADEMICO: 2012/2013

Table of Contents

Risk Management in Microfinance Sector	1
Introduction	5
1 Microfinance	9
1.1 The nature of Poverty and Financial Inclusion.....	9
1.2 Credit market in development	14
1.3 What is Microfinance? A definition	21
1.4 The origins of Microfinance	23
1.5 Group lending and the use of information	24
1.5.1 Adverse Selection	32
1.5.2 Moral Hazard.....	34
1.5.3 Costly state verification	36
1.5.4 Enforcement	38
1.6 Innovations on group lending	41
2 Risks in Microfinance	44
2.1 Categories of Risks in Microfinance	45
2.1.1 Other risks faced in Microfinance.....	52
2.2 Risk Management process in Microfinance	53
2.2.1 Some general principles for Risk Management in Microfinance	55
2.2.2 Developing a Risk Management System.....	65
3 Case: Compartamos Banco.....	73
3.1 Overview	73
3.2 Funding	77
3.2.1 Equity	79
3.2.2 Bank and other loans	80

3.2.3 Deposits Funding	81
3.3 Products	81
3.3.1 Credits	82
3.3.2 Insurance	85
3.4 Risk Management	86
3.4.1 Credit risk	87
3.4.2 Market risk.....	91
3.4.3 Liquidity risk.....	92
3.4.4 Operational risk	95
3.4.5 Technological risk	96
3.4.6 Legal risk	97
Conclusion	98
Bibliography	101

Tables and Figures Index

TABLE 1: FIGURES AS OF DECEMBER 31, 2010	7
TABLE 2: PROGRESS IN REPORTING, 1997-2010	7
FIGURE 1 DIMINISHING MARGINAL RETURNS TO CAPITAL	10
FIGURE 2 DETERMINE THE INTEREST RATE.	20
FIGURE 3 MYTHS OF MICROFINANCE.	23
TABLE 3 RISK CATEGORIES ACCORDING TO GTZ	46
TABLE 4 RISK CATEGORIES ACCORDING TO CHURCHILL AND FRANKIEWICZ	47
FIGURE 4 RISK MANAGEMENT FEEDBACK LOOP	57
FIGURE 5 STEPS IN RISK MANAGEMENT.....	66
FIGURE 6 CREDIT RATING METHODOLOGY BY MICRORATE	67
FIGURE 7 CREDIT RATING GRADES.....	70
FIGURE 8 RISK MEASUREMENT SYSTEMS	71
FIGURE 9 COMPARTAMOS GROUP PRESENCE IN AMERICA.....	77
FIGURE 10 COMPARC STOCK PERFORMANCE.....	79
FIGURE 11 COMPARISON CHART BETWEEN COMPARTAMOS STOCK (COMPARC) VS MEXICAN STOCK EXCHANGE INDEX FOR FINACIAL SERVICES (ST4000.MX).....	80
FIGURE 12 ATERNA (INSURANCE) IN NUMBERS	86
FIGURE 13 CLIENT DIVERSIFICATION BY INDUSTRY.....	88
FIGURE 14 CLIENT DIVERSIFICATION BY REGION.....	88
FIGURE 15 RATED PORTFOLIO IN 2012	89
FIGURE 16 REQUIRED ALLOWANCES FOR 2012 PORTFOLIO	90
FIGURE 17 ANALYSIS OF LIQUIDITY GAPS 2012	94

Introduction

The fight against poverty has taken many expressions. Over the last decade we have learn that there is no such thing as the magic bullet against poverty. The combination of many elements is what helps countries develop. Microcredit is just one of this elements, which together with other components, can create the environment for people to get out from the poverty traps.

There is a famous paper written by Hartmann and Boyce¹ in 1983 in which they tell the story of a poor family in Bangladesh. Abu, the father and head of the family, has contracted a serious illness which makes him unable to work. Since he is not working he does not receives any income, and without that income he won't have access to the medical treatment needed. He won't get better and has fallen into a poverty trap. As time goes by the family becomes poorer and poorer selling all what they have just to buy some rice to live that day. The only hope relies on the jackfruit tree Abu planted some years before. If only the tree was to give some fruit they could get to the local market and sell it easily. This would be enough to buy rice to feed them self and to save some extra for their other needs. At the end of the story Abu, in a desperate situation, chops down the tree and sells it as firewood at a very low price in the local market.

The questions that comes spontaneously is why did they chop down the tree that was their only hope, the only source of possible income. If they could have only asked some to lent them some money until the time the tree gave fruits. Once this happened the could have pay back for the money lent and even improve their situation. This leads to the fact that credit markets are not available to everyone or if available they have many restrictions and at high costs. Microcredit presents itself as an innovative instrument to give this people the

¹ B. Hartmann and J. K. Boyce, *A Quiet Violence: View from a Bangladesh Village* (Zed Press, 1983), 160.

chance to get out of poverty. It is about giving loans to poor people according to their capacity of repayment, in small amounts, at reasonable interest rate. In many rural areas some access to credit already exist in local moneylenders, but the access is not equivalent for everyone and the interest rates in general are very high.

Microfinance and in particular microcredit have proven itself to be of great help to fight against poverty over the last decades, but we still have a long way to go in this battle. We can imagine that Professor Yunus had no clue where this idea would go when he started making small loans to local villagers in the proximities of the university where he taught. There was at the time evidence of some state-own banks who were trying or had tried to address the poverty problem that way. Some of them had even made the situation worst, leaving behind them a legacy of inefficiency, corruption, and millions of dollars of misspent subsidies. Even the basic economic theories advised not to lent to low-income households that lack of collateral to secure their loans.

But innovation in the way approaching the problem and learning from other types of contracts, such as RoSCAs (Rotating Savings and Credit Associations) and Cooperative banks, led to group lending contracts in microcredits. This nontraditional contracts were used to compensate for risks and to address information problems faced by the microlenders.

Today the movement has spread globally. According to the State of the Microcredit Summit Campaign Report 2012 (Table 1), the number of Microfinance Institutions (MFIs) are 3,652. Serving a total number of clients of 205,314,502 worldwide. They are served by microfinance institutions that are providing small loans without collateral, collecting deposits and selling insurance, all customers who had been written off by commercial banks as being un-profitable.

Table 1: Figures as of December 31, 2010

Data Point	Finding
Number of MFIs Reporting (data from 12/31/97–12/31/10)	3,652
Number of MFIs Reporting in 2011 (data from 12/31/10)	609
Percent of Poorest Clients Represented by MFIs Reporting in 2011	56.5%
Total Number of Clients (as of 12/31/10)	205,314,502
Total Number of Women (as of 12/31/10)	153,306,542
Total Number of Poorest Clients (as of 12/31/10)	137,547,441
Total Number of Poorest Women (as of 12/31/10)	113,138,652

Source: Microcredit Summit Campaign Report 2012

Table 2: Progress in Reporting, 1997-2010

Date	Number of Programs Reporting	Total Number of Clients Reached	Number of Poorest Clients Reported
12/31/97	618 institutions	13,478,797	7,600,000
12/31/98	925 institutions	20,938,899	12,221,918
12/31/99	1,065 institutions	23,555,689	13,779,872
12/31/00	1,567 institutions	30,681,107	19,327,451
12/31/01	2,186 institutions	54,932,235	26,878,332
12/31/02	2,572 institutions	67,606,080	41,594,778
12/31/03	2,931 institutions	80,868,343	54,785,433
12/31/04	3,164 institutions	92,270,289	66,614,871
12/31/05	3,133 institutions	113,261,390	81,949,036
12/31/06	3,316 institutions	133,030,913	92,922,574
12/31/07	3,552 institutions	154,825,825	106,584,679
12/31/09	3,589* institutions	190,135,080	128,220,051
12/31/10	3,652 institutions	205,314,502	137,547,441

* The small increase in the number of institutions reporting December 31, 2009 data is due, in part, to the fact that we subtracted from the list of "practitioners" more than 88 Networks who assist with the collection of practitioner action plans but have no clients themselves.

Source: Microcredit Summit Campaign Report 2012

As any other banking activity, lending is about assuming risk and managing it. Risk management is at the core of banking. The main questions that arises when approaching microfinance the first time is, how can they manage to maintain their non-performing loans rates so low, if microfinance is about providing financial services to poor households with no collateral, most of them working in the informal

sector, were the risk of just taking the money and running is very high.

This work has the objective to help understand this phenomena. Where does it comes from, but also where are we heading to. We will started by explaining what is microfinance and its origins in chapter 1. Making a particular focus on why is microfinance important for economic development.

In the second chapter we will describe the main risks that a MFI has to face. In a particular way we will underline the difference between traditional risk management in a normal commercial bank and the risk management that has to be done by a MFI.

The last chapter we would like to use the Compartamos Banco experience to explain better how MFIs have to deal with the different risks. We have chosen Compartamos Banco because since their IPO in 2007 they have change the way MFIs normally fund their activities. Many authors have seen in this a landmark for the microfinance industry that rely mainly on grants from international development funds. The transaction has given a significant boost to the credibility of microfinance in commercial capital markets and accelerate the mobilization of private capital for the business of providing financial services to poor and low-income people.

1 Microfinance

This first chapter has the objective to introduce to the microfinance sector and its dynamics. We will start first by asking ourselves, why is microfinance needed? Why was it conceived in the first place? There are two important factors to answer these questions. First, the nature of poverty; and second, the role of credit in development economics. We will define the information problem that is faced by poor household and how does microfinance deals with this problem.

1.1 The nature of Poverty and Financial Inclusion

We began by asking why “microfinance” is needed in the first place. Why don't existing markets take care of the problems already? Why doesn't capital today flow naturally from richer to poorer countries, and from more affluent individuals to poorer individuals within a country? The problems largely center on market failures that are a consequence of poor information, high transactions costs, and difficulties in enforcing contracts.

We would like to start with a simple example. We can easily think that the production output of a rural farmer would highly increase when he starts to use his first tractor instead of using his ox. This change in technology requires a disbursement up-front to buy the tractor. Many farmers would change technology if they had access to that option. On the other hand we can compare the change in production output of this farmer with the change of production output of a big farming company when they add one extra tractor. Going from a one hundred to one hundred one, tractors. Probably the production output wouldn't change that much.

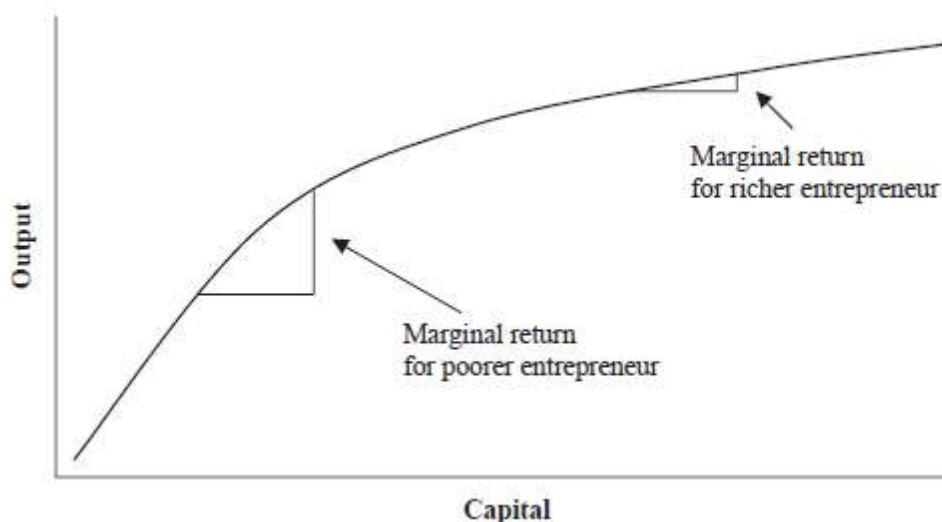
This is one of the first lessons in introductory economics, called the principle of diminishing marginal returns to capital, which says that enterprises with relatively little capital should be able to earn higher returns to their investments than enterprises with a great deal of

capital. Poorer enterprises should thus be able to pay banks higher interest rates than richer enterprises. Money should flow from rich depositors to poor entrepreneurs. The “diminishing returns principle” is derived from the assumed concavity of production functions.

When a tailor buys his first \$100 sewing machine, production can rise quickly relative to the output when using only a needle and thread. The next \$100 investment, say for a set of electric scissors, will also bring gains, but the incremental increase is not likely to be as great as that generated by the sewing machine.

The size of the incremental gains matter since the marginal return to capital determines the borrowers’ ability to pay. As figure 1 shows, concavity implies that the poor entrepreneur has a higher marginal return to capital (and thus a higher ability to repay lenders) than a richer entrepreneur. This means that the poorer entrepreneur, will be willing to pay a higher price for capital than the richer entrepreneur since he receives a higher return for that extra capital.

Figure 1 Diminishing Marginal Returns to Capital



Source: Armendariz and Morduch, *The Economics of Microfinance*

There is a famous paper written by Robert Lucas in 1990, which argues that borrowers in India should be willing to pay fifty-eight times

as much for capital as borrowers in the United States. This is known as the "Lucas Paradox". Money should thus flow from London to Bangladesh.²

According to this, capital should flow from rich savers to poor borrowers also within any country. The natural question that comes to our minds is: what is wrong with this basic rule of introductory economics? Why do large corporations find it easier to borrow money from banks than individuals who are self-employed? Why does international and local credit markets present this market failure?

The answer to these questions can be found in risk. Many consider investing in developed countries safer than investing in countries that are on their way to development. We can also think of it as an information problem. Global investors have neither the time, nor the right tools to gather information and to monitor their investments in developing countries. Costs of screening and monitoring investments to select and keep an update in small enterprises or individuals are much higher than the ones faced when investing in a large corporation.

In this way we can see how important information is in order to make investments safer. The lack of information of can explain why some lenders (such as commercial banks) have a very hard time serving the poor, even if we have seen that will be willing to pay more for those loans, for that extra capital. There are two important factors in this problem. One, the lender's side, we can realize that they do not have enough information on the borrower. They cannot see who is asking for money and what is the probability that they will return the money. Making this loan riskier. In the other side, the borrower's side, we have poor borrowers who have many investment projects but lack of the capital to realize them.

² Robert E. Lucas, "Why Doesn't Capital Flow from Rich to Poor Countries?," *The American Economic Review* 80, no. 2 (1990): 92–96.

This problem could be solved if the borrower gives some asset or property he owns as collateral. In this way the bank, even if they do not have enough information on the borrower, they can rely on the borrowers property if he fails to pay the loan. But since in this case, we are assuming the borrower is a poor person, this means he also lacks from any goods or property to give as collateral to the lender.

This particular information situation can be also seen as a classic adverse selection and moral hazard problem. Adverse selection presents when the bank is not able to separate good borrower from risky borrowers. If the bank knows the type of borrower they are dealing with, they would simply charge higher costs (which means higher rates) to riskier borrower in order to compensate for the extra risk that is taken. But the bank does not know who is who, and raising average interest rates for everyone often drives safer customers out of the credit market.

The second problem, moral hazard, arises because banks are unable to ensure that customers are making the full effort required for their investment projects to be successful. Moral hazard can also arise afterwards when the project has been finish and even if it has been successful the customer can try to escape with the bank's money. Weak judicial systems make it difficult to enforce contracts making this two problems worse.

If the bank would have a cheap way of gathering and evaluating information on the borrower who is asking for a loan, and if they had a simple and cheap way to enforce this contract, these problems could potentially be solved. This is why banks usually face high transactions cost when working with poor communities. This high transaction cost could be faced by the bank if the loan had such a size to cover this transaction costs. But when working in poor communities banks usually handle many small transactions making it far more expensive than servicing one large transaction for a richer borrower.

Solving this information problem could have a very high cost. This could be one of the reasons why informal lenders are more effective in poor areas. People in a local village know each other and they can overcome the information gap. Microfinance presents itself as the latest solution to the age-old challenge of finding a way to combine the banks' resources with the local informational of neighbors in a local community.

Governments have also tried to enter into serving the poor needs of credit through state owned banks or by subsidizing some rural banks. Most of them have failed to do so in a sustainable way. Critics of the subsidized state banks argue that poor households would often have been better off *without* the subsidies. This is in part because, first, subsidized banks pushed out informal credit suppliers on which the poor rely. Second, the market rate of interest is a rationing mechanism—those who are willing to pay for credit are only those with projects that are most worthy. But with subsidies driving interest rates well below market rates of interest, the rationing mechanism broke down. Credit was no longer allocated to the most productive recipients, but instead was often allocated on the basis of politics or social concerns. Good projects thus went unfunded. Third, bankers' incentives to collect savings deposits were diminished by the steady flow of capital from the government, so poor households were left with relatively unattractive and inefficient ways to save. Fourth, the fact that the banks were state banks led to pressure to forgive loans just before elections, to privilege the powerful with access to cheap funds meant for the poor, and to remove incentives for management to build tight, efficient institutions.³

The fundamental reason for imperfect or missing credit markets is that individuals cannot be counted upon (for reasons of strategy or luck) to fully repay their loans. If borrowers do not have deep pockets,

³ Beatriz Armendariz and Jonathan Morduch, *The Economics of Microfinance* (Cambridge, Mass: MIT Press, 2010), 11.

or if a well-defined system to enforce repayment is missing, then it stands to reason that lenders would be reluctant to advance those loans in the first place.

The poor are particularly affected, not because they are intrinsically less trustworthy, but because in the event of a project failure, they will not have the deep pockets to pay up. The poor may well possess collateral — a small plot of land or their labor — but such collateral may be hard to adequately monetize. A formal-sector bank may be unwilling to accept a small rural plot as collateral, much less bonded labor. But other lenders (a rural landlord, for instance) might. It is therefore not surprising to see interlinkage in credit transactions for the poor: a small farmer is likely to borrow from a trader who trades his crop, while a rural tenant is likely to borrow from his landlord. In short, the very fact of their limited wealth puts the relatively poor under additional constraints in the credit market.

1.2 Credit market in development

From another prospective, it is important to also talk about the implication of credit for economic development. In many economic activities are spread out over time. Most of them required investing today knowing that the payoff will come later in time. Income streams may fluctuate (because of seasonality or uncertain demand conditions), and such fluctuations will be transmitted to consumption unless they are smoothed through some form of credit. This is why credit markets play a very important role in an economy and especially in an economy that is on its way to development.

The sources for demand of credit can be divided into three different types: First, the capital required for new start-ups or a substantial expansion of an area in an existing company. For example adding a new production line or opening a new subsidiary. This capital is poured into the purchase and organization of fixed inputs such as

factories, production processes, machines, or warehouses. The credit market that serves these needs is called the fixed capital. Second, the capital that is needed for the ongoing production activity, which occurs because of a substantial time gap between the expenses required for production and sales receipts. This market is called the market for working capital. Finally, there is the consumption market, that is the credit required for immediate consumption, for example, buying food and clothes.

Fixed capital is fundamental for economic growth but working capital and consumption credit are of great importance for supporting the poor and disadvantaged. An example of this can be seen in agriculture where the crop cycle forces the peasant to begin by spending money in buying seeds, fertilizers, pesticides and other necessary material. These expenses must be up front, and farmers usually don't have enough resources to finance them. Hence, there is the need to borrow, with the loan repaid after crop is gathered and sold. He also has to eat and maintain his family all the way over the crop cycle.

When to this situation we add the seasonality and improbability surrounding the productive activity, consumption credit also takes great importance. The harvest might not have the results the farmer expected, weather may not be as good as predicted, affecting the farmer's earnings. Credit is required for such people to smooth consumption over time to cover their needs in periods of low income by borrowing against higher expected earnings during times when the going is good. This way in good years he'll save some money to spend in the bad years. Financial markets allow this allocation of resources over time and across states of nature. This is why credit markets are important for development.

There are already in place some actors that provide credit in rural or poor urban sectors. This can be divided into informal and formal lenders.

Informal lenders, information and collateral

It is common to find informal lenders such as other family members, close relatives or friends to which a person in need can ask for money. They have the advantage that they can rely on "soft" collateral. They may accept as collateral a small piece of land near their own piece of land. An employer may accept labor as a collateral. Or maybe a simple promise to repay. It is not surprising then, to find that formal banks cannot effectively reach out to poor borrowers, whereas informal money lenders – the land lord, the shopkeeper, the trader – do much better job in reaching out this people.

There is also another reason why informal moneylenders usually prevail. They often have much better information regarding the activities and the characteristics of the borrowers. This means that the moneylender is in a better position to choose to whom he shall lend money. He will lend the money to the ones he judges more capable of repaying, making an screening process based in his own first-hand information. He will also be in a better position to monitor his borrowers and to avoid moral hazard, during and after the lending process.

Institutional lenders

Many efforts had been done also by institutional of formal lenders, such as government banks, commercial banks, NGOs and so on. The main problem faced by this type of lenders that they do not have personal knowledge about the characteristic and the different activities of their clients. Often they cannot monitor how the loans that were given are being used. The main problem is not that the money goes to consumption instead of going to a productive project. There is a systematic divergence between what lenders want done with the money and what borrowers may wish to do with it.

The main problem is limited liability, meaning that the borrower can take the money and undertake riskier projects knowing that if the

project goes well they will have a higher outcome after paying the bank for the loan. If the project fails they will just declare bankruptcy and the bank will assume all the loss. The bank will like to prevent this risk from being taken; often it cannot. One way to prevent this risk is through collateral, but, as we mention before, poor peasant must of times lack of collateral or collateral if often of a very specific kind. A farmer may have a small quantity of land that he is willing to mortgage, but a bank may not find this acceptable collateral, simply because the cost of selling the land in the event of a default is too high. A laborer may also seek fund and pledge his labor as collateral: he will work off the loan. However, no bank will accept labor as collateral.

There are some characteristics we find in rural credit markets. These are the main characteristics that differentiate rural credit markets from normal credit markets.⁴

Informational constraints

We have already talked about this. To summarize the discussion so far, we may sum up that informational gaps occur at two basic levels. First, there is a lack of information regarding the use to which the loan will be put. Second, there is a lack of information regarding the repayment decision. This deficiency includes limited knowledge of the innate characteristics of the borrower that may be relevant in such a decision, as well as limited knowledge of the defaulter's subsequent needs and activities, which place limits on his incentive to default. All the important features of credit markets can be understood as responses to one or the other of these informational problems.

Segmentation.

This credit markets are many times based in personal relationships which take time to built-up. Local moneylenders may

⁴ D. Ray, *Development Economics* (Princeton University Press, 1998), 540.

have establish a circle of fixed clients to whom they lend on repeated basis. This clients are more likely to be within his village or from close by, so that the money lender has a close contact with them and is well informed about their activities. Repeat lending is a very common phenomenon.

Interlinkage

This characteristic may be considered as an extension of segmentation, it can be described as interlinked credit transactions. Most of village moneylenders are also wealthy landlords, shopkeepers, or traders. They tend to give credit mostly to their tenants or farm workers, whereas traders favor lending to clients from whom they also purchase. This interlocking of markets, people who conduct their business in different markets with the same trading partners, and terms in one transaction may well depend on the terms and conditions in the other.

Interest rate variation

The informal rates vary by geographical location, the source of funds, and the characteristics of the borrower. Sometimes interest rates are extraordinarily high, but sometimes they could be very low or even zero rate.

Rationing

Informal credit markets normally have an upper limit on how much a borrower receives from the lender.

Exclusivity

Economic transactions are mark by exclusive dealings. Moneylenders dislike situations in which borrowers take credit from other sources.

There is a common myth to think of moneylenders in a monopoly position charging very high interest rates. This is not always

true. Even if, as we have seen before, the market it segmented this doesn't necessarily means they operate on a complete monopoly. They may well have a "local monopoly" with some limits. The interlinkage can also explain the high interest, that must be seen in a different prospective. The lender's point of view is the surplus generation from the project, and he'll charge in form other than interest.

Figure 2 Determine the interest rate.

How to determine the interest rate, a simple model.

In the simplest version of the theory, there is an exogenous probability p of default on every dollar lent out. Competition between money lenders drives the rural interest rate down to the point where each lender on average zero expected profit (over and above the opportunity cost of fund to lenders). Consider a typical village moneylender in the competitive market. Let L be the total amount of fund he lends out, let r the opportunity cost of fund for every moneylender and let i be the interest rate charged in competitive equilibrium in the informal sector. Because only a fraction p of loans will be repaid, the moneylender's expected profit is $p(1+i)L - (1+r)L$. The zero profit condition implies that the value must be zero in equilibrium, that is,

$$p(1+i)L - (1+r)L = 0,$$

Which on manipulation yields

$$i = \frac{1+r}{p} - 1$$

Notice that when $p = 1$, that is, when there is no default risk, we have $i = r$: informal interest rates are the same as formal-sector rates. However, for $p < 1$, we have $i > r$: the informal rate is higher to cover the risk of default. To get a sense of the magnitudes involved, take the formal-sector rate to be 10% per annum (not unusual figure) and suppose that there are 50-50 chance of default, that is $p = 1/2$. You can easily calculate from the equation that i turns out to be a steep 120% per annum! Clearly, even under competition, informal-sector rates are very sensitive to the default risk.

Source: D. Ray, *Development Economics*

From the simple model shown before we can see how sensitive informal-sector rates are to the default risk. In formal-sector this risk is not as high thanks to the collateral given or thanks to a well-developed legal machinery which can be used to enforce contracts. The point here is, although potential default may be important, lenders must manage to develop contracts and create incentives to overcome the problem. Understanding these mechanisms is the key for understanding informal-sector and microfinance.

Over the past decades concern about serving the rural credit market has been growing. It has been generally accepted that it cannot be adequately served with the use of large financial institutions such as commercial banks. As we underlined before, the micro-information that is required for these operations precludes efficient market coverage on the part of these large organizations. There are two types of solutions that can try to answer this observation. One could be to accept that local moneylenders are in a better position to grant and to recover loans in this sector. So the idea would be not to try to replace them, but to help them do a better job by giving them access to formal credit. And allowing them to use these funds in the informal markets. The second approach is to actually design credit organizations at the micro level that will take advantage of local information in innovative ways. These credit organizations are known as Microfinance.

1.3 What is Microfinance? A definition

We may define microfinance as providing financial services to poor people. With financial products that are appropriate for them. These financial services may include credit, insurance, leasing, savings, payment services, etc.

One of the main reasons why normal banks do not lend to poor people is because of their lack of collateralization. This means that poor

households cannot offer any collateral in order for the bank to feel safe lending money to this people. In the other hand the lack of information also affect banks, which usually have a hard time serving the poor, even household with seemingly high returns. The important factors are the bank's incomplete information about poor borrowers and the poor borrowers' lack of collateral to offer as security to banks.

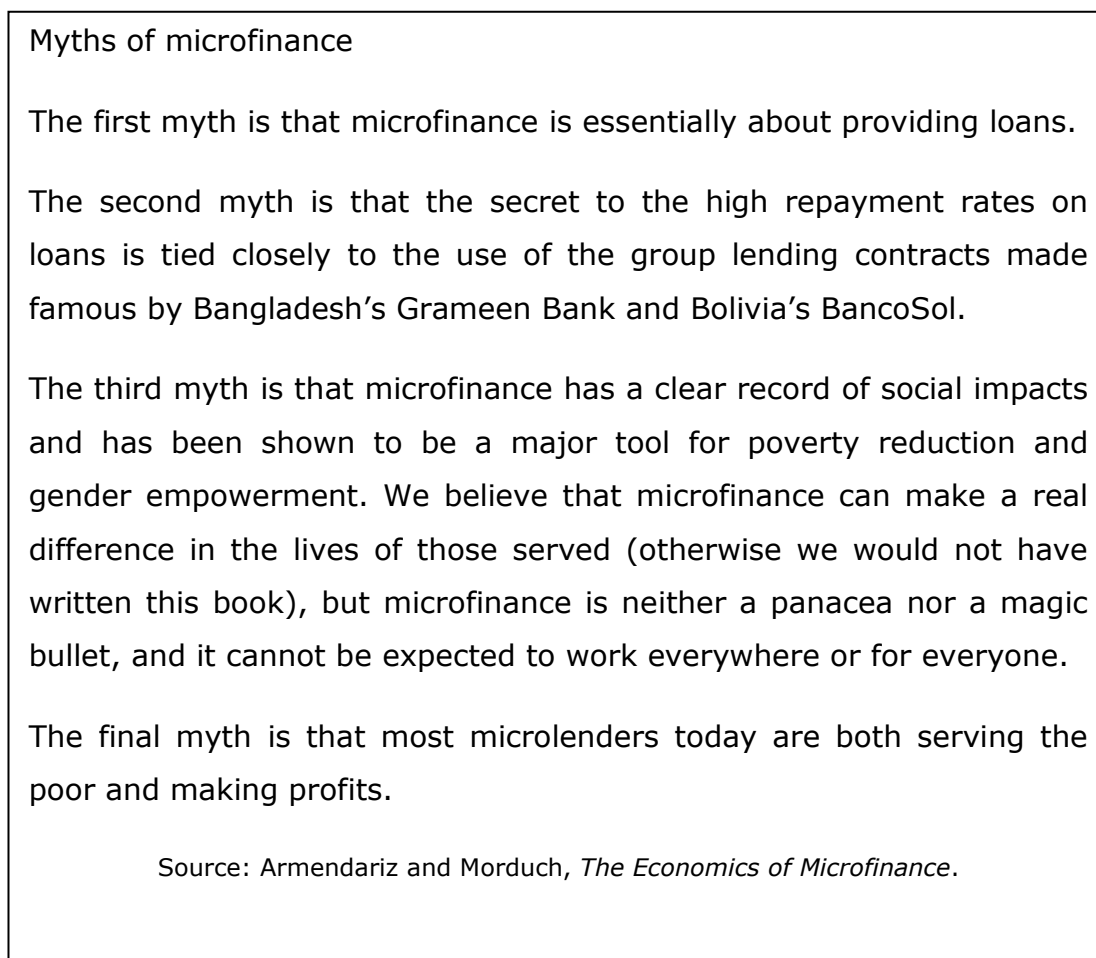
This can also be seen as the market of lemons and the asymmetric information problem from Arkerlof.⁵ A normal bank cannot have the complete information on the borrower, and the only way for the bank to break even is to rise the interest rate. By rising the interest rate the good or safe borrowers will not be able to have the loan to make theirs investments. Therefore one risky borrower (lemons) will ask for money. The bank will rise again the interest rate, and this process will continue on and on until the market disappears.

Traditional commercial banks avoid this population. First, the loans are so small that profits are typically hard to find, and, second, lending seems risky since the borrowers are too poor to offer much in the way of collateral.

The main difference between microcredit and microfinance is that, microcredit refers to small size loans given to poor people. Whereas microfinance is providing all type of financial services to poor people with the appropriate characteristics. Microfinance includes microcredit.

⁵ G.A. Akerlof, *The Market for "Lemons": Quality Uncertainty and the Market Mechanism*, 2003.

Figure 3 Myths of Microfinance.



1.4 The origins of Microfinance

The origins of microfinance can be track down to the Grameen Bank of Bangladesh. They were the first to face the information problem by building a lending institution using the information base of a community. The bank started in the mid-1980s by Prof. Mohammed Yunus, lends to very poor household, and lends to groups of borrowers rather than individual within the group. The Grameen's "classic" group lending contract works very differently from a commercial banking contract for small business. In a average relationship, the borrower offers the bank collateral as security, gets a loan from the bank, invests the capital to generate a return, and finally pays the loan back with interest. If borrowers cannot repay, their collateral is detained.

But Grameen clients are most often too poor to be able to offer collateral; instead, the classic Grameen contract takes advantage of clients' close connections within their communities. To take advantage of those relationships, the loan contract implicates groups of customers, not individuals acting on their own. The groups form voluntarily, and, while loans are made to individuals within groups, all members are expected to support the others when difficulties arise.

A typical group contract would have 5 borrowers, and lending to individuals within the group occurs in sequence. This mechanism essentially allows the poor borrowers to act as guarantors for each other. With group lending in place, the bank was able to quickly grow village by village as funding permitted. Loans have an average size of 100 dollars. No collateral is requested and the nominal rate of interest is around 20%. Women borrower will count for over 90%. The average rate of repayment is 97%.

The Grameen contract also creates "dynamic incentives" and creates information by starting with very small loans and gradually increasing loan size as customers demonstrate reliability. The bank is also different than normal banks in terms of repayment frequency. People will start repaying their loans just a week after the initial loan has been disbursed and continue weekly after that. This makes a contract that is closer to a consumer loan than a business loan, and it changes the nature of the risk that the bank is taking on and the service that the bank is providing.

1.5 Group lending and the use of information

There are two separate but complementary reasons for the success of microfinance in addressing the information problem. First, by asking borrower to form a group in which all borrowers are jointly liable for each other's loans (this is called joint-liability lending). Second, most microfinance institutions employ intensive monitoring of

clients, and rely deeply on the promise of repeat loans for borrowers who perform well.

The central feature of the Grameen Bank's lending policy is that in the event of a default, no group member is allowed to borrow again. This means that when the group is formed individuals will search and apply only if they know their partners are good borrowers and they trust each other. They have incentive to use the information they have on each other to form the group, inducing a form of self-selection between good borrowers.

This mechanism allows to have positive assortative matching, meaning that good credit risks come together and riskier projects will be driven out of the market. This is especially true in rural areas where information flows freely.⁶ This means also that the selection process and its cost will be assumed by the borrowers. They are the ones who have the information on each other.

Another way to see it is adding an extra cost to the loan paid by the borrower. This extra cost depends on the actions taken by the other borrowers in the group, and paying if they fail to fulfill their obligations. The borrower would try to minimize this extra cost by choosing partners he trusts and he knows they are less risky.⁷

It will also have an effect as peer monitoring, which means that even if the group members may not be able to control what their fellow member is doing with the money, they will be in a position to make a good prediction. They might be in a situation where they are able to monitor each other and influence to change the choice of individuals' projects, since they will want the different projects to be

⁶ Christopher Udry, "Credit Markets in Northern Nigeria: Credit as Insurance in a Rural Economy," *The World Bank Economic Review* 4, no. 3 (1990): 251–269.

⁷ Maitreesh Ghatak, "Group Lending, Local Information and Peer Selection," *Journal of Development Economics* 60, no. 1 (October 1999): 27–50, doi:10.1016/S0304-3878(99)00035-8.

safe. Pressure within the group will lead to low down the level of riskiness.

We may say that the cost of the loan is represented by the interest rate. The loan sizes are very small and there are limits on the interest rate that can be charged without affecting the repayment capacity. This means that each loan dollar comes with high administrative overhead. The costs of providing, tracking, and ensuring repayment of the loan are fixed costs per borrower, the small sizes raise these costs.

Muhammad Yunus describes this joining mechanisms as following⁸:

The Delivery System: The Mechanics of Joining

We discovered that the formation of a group was crucial to the success of our operations. Individually, a poor person feels exposed to all kinds of hazards. Group membership gives him a feeling of protection...

Subtle, and at times not so subtle, peer pressure keeps the group members in line with the broader objectives of the credit programme. A sense of inter-group and intra-group competition helps everyone try to be an achiever. It is difficult to keep track of individual borrowers; but if he or she is a member of a group, it is much less difficult. Also, shifting the task of initial supervision to the group reduces the work of the bank worker and increases the self-reliance of the group. The group dynamic is important: because the group approves the loan request of each member, in the process it feels morally responsible for the loan. So if any member of the group ever gets into trouble, the group usually comes forward to help out. We therefore required an applicant to form a group of people,

⁸ M. Yunus, *Banker to the Poor: Micro-Lending and the Battle Against World Poverty*, e-book (Aurum Press. Kindle Edition., 2012).

other than family members, who should be like-minded and should have similar economic and social status. Loans were given to the individuals. Although we put a system of interlocking responsibilities in place, formally each borrower was personally responsible for his or her loan. We also decided that a borrowing group should form itself rather than being formed by us. Group solidarity would be stronger if the group came into being through the borrowers' own negotiations.

It is not easy to form a group. What happens is that a prospective borrower has to take the initiative to form a group and to explain how the bank works to a second person (not a member of the family), and she has to convince the second to want to join. If this is the first time Grameen has entered the village, it will not be easy. Usually, the first will have to try various friends who will be terrified, or they will have excuses, or their husband will not allow them, or they are simply against the idea of being indebted to any one, 'No, I can't, this is terrible.' But eventually a friend will have heard what Grameen did for other households and will say, 'Okay, let me think about it, come back tomorrow.' Then the two will go out and each one will seek out a third member, and a fourth, and a fifth...

...Then each prospective borrower has to go through a lot of training so that they fully understand what we are about. Often the night before a borrower is accepted into Grameen she is so worried and nervous that she goes and prays to Allah to help her out; she promises to light a candle in some saint's shrine...

...Finally on the day selected, each of the five in the group are separately tested on what they have learned about Grameen. They know that if they fail, they will let down not only themselves but also the others in their group. They have to answer questions like: 'What is the group fund?' They don't have

to write anything down – most of them don't know how to read and write – but it must be clear that they understand what they are saying. If a prospective borrower fails to answer correctly, the bank worker will tell the group to study some more. Others in the group will tell her, 'For God's sake, even this you cannot do right! You have ruined not only yourself but us as well.'

This process assures us that only those who are really desperate and tough will become members of Grameen. Some critics say our rural clients are too submissive, that we can intimidate them into joining. Perhaps this is why we try to make it hard to join Grameen. We wanted our members to overcome hardship and harassment, so that only those who are genuinely poor come to us. Better-off women will not find it worthwhile to go through with it...

...Once the members had demonstrated their knowledge of how our project worked and once the group was recognized, they attended weekly meetings for about a month. Then finally the day would come when a group member would muster her strength and ask for a loan; usually the first loan is about \$ 12, or \$ 15. She cannot imagine larger amounts than that, it is the largest amount she can possibly think about...

...When she finally receives that \$ 15 loan, she is literally trembling, shaking. The money is burning her fingers. Tears roll down her eyes because she has never seen so much money in all her life. She never imagined it in her hand. She carries it as she would carry a delicate bird or a rabbit, until someone tells her to put it away in a safe place lest anyone steal it. (And theft does occur, as our borrowers discover.) She cannot believe such a treasure has been put in her hands. This generally is the beginning for a Grameen borrower. Today, for the first time in her life, an institution has trusted her with all this money. She is stunned. She promises herself she will never let down the

institution which has trusted her so much. She will struggle to make sure every penny is paid back. And she does it.

At first we extend loans to only two group members. If these two repay regularly for the next six weeks, two more members can become borrowers. The chairman of the group is the last borrower of the five. When the first-time borrower pays back her first installment, there is enormous excitement because she has proved to herself she can earn the money to pay it. Then the second installment, then the third. It is an exciting experience for her. It is the excitement of discovering the worth of her own ability, and this excitement seizes her; it is palpable and contagious to anyone who meets her or talks to her. She discovers that she is more than what everybody said she was. She has something inside of her that she never knew she had. The Grameen loan is not simply cash, it becomes a kind of ticket to self-discovery and self-exploration. The borrower begins to explore her potential, to discover the creativity she has inside her. I would say that with Grameen's two million borrowers, you get two million thrilling stories of self-discovery. We also decided to set some funds aside as a fallback to protect the borrowers in case of emergency.

We automatically put 5 per cent of each loan into a so-called group fund, into which members were also required to make weekly payments of 2 taka. If a member defaulted, no other members of that group could get a loan. In practice, when a member has difficulty repaying a loan, the other members of the group work out a solution that assures repayment to the bank. The organization of up to eight groups in a 'centre' was another way we found to develop leadership skills and to improve on self-help techniques. Centres meet in the village with a bank worker at a regularly scheduled time, usually early in the morning so as not to conflict with work commitments. At

these weekly meetings, members make repayments, they make deposits to savings accounts and discuss new loan requests and any other matters of interest. If the group has trouble with one of its defaulting members, then the centre can help to work out a solution. All business, especially the exchange of money and the discussion of loans, is carried out openly. This reduces the opportunities for corruption and increases the opportunities for members to assume responsibility. Each group elects a chair and a secretary. The centre elects a chief and a deputy chief. These serve for one year and cannot be re-elected. The self-reliance of the group, the reduction of work on the bank agent and a strong savings programme are all essential. The existence of a common group fund gives members experience in money management.

The main idea is that with group lending (also known as joint-liability lending), microfinance is able to deal with the four major problems faced by lenders. They manage to do so, by using local information and social capital that exist among borrowers.

The four main problems are:

1. Adverse selection - to find out what kind of a risk the potential borrower is,
2. Moral Hazard - to make sure she will apply the loan properly, once made, so that she will be able to repay it,
3. Auditing Costs - to know how her project really did in case she announces her inability to repay,
4. Enforcement - to find techniques to force the borrower to repay the loan if she is unwilling to do so.

MFIs can perform better than standard bankers in some social contexts for two different reasons. First, members of a community may know more about one another (that is, each other's types, actions and states, as suggested by points: 1 and 3, from above) than an outside

bank. Second, a major source of market failure in credit markets is that a bank cannot apply financial sanctions against poor people who default on a loan, since by definition they are poor. People within the group may be in a position to enact powerful non-financial sanctions at low cost. With this mechanism micro finance institutions have high repayment rates.

An institution that gives poor people the proper incentives to use information on their neighbors and to apply non-financial sanctions to delinquent borrowers can out-perform a conventional bank.⁹

From another prospective we can look at the problem in terms of transactions costs. A normal bank would prefer to have one big loan with only one client rather than having many small loans. It is more expensive to administer a group of loans than a single loan. So the group lending enables a reductions in transactions costs per loan. If the borrowers have similar projects to be funded, have more or less the same characteristics, and the geographic location, then organizing the lender's dealings with these borrowers by putting them together in a group can save on processing, screening and loan collection costs. Transaction cost-based theories and joint-liability-based theories can be combined.

Group lending can improve the performance of microfinance institutions by facing the four main problems that this institutions face when lending to poor borrowers who cannot offer collateral: adverse selection, moral hazard, costly audits and enforcement.

We will illustrate these benefits by using a simple model of lending.¹⁰

Simple setup: output Y takes two values, high Y^H . and low Y^L where $Y^H > Y^L \geq 0$. For simplicity, we normalize Y^L to zero. Output is

⁹ Maitreesh Ghatak and Timothy W. Guinnane, "The Economics of Lending with Joint Liability: Theory and Practice," *Journal of Development Economics* 60, no. 1 (1999): 195–228.

¹⁰ *Ibid.*, 199.

high with probability $p \in (0,1)$. Each project requires 1 unit of capital and the lender needs to be paid back an amount $\rho > 1$ per loan, principal plus interest, on average. Borrowers will borrow only if their payoff exceeds the opportunity cost of their labor, \bar{u} . The project returns of different borrowers are assumed to be uncorrelated. We assume that all projects are socially profitable in the sense that the expected return from the project is greater than the opportunity costs of the capital and labor employed in the project

$$pY^H > \rho + \bar{u}.$$

We assume limited liability, in the sense that the lender can only seize assets that the borrower has specifically pledged as collateral for a loan. Most Microfinance Institutions operate in environments where borrowers do not have physical or financial assets to pledge as collateral, meaning that a lender has no recourse in the case of a defaulting borrower.

In a standard loan contract specifies an interest rate r (this is a gross interest rate, namely, principal plus the net interest rate) which is the amount the borrower must repay to the bank. This can be interpreted as the individual liability of the borrower. The model express this in the following way: if a borrower is willing and able to repay her own loan but her partner is unwilling or unable to repay her loan, then the former must pay an additional amount c to the bank. The form of group lending liability for defaults in actual group-lending programs regularly takes the form of denying future credit to all group members in case of default by a group member until the loan is repaid.

We can see more deeply how the group lending mechanism faces each of the four problems mentioned before.

1.5.1 Adverse Selection

Adverse selection arises when the characteristics of the different borrowers are unobservable to the microfinance institution. Some borrower may be riskier than others, some have more probability to

repay the loan. The institution can directly deal with this problem by trying to calculate these characteristics. They can also deal indirectly by offering loan terms that it is only suitable for good borrower (those with a lower risk profile) to accept. The classic method for separating good risks from bad risks is to ask the borrower for some property as collateral. We assume poor people do not have any assets to use as collateral. Group lending deals with adverse selection by drawing on local information networks to achieve the equivalent of gathering direct information on borrowers and using differences in loan terms to discriminate good from bad borrowers. Borrowers know the characteristics of each other's projects and their creditworthiness. While all borrowers prefer to have safe partners (because of lower expected joint-liability payments) safe borrowers value safe partners more than risky borrowers because they repay more often, and as a result more likely to realize the gain of having a safe partner. This implies that in equilibrium, borrowers end up with partners of the same type. As a consequence, the bank can screen borrowers by varying the degree of joint liability. This is because risky borrowers have risky partners and, hence, will prefer a contract with less joint liability than will a safe borrower.

Simple Model

Assume borrowers are risk-neutral and of two types, safe (a) and risky (b). With a project of type i , output takes two values, Y_i^H and 0, and the probability of high output is p_i , $i = a, b$. We assume $p_b < p_a$. If the bank does not know a borrower's type, and if standard screening instruments such as collateral are not available, then the bank has to offer loans to all borrowers at the same nominal interest rate. Under such a contract, safe borrowers have to cross-subsidize the risky borrowers because both types of borrowers repay the same amount when they succeed, but safe borrowers succeed more often. The presence of enough risky borrowers can push the equilibrium interest rate high enough to drive the safe borrowers away from the

market (as in the lemons model of Akerlof¹¹). Alternatively, the presence of safe borrowers subsidizes some undeserving risky projects. If borrowers know each other's types, a joint-liability contract can restore full efficiency. Under a joint-liability credit contract, a borrower must repay her loan r whenever her project yields high returns, and in addition, if her partner's project yields low returns, she must pay an extra amount $c > 0$. The expected payoff of a borrower of type i when her partner is type j from a joint-liability contract is:

$$EU_{ij}(r, c) = p_i p_j (Y_i^H - r) + p_i (1 - p_j) (Y_i^H - r - c).$$

The net expected gain of a risky borrower from having a safe partner is $EU_{ba}(r, c) - EU_{bb}(r, c) = p_b(p_a - p_b)c$. Similarly, the net expected loss for a safe borrower of having a risky partner is $EU_{aa}(r, c) - EU_{ab}(r, c) = p_a(p_a - p_b)c$. If $c > 0$, the latter expression is larger than the former since $p_a > p_b$. Hence, a risky borrower will not find it profitable to have a safe partner. A borrower of any type prefers a safer partner, but the safer is the borrower herself, the more she values a safe partner. A risky borrower in theory could pay the safe borrower to accept her as a partner, but the expressions above imply that such payments would have to be so large that the risky borrower would not want to make them. As a result, group formation will display positive assortative matching under a joint-liability contract.

1.5.2 Moral Hazard

After the borrower has been identified and he has taken the loan, the outcome of the project will depend mainly on borrower's actions, their level of labor and other inputs. In a normal situation, borrowers would undertake these actions needed for a high payoff if the marginal benefit of each action equals its marginal cost. But in case of having asymmetric information, this is not necessarily the case. Since there is no collateral, the objectives of the borrower and the lender are

¹¹ Akerlof, *The Market for "Lemons": Quality Uncertainty and the Market Mechanism*.

different. The borrower knows that if the project goes bad he will not internalize the cost of the failure. Most of the actions that the lender would like the borrower to take are unobservable, or could be observe at a high cost.

With group lending the members within the group have an incentive to take actions against the member of the group that is not using the loan properly. Thus, group lending increases welfare and repayment rates. This idea can be shown with the following simple model¹².

Output takes two values. Borrowers are risk-neutral, as before. But the borrower's actions determine the probability of success. So output is Y^H with probability p and 0 otherwise. Borrowers choose actions, which can be thought of as a level of effort $p \in [0,1]$, for which they incur a disutility cost of $1/2\gamma p^2$ (where $\gamma > 0$). The borrower's choice is unobservable to the bank. Notice that social surplus $pY^H - 1/2\gamma p^2$ is maximized if $p = p^* = Y^H/\gamma$. Let us assume that $Y^H < \gamma$ so that we have an interior solution. With perfect information, the bank could specify that the borrower choose $p = p^*$ and charge an interest rate $r = \rho/p^*$. But if the choice of p is subject to moral hazard, then taking the interest rate r as given, the borrower chooses p to maximize her private profits:

$$\hat{p}(r) = \arg \max \left\{ p(Y^H - r) - \frac{1}{2}\gamma p^2 \right\} = \frac{Y^H - r}{\gamma}.$$

The interest rate is like a tax on success since it has to be paid only when output is high. Hence, $p^* = \hat{p}(0) > \hat{p}(r)$ and the higher the interest rate, the lower is p . Substituting $p = (Y^H - r)/\gamma$ in the bank's zero-profit condition $pr = \rho$, we get $\gamma p^2 - Y^H p + \rho = 0$. This is a quadratic equation in p which means there are two values of p consistent with equilibrium. We assume that the equilibrium with the higher value of p

¹² Ghatak and Guinnane, "The Economics of Lending with Joint Liability: Theory and Practice," 203.

is chosen (since the bank is indifferent and the borrower is strictly better off).

1.5.3 Costly state verification

After the loan has been given and the project has been undertaken, a new problem arises. Even if the outcome of the project was as expected, the borrower can simply say that he is unable to repay the loan. A formal lender will find it difficult to verify if the borrower is really unable to do so. Since we are assuming a poor borrower with no wealth given as collateral, the borrower cannot pay much if the project fails. The bank would have to accept to charge a lower interest for that loan. But if this situation spreads to other borrowers, the bank would be in a position where they cannot break even. The high cost that must be sustained to verify the contract are an incentive for the borrower to report less output from her project. To solve these two problems of false reporting and costs of verification the optimal contract will have the following terms: as long as the borrower is willing to pay a fixed fee, the bank does not audit, but if she reports that she is unable to pay this fee, the bank audits her and takes away all her returns. This is a normal debt contract. With this type of contract, if the borrower reports that her output was low, the bank will pay the cost of verification and will take all her output. But if the cost for verification are too high, a contract that allows the bank to break even may not exist.

We can see how group lending reduce the verification cost with the following model.¹³

The main idea behind is that borrowers face lower costs for the verification of each other's output than the bank. This is because they know each other, the places they live and work. The bank will then avoid paying the cost of verifying every time a borrower reports she had a low output by inducing their partners to undertake liability for

¹³ Ibid., 206.

her. Only when the whole group announces its inability to repay will the bank have to pay for the verification costs.

We assume that all projects are alike and the only departure from the first-best is costly output verification: the outside lender has to pay $\gamma > 0$ to verify the return of each individual project. There are no problems of moral hazard, adverse selection or enforcement of contracts. The financial contract specifies three numbers: the transfer from the borrower to the bank when the project succeeds (r), and the probabilities of an audit (λ_H and λ_L), when output is high and low. As before, everyone is risk-neutral and there is a limited-liability constraint. Formally, the optimal contract then solves:

$$\max p(Y^H - r) - \bar{u}$$

subject to the following two constraints:

$$Y^H - r \geq \max\{0, (1 - \lambda_L)Y^H\}$$

$$\rho \leq p(r - \lambda_H\gamma) + (1 - p)(-\lambda_L\gamma).$$

The first constraint is a “truth-telling” constraint which says that given the contract, the borrower will have an incentive to repay the loan when output is high rather than announce that output is low and risk an audit (with probability λ_L) in which she could lose all the output to the bank. The second constraint says the bank should break even on the loan under the contract.

Since there are no risk-sharing issues, the optimal contract has a very simple structure: it minimizes auditing costs by auditing with positive probability $\lambda > 0$ when the borrower claims output is low and the bank takes all output. Otherwise, the borrower pays an interest r in which case, there are no audits. From the two constraints, we get:

$$r = \lambda Y^H$$

$$\lambda = \frac{\rho}{pY^H - (1 - p)\gamma}$$

Notice that to ensure $\lambda \leq 1$, we need:

$$pY^H - (1 - p)\gamma \geq \rho.$$

This condition means that the expected return from the project less the expected costs of auditing has to be at least as large as the opportunity cost of capital. This condition also ensures that $pY^H - (1 - p)\gamma > 0$ and, hence, $\lambda \geq 0$. Finally, substituting in the borrower's payoff, we see that an optimal contract exists if

$$p(Y^H - r) - \bar{u} \geq 0.$$

That is, the borrower's expected return net of interest payments has to be as large as the opportunity cost of her labor.

1.5.4 Enforcement

The last problem that arises not from the information problems that we talk before, but from the capacity of the lender to enforce the contract and, if it is the case, to apply sanctions against a delinquent borrower. We may have a situation in which, even if the borrower's project had succeeded she may still not pay if the legal system does not work well, and if the poverty of the borrower limits the amount of effective sanctions. The group lending contract has two opposing effects on repayment rates. An advantage of the group is that it allows members whose outputs were high to pay off the loan of a member whose project fail. At the same time it has the disadvantage that relative good members may default on their own repayment because of the burden of having to pay for the loan of those whose project fail. If the social ties within the group are strong enough, the total effect is positive, since by defaulting intentionally the borrower may face not only sanctions from the bank but from the community as well. With appropriate social capital, a group contract enforces repayment better than with individual contracts.

We can also illustrate this by using the following model.¹⁴

We now assume borrowers are risk-averse. Suppose the only departure from the first-best stems the fact that borrowers can default intentionally even when they are capable of repaying. The punishment a bank can impose on a delinquent borrowers is limited and consists entirely of never lending to her again. If a borrower's project yields output $Y > r$ so that she is able to repay, she will repay only if the benefit of defaulting, the interest cost, is less than the (discounted) net benefit of continued access to credit, \bar{B} :

$$u(Y) - u(Y - r) \leq \bar{B}.$$

The term \bar{B} reflects the present value of the net benefit to the borrower from having continued access to loans from the bank. In the current context, if the borrower defaults once, the bank never lends to the borrower again, and the borrower never repays if she receives a loan again. We are also assuming that the bank does not pre-commit to future interest rates and hence the benefit from future access to loans viewed from the current period is independent of the interest rate r . Even if \bar{B} depends on r (it is expected to be decreasing in r) the above argument goes through: for a given r there will be some critical $Y(r)$. such that borrowers will repay if $Y \geq Y(r)$.

Let $Y(r)$ be the income level that satisfies this condition with strict equality. If there is diminishing marginal utility of income, then for a given r , the borrower will repay only if $Y \geq Y(r)$. If the returns are not very high, repayment is costly because the marginal utility of income is high. Under a joint-liability contract, all group members are considered to be in default unless every loan is repaid and in the event of a default no one gets a loan in the future. A borrower will choose to repay even if her partner defaults (given that she is able to repay, i.e., $Y \geq 2r$) if:

¹⁴ Ibid., 209.

$$u(Y) - u(Y - 2r) \leq \bar{B}.$$

If $Y > Y(2r)$, she will default on both her own and partner's liability. Note further that $Y(2r) > Y(r)$; since paying off both her own and her partner's debts is more onerous than paying off just her own loan, only when income is very high would borrowers want to repay under this contract. Assume for simplicity $Y(r) > 2r$ and that if both members have an income $Y > Y(r)$, then they repay under joint liability. There are two distinct cases.

- One group member is unable or unwilling to repay and the other member is willing to repay both her own and her partner's obligation. In this case, joint liability is beneficial compared to individual-liability lending.
- One member is unable or unwilling to repay her own debt and her partner is willing to repay her own debt but not both of their debts. Now individual liability is better than joint liability.

Depending on which of these cases is more likely to occur (which depends on the probability distribution of output), default may be more or less common with joint liability. However, social sanctions alter the effect of joint liability. Suppose a default by one borrower that hurts the other group member (because she is cut off from loans in the future) elicits some punishment from the community ('social sanctions'). These social sanctions alter the repayment condition under joint liability. Social sanctions reduce the attractiveness of the payoff stream in the case when one party defaults intentionally ($r < Y < Y(r)$) and the other party was willing to repay her own loan but not her partner's ($Y(r) < Y < Y(2r)$). In this case, repayment would definitely be higher under joint-liability contracts. If repayment decisions are taken cooperatively, repayment behavior under joint liability is identical to repayment behavior with individual liability.

1.6 Innovations on group lending

There are also some innovations that continue to change group lending. These innovations have helped MFIs to spread into larger areas. We would like to explain briefly some of them. We will focus on four: the use of “progressive lending”, the flexible treatment of collateral, the focus on women as customers, and the promotion of clients’ savings.¹⁵

Progressive lending

The idea is simple: each borrower is granted a small loan in the first period, which is normally repayable over one year in weekly repayments. Then, year after year the loan dimension grows as the borrower reveals her reliability and trustworthiness. This mechanism enables microlenders to “test” borrowers with small loans at the start in order to screen out the worst prospects before taking additional risks by increasing loan scale. Also, it increases the opportunity cost of non-repayment in that borrowers become increasingly fearful about being denied access to credit in the future since nonpayment will trigger cut-off from an increasing stream of future loans. There are two motives why microlenders cannot entirely depend on progressive lending, however. One is that when there are many microlenders, threats to not refinance borrowers lose their power because borrowers who default on a loan can always go to another microlender. The other tension is that as the loan dimension grows, defaults become more and more attractive, especially if the relationship between the microlender and the borrower has a clear last period.

Flexible collateral

One more innovation resides in flexibility with regard to collateral. For banks that need collateral, they can reach a wider group

¹⁵ Beatriz Armendáriz De Aghion and Jonathan Morduch, *Microfinance: Where Do We Stand* (London: Palgrave Macmillan, 2004).

of borrowers by reducing concern with the salvage value of collateral and instead just looking at the “notional” value. A good example of this can be the kind of collateral which is being accepted by microlenders in rural Albania, which consist of livestock, land, and working tools. One main difficulty with this innovation, however, is that it still needs some kind of collateral and thus can undercut microlenders’ efforts to reach very poor borrowers. But it has proven effective when lending to households just below and just above the poverty line.

Focusing on female customers

According to recent reports, women make up to 80 per cent of the clients of the world’s 34 largest microlenders. Many MFI from their first steps, focused on supporting nonfarm enterprises. This opened up the door for serving women in greater numbers, since women often take the lead in processing and small enterprise like craft-making. There are two main reasons for targeting women: one is financial and the other is social. From the financial standpoint, relative to men, women are more conservative in their investment strategies. Banks, though, are most interested in unconditional expectations when targeting, and, for that, simply knowing that women on average are better clients has been a powerful force toward re-orienting programs toward women. The other reason for targeting women is that lending to women can be more effective in meeting social objectives. A growing literature in sociology and economics documents both the overrepresentation of women amongst the poorest of the poor and the greater probability that money in the hands of women is spent on children’s health and education relative to money in the hands of their husbands.

Savings

Another innovation concerns savings. Having a safe, convenient, secure place to save allows poor households to better manage their money, handle large expenses like school fees and religious

obligations, and start building up assets that might eventually be used as collateral. Some microlenders are offering “voluntary” savings. The latter could not be withdrawn without the consent of the group and, in practice, came to act as a form of collateral that could be accessed in times of repayment problems. Therefore, introducing savings facilities in tandem with lending further enhanced the lenders’ financial self-sustainability objectives. The push today is to shift from an emphasis on the obligatory deposits and to move toward emphasis on voluntary deposits. One tension is that transactions costs are high since deposits and, with “voluntary” savings accounts, withdrawals are not made in fixed amounts that can be quickly recorded; amounts transacted may also be tiny. Banks also need greater liquidity in order to have funds available for unexpected withdrawals, and this cuts into investment income. Most importantly, institutions that take savings need greater regulation than institutions that only make loans.

2 Risks in Microfinance

This chapter has the objective to explain which are the main risk faced by a MFIs and the way they deal with them. We will make an especial focus on the central differences in risk management between classic commercial banks and MFIs.

Risk is at the heart of any finance institution. It is part of the financial intermediations. This makes that Risk Management must be at the center in any financial institution. Since the MFIs had been growing in the last decade, the importance of risk management has been gaining more and more importance for a good management.

It is important to mention that a great portion of the borrowers from MFIs are involve in agricultural activities. Financing this type of activities is riskier than financing trade or industry, because of the inherent risk in agriculture.

Many of the former MFIs are now providing other products. Most of them started as NGOs lending small loans for a small period of time. Now, many of them had grown in size, transforming to fully or partially regulated financial entities, and are providing larger loans for a longer time. Loans that are not just only for the working capital needs but also for acquiring fixed assets. Some MFIs are now also offering other services such as deposits, micro-insurance, or payment services.

MFIs are also shifting away from their reliance on donor financing and relying more in commercial funding sources such as client deposits and loans from commercial banks and private investors. With such funding come more rigorous repayment schedules and higher cost-of-funds, exposing an MFI to additional risks such as liquidity risk, interest rate risk and often exchange rate risk.

Although MFIs and the industry have suffered serious setbacks in some countries, the industry has been relatively stable in most countries. A number of institutions, such as Compartamos in Mexico (of whom we will talk in chapter 3), have managed to sustain their

growth rates remarkably well without sacrificing portfolio quality. However, it must be recognized that the changes in markets, products and services, delivery models, and technology used in the industry have had, and continue to have, profound implications on the overall risk profile of the industry over time. MFIs can no longer afford to focus only on credit and liquidity risks and consider other types of risk on an ad hoc basis, often in a reactive manner. Risks in microfinance must be managed systematically and the importance of risk management will further increase as the industry matures further and microfinance markets become more competitive.¹⁶

In microfinance, risk is defined broadly as “the potential for events or ongoing trends to cause future losses or declines in future income of an MFI or deviate from the original social mission of an MFI.” We have included the deviation of the social mission in our definition because such deviation can occur without necessarily causing losses or declines in future income and, in our view, the risk of mission drift is one of the most significant risks in microfinance. This is not considered part of the risk profile of conventional financial institutions because they do not have a social mission.¹⁷

2.1 Categories of Risks in Microfinance

Many MFIs in their early stages have focus mostly in the financial risks. And within this category, they have focused in the credit risk. They have started to concentrate on liquidity risk when the demand for loans began to rise, and they would run out of cash to meet this demand.

There had been many efforts to make a categorization of the different risk that a MFI must deal with. In a publication from Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), they considered

¹⁶ Jennifer Powers, *Shifting Technical Assistance Needs for Commercial MFIs: A Focus on Risk Management Tools* (New York: Banyan Global, 2005).

¹⁷ Nimal A. Fernando, *Managing Microfinance Risks: Some Observations and Suggestions* (Metro Manila: Asian development bank, 2008), 9.

three major risk categories: financial, operational, and strategic. Inside each of these categories, they also mention some subcategories.¹⁸ In other authors such as Churchill and Frankiewicz divide risks into four categories: institutional, operational, financial, and external. They also list a number of subcategories inside each one of them.¹⁹

In addition, risks are either internal or external to the institution. Internal risks are largely within the MFI's control— related to operational systems and management decisions. External risks are largely outside the MFI's control.

Table 3 Risk Categories according to GTZ

Financial Risks	Operational Risks	Strategic Risks
<ul style="list-style-type: none"> •1. Credit Risk <ul style="list-style-type: none"> •Transaction Risk •Portfolio Risk •2. Liquidity Risk •3. Market Risk <ul style="list-style-type: none"> •Interest Rate Risk •Foreign Exchange Risk •Investment Portfolio Risk 	<ul style="list-style-type: none"> •1. Operational Transaction Risk <ul style="list-style-type: none"> • Human Resources Risk •Information and Technology Risk •2. Fraud Risk •3. Regulatory and Legal Compliance Risk 	<ul style="list-style-type: none"> •1. Governance Risk

Source: Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), *A Risk Management Framework for Microfinance Institutions*

¹⁸ Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), *A Risk Management Framework for Microfinance Institutions* (Frankfurt: GTZ, 2000).

¹⁹ C.F. Churchill and C. Frankiewicz, *Making Microfinance Work: Managing for Improved Performance* (International Labour Office, [International Training Centre], 2006).

Table 4 Risk Categories according to Churchill and Frankiewicz

Institutional Risks	Financial Management Risks	External Risks	Operational Risks
<ul style="list-style-type: none"> •Social Mission •Commercial Mission •Dependency •Strategic •Reputation 	<ul style="list-style-type: none"> •Asset and Liability •Inefficiency •System Integrity 	<ul style="list-style-type: none"> •Regulatory •Competition •Demographic •Macroeconomic •Environmental •Political 	<ul style="list-style-type: none"> •Credit •Fraud •Security •Personnel

Source: C.F. Churchill and C. Frankiewicz, *Making Micorfinance Work: Managing for Improved Performance*

In the next paragraph we would like to give a brief definitions on each on the risks with a especial focus on how this risk affect a MFI (we will follow the GTZ classification).

1. Financial Risks.

For a MFIs their most valuable asset is their loan portfolio, this is why financial risks (credit and liquidity) are of great concern. Financial risks begin with the possibility that a borrower may not pay the loan on time with interest (credit risk). They include the possibility that the institution might lose a significant part of the value of its loan portfolio as a result of an economic downturn, hyperinflation, and other externally generated causes (market risk). Financial risk can also include changes in interest rates or the possible enforcement of old usury laws. Market risks include lower prices for borrowers' products and services, which could directly affect their ability or willingness to repay an outstanding loan.

1.1. Credit Risk, is the risk to earnings or capital due to borrowers' late and nonpayment of loan obligations. Credit risk includes both transaction risk and portfolio risk. The credit risk has acquired different dimensions over time. Initially it was just

the possibility of default by borrowers, but now a days it may also include the risk of default of other credit institutions which have payment obligations to the MFIs. Credit risks are more acute today than in the early stages for those MFIs which have accumulated a significant amount of reserves, part of which in turn is kept in other financial institutions in the form of deposits or investments. Another type of credit risk may arise outside the MFI when borrowers from the MFIs deposit their savings in other financial institution which are not covered by a deposit protection structure. If this financial institution goes into difficulties, the borrower may not be able to access their deposits in order to repay the MFIs.

1.1.1. Transaction Risk, refers to the risk in individual loans. It refers to the risk associated to the time gap between entering into a contract and settling it. The longer the time gap the higher the risk. In microfinance this can have a great impact because the cost for operation are very high.

1.1.2. Portfolio Risk, refers to the risk inherent in the composition of the overall loan portfolio, given by the particular combination of projects, assets, units. The risk arise when this combination fails to meet the financial objectives expected.

1.2. Liquidity Risk is the risk that an MFI cannot meet its obligations on time. The importance of this risk has been growing over time. MFIs are moving away from offering standard short term products to a more flexible term structure of the loans. They are now offering new products with longer maturities increasing the overall average. Since the demand for loans continues to grow at high rates, short-term obligations seem to have increased in rank in the liability structure. In consequence, some MFIs are funding medium- to long-term loans with short-term liabilities. To prepare for these risks, MFIs usually hold in reserve between 15 and 20 percent of assets in

cash and in short-term assets. Compared to the holdings of other financial institutions (which maintain liquidity of between 5 percent and 10 percent), this reserve is high, but it allows for a great degree of short-term flexibility.

1.3. Market Risk includes interest rate risk, foreign currency risk, and investment portfolio risk.

1.3.1. Interest Rate Risk, is the risk of financial loss from changes in market interest rates. This risk has gained more importance in recent years, since many MFIs are now shifting from borrow from commercial or semi commercial banks at fixed interest rates to variable rates. At the initial states, MFIs used to fund their activities by borrowing from funds, such borrowings consisted almost entirely of fixed interest rate loans. Now that they have moved to variable rates and in the meantime their loans given to borrowers stay at fixed rates. Given that variable rates are likely to rise, and considering that it is difficult to adjust the rate in the given loans, the variable interest rate on debt capital normally expose the MFIs to a potential interest rate risk.

1.3.2. Foreign Exchange Risk, is the potential for loss of earnings or capital resulting from fluctuations in currency values. MFIs most often experience this risk when they borrow or mobilize savings in foreign currency and lend in local currency. A decade ago very few MFIs borrowed in foreign currency, many of them rely on large, long term grants issued in local currency. Now some international agencies continue to give grants but in a hard currency to protect them self from the risk. Many MFI may also have accumulated some reserves in foreign currency. These foreign currency loans and deposits create foreign exchange risks for those MFIs whose principal assets are microcredits in local currency. Devaluation of the local currency in relation to the foreign currency may generate substantial

losses to an MFI. The foreign currency risk can also generate from convertibility and transfer risk. It could be the case that even if the MFI has the financial capacity to make their payments they may not be able to do so because of government restrictions or prohibitions.

1.1.1. Investment Portfolio Risk, refers to longer-term investment decisions rather than short-term liquidity or cash management decisions. The risk arise when the invested assets may not achieve their objectives.

2. Operational Risks

Because of a number of factors the MFIs are now a days expose to greater operational risk than before. Many of them have now become regulated financial entities and therefore, subject to regulatory and compliance risk. At the same time most MFIs have expended their activities moving away from their well-known areas to other areas where they might not know as well or that are more exposed to calamities, security problems, and other such risks. Operational risks are within the MFI's control. They include the risk of loss through faulty internal processes, poorly trained personnel, and inadequate information systems. Operational manuals, clear terms of reference for key positions, loan officer rotation, checks and balances systems (such as separation of certain responsibilities), and internal and external audits all contribute to sound operational systems, and they help to manage those risks.

2.1. Operational Transaction Risk

This type of risks generally increase with the distance from the central office, and since many branches are located in rural, and not very well communicated areas the MFIs face difficulties in controlling.

2.1.1. Human Resources Risk

As a consequence of the increasing distance from the central office we would expect employees in distant areas to

remain in the same positions for a long time, situation that can generate some complications, a human resources risk.

2.1.2. Information and Technology Risk, is the potential that inadequate technology and information systems will result in unexpected losses. MFIs have try to litigate the operational risk by increasing their reliance on new information and communications technologies. This may as well add another risk when this system malfunctions or breakdown.

2.2. Fraud Risk, is the risk of loss of earnings or capital as a result of intentional deception by an employee or client.

2.3. Regulatory and Legal Compliance Risk, is the risk of loss resulting from noncompliance with the country's regulations and laws.

3. Strategic Risks

Strategic risks are those that arise from the fundamental decisions that directors take concerning an organization's objectives. Essentially, strategic risks are the risks of failing to achieve these business objectives. We may also identify inside this risk as having an inadequate structure or body to make effective decisions (Governance Risk). Strategic risks include long-term choices and changes in the business environment. Strategic risks can include inappropriate business strategies, introduction of riskier products, branch location decisions, choice of strategic alliances, and changes in market structure (caused by new entrants, new laws, and new regulations).

Many authors subdivide this risks in:

3.1. Business risks – risks that derive from the decisions that the board takes about the products or services that the organization supplies.

3.2. Non-business risks – risks that do not derive from the products or services supplied.

2.1.1 Other risks faced in Microfinance

Other type of risk now a days for MFIs is the Mission drift risk. It is important to remark that many of the transitions in economic activities are based in trust and reputations. This is even more important when talking about working with the poor. In rural areas people know each other and word spreading can be very fast. Because of this MFIs must be very careful, on presenting a good image and maintaining their focus on their mission.

Another two risks that have arisen in last years are competition risks and political risk. The competition risks have increased because of the increasing number of competitors in the market. Even if some early entrants have consolidated their position in the market and continue as market leaders, they have lost their near-monopoly position to new players.

Political risks are also greater than before. Many populist countries pressure MFIs by imposing or attempting to impose interest rate caps on micro loans. This would affect the sustainability of the MFIs which had high interest rates to achieve financial sustainability.

A risk can also come from the agricultural activities. Many MFIs have in their portfolios numerous loans given to agriculture. Agriculture is consider to be inherently riskier than industry or trade, since it is more expose to be affected by different factors such as weather, pests, diseases, and other natural calamities. Returns on agricultural activities are more volatile. This risk is higher if the activities are concentrated in one specific geographic location. The agricultural activities also require a longer term given by the cropping cycle.

There are also some specific risk that comes from operating in rural areas which most MFI operate. This are risks related to the natural resource base, the environment, and the cycles and risks of agricultural production. Many experts encourage urban MFIs to expand into the countryside and meet the challenges of the credit-hungry rural

zones. It is also well known that solidarity in rural areas is higher and therefore group lending should work better.

Some of this rural risks are:

- Market risks specific to rural lending include changes in interest rates, exchange rates, prices for inputs and outputs, and interactions between main actors in value chains. To deal with the exposure of these risks, the microbusiness operator and the MFI must put their attention on those factors that they can control.
- Production risks. From seed selection and warehousing to transport and final sales, microbusinesses confront a variety of production risks. To ensure reasonable risks, the MFI needs to develop a profile of the typical producer and the agricultural region.
- Producer risks. Rural microbusinesses are generally informal and represent an important source of risk for the MFIs. Rural clients are often isolated, increasing the costs of reaching them and enforcing loan contracts. Rural producers often have a survival mentality, rather than the profit maximization goal of a business. Many MFIs tend to make the loans to women because they have a more long term planning than men.

2.2 Risk Management process in Microfinance

Risk management is the process of controlling the likelihood and potential severity of an adverse event: it is about systematically identifying, measuring, limiting, and monitoring risks faced by an institution.²⁰

Risk management strategies try to address risk before it's too late. An MFI may adopt certain elements of risk management although

²⁰ Fernando, *Managing Microfinance Risks: Some Observations and Suggestions*, 23.

it may not have a comprehensive risk management system. Comprehensive risk management consist of practices designed to limit risk associated with individual product lines and systematic, quantitative methods to identify, monitor, and control aggregate risks across a financial institution's activities and products. A comprehensive approach to risk management reduces the risk of loss, builds credibility in the marketplace, and generates new opportunities for growth. Because effective risk management guarantees institutional sustainability and facilitates growth, it has significant implications for MFIs with a social mission to serve as many as possible poor households. Risk management is at the heart of the microfinance industry as it is in the larger banking industry. If an MFI is willing to continue to operate, it must take risk management seriously and put in place systematic measures for the purpose.

Many MFIs are some steps behind in risk management in relation to the scale, scope, nature, and complexity of their activities and the market environment in which they work. Most MFIs do not yet have comprehensive risk management systems. The average in the industry appears to be focus on efforts to manage certain types of risk but not the overall risk of the whole institution. They do not seem to be fully aware of the critical role of risk management for the effective implementation of their growth plans in an increasingly competitive market environment.²¹

Even when there are inadequacies in the way many MFIs deal with risk, an increasing number of them are making an effort to improve the way to manage their risks. Over the last years an increasing number of MFIs seem to have put in place some strategies, such as: comprehensive credit manuals, follow more aggressive loan loss provisioning policies, and carry out frequent detailed analysis on

²¹ Ibid., 26.

their loan portfolios. Many MFIs have also recognize that the internal audit department plays an important role in risk management.

2.2.1 Some general principles for Risk Management in Microfinance

MFIs are making efforts to put in place comprehensive risk management systems appropriate to their institutions. Even if each MFI operates in different areas and different circumstances, we would like to outline a number of general principles, that should be taken into account for the developing of Risk Management systems and procedures.

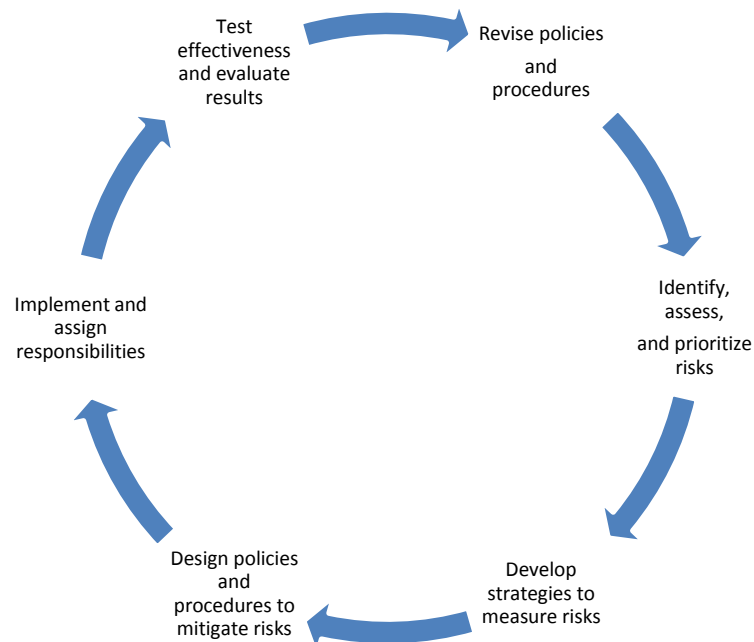
- Risk Management, should be a central point in the institutional culture. It is an activity that should engage everyone in the everyone in the organization. A good top-bottom communication is vital.
- It is important that each institution develop their own risk management system and procedures according to their own needs, and appropriate to its own risk profile, organizational type, legal context, supervisory requirements, scope, scale, and, complexity of the products and services, service delivery modalities used by the institution, and the liability structure, among others. The one-size-fits-all approach is inappropriate for microfinance risk management.
- The directors and the board of directors should be aware not to fall in an executive over optimism in their institutions. Such over optimism could turn in the underestimation of potential risk, particularly of new initiatives and growth strategies.
- Most of the risks are interrelated this is why it is needed an all-inclusive approach that will cover all types of risk to which the institution is exposed, or likely to be exposed. This system must have a looking forward prospective, to sustain institutional growth and social mission objectives for the short and medium term.

- Some elements of risk management in microfinance must go further than one's own institutional frontiers and must include procedures that would help the MFI clients to manage their risks more effectively. This is one of the fundamental differences between risk management in conventional financial institutions and MFIs. Financial understanding programs and elementary health education for the clients may be examples of the measures that a MFI can carry out to help clients. Three aspects justify such measures: (i) poor households suffer from multiple disadvantages which prevent them from fully utilizing their access to financial services, (ii) most MFIs run greater risk if their client households' economic activities do not perform as expected since they provide loans without collateral, and (iii) MFIs have a social mission.
- It is important to know that risk management is not the management of financial ratios created from balance sheets and income statements. While such ratios play an important role in an effective risk management system, a comprehensive system looks deeper.
- The board of directors and the chief executive officer of an MFI have the primary responsibility for putting in place an effective risk management system; they, in addition to others, must also share implementation responsibilities. The straight link between governance and risk management must also be known.
- MFIs need to consider risk management as a continuing process to which constant attention is required as an integral part of their daily operations.
- Risk management practices should be market oriented.
- Risk management should not be seen as something that must be put in place merely to meet the regulatory and supervisory requirements of financial authorities. Risk management needs to be seen more as a critically important way to ensure financial safety, operational efficiency, growth, and stability of the

institution to achieve its mission. Therefore, those MFIs that are not subject to prudential regulation must also have an proper risk management system.

- Feedback is important for a comprehensive risk management system. It must be done from the highest to the lowest levels of the MFI.

Figure 4 Risk management feedback loop



Source: Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), *A Risk Management Framework for Microfinance Institutions*

From all the different risks faced by MFIs, there are some which are more important to be manage. In the last decade some authors have identify some of this main risks and develop simple ways to

handle them. We would like to report as an example the work done by Till Bruett in the Microfinance Experience Series.²²

To identify and quantify them is the first step in risk reduction. Most of the MFI managers are good at dealing with credit risk and, certainly, portfolio-at-risk measurements have gained wide acceptance. But MFIs face a number of even greater risks that are not always well managed. We will now highlight some risks that are not so common but are important to be manage. We will also suggest some tactics for managing them.

1. Risk in banking relationships.

All MFIs use other financial institutions for services, they usually maintain accounts in commercial banks and use them for money transfers, foreign exchange and other services. All this banking relationships involve a type of credit risk; which is generally defined as the risk that a person or institution who indebted to another is unable or unwilling to pay. When a MFI's fails, their accounts may be frozen for weeks, months, or in rare cases, forever. This not only prevents the MFI from paying salaries and expenses, it also may interrupt loan disbursements, thereby undermining the primary incentive for clients to pay back their loans.

Some basic policies a MFI should consider:

- Select banks not only for service and price, but also for safety;
- Review your banks annually and after significant shocks;
- Deposit funds in more than one institution to diversify risk;
- Make sure your banks have deposit insurance, if available, and that it is sufficient to cover the MFIs accounts;

²² Till Bruett, "Four Risks That Must Be Managed by Microfinance Institutions," *Microfinance Experience* (2004).

- Advise MFI clients on the soundness of banks that they use for their accounts, particularly obligatory savings accounts.

2. Balance between Assets and Liabilities.

Asset/liability management (ALM) is at the core of banking. Managing the supply of funds and the demand for funds requires managing both the term and price of assets and liabilities. Managers should be aware of any significant mismatches or gaps in the maturity dates of assets with liabilities. While banks usually try to fund loans with deposits or borrowings of approximately equal maturities, MFIs are more likely to see a higher proportion of short-maturity assets—the loan portfolio—funded by medium to longer term liabilities. Funding medium or longer-term loans with short-term liabilities should be avoided.

A part of ALM is interest rate risk management. Commercial Banks' liabilities and assets are usually priced using variable rather than fixed rates. Banks often arrange crowds of analysts to improve interest rate management using complicated formulas and agreements known as derivatives. As MFIs grow and borrow, they will face the challenge of managing variable rates. Although large MFIs might consider using derivatives, most take a simpler approach. The risk for a MFI occurs when it borrows at a rate that might float up while the MFI's loans are at a fixed rate; or when the borrowings rates remains fixed while the MFI's loan portfolio yield is falling. MFI management must understand this risk and make sure loan and borrowing agreements allow for adjusting rates or setting interest rate caps or floors.

Some policies to consider:

- Set up an Asset Liability Management Committee consisting of both management and board members;

- Monitor the maturity gap on a regular basis by aging categories;
- Set targets and/or limits for the maturity gap ratio, particularly aging categories less than one year;
- Avoid funding long-term loans with short-term liabilities, such as deposits;
- Model the effect of interest rate changes using a simple model;
- Allow for interest rate adjustments in loan agreements with clients;
- Negotiate caps, steps, or predictable adjustments in interest rates in borrowing agreements with banks or deposit agreements with clients.

3. Foreign Currency Exposure

MFIs have proven stronger than larger banks after currency shocks not only because they have more diversified loan portfolios, but also because they have a tendency to have less foreign currency exposure. This may change as more donors switch from grants to loans and international investors and lenders take awareness in MFIs. Banks have established agreements known as foreign currency forward contracts which guarantee a certain exchange rate at a certain time in the future. MFIs can and do take advantage of these agreements, but forward contracts are not readily available in many currencies. MFIs frequently have to create their own hedge instrument to minimize disparities. MFI managers must understand and quantify foreign currency risk and take some actions to minimize it. Unfortunately, foreign currency exposure is not always evident—it might be hidden in donor agreements, trust relationships, or clauses in borrowing contracts.

Some policies to consider are:

- Monitor foreign currency exposure regularly;

- Review borrower and donor agreements carefully and negotiate limitations to the MFI's liability for foreign currency fluctuations, if any;
- Maintain a set percentage of equity in cash and investments in a strong international currency;
- Use some or all of the hard currency borrowings as collateral for a local currency line of credit;
- Allow for revaluations of loan principle in loan agreements with clients.

4. Cash Management

The number one reason why companies fail and banks close is a lack in liquidity. *Liquidity risk* refers to the risk that the MFI is incapable to meet its obligations due to lack of cash. Lack of liquidity can be produced by either an external market force, such as the inability to raise deposits or borrow funds, or an internal failure, such as poor forecasting and management of cash. In a commercial bank has an entire department, called a treasury department, whose primary purpose is to manage liquidity, whereas most MFIs lack even the most basic policies for liquidity management.

Measuring liquidity is difficult because most financial ratios capture a moment in time in the past rather than a movement of cash in the future. The most elementary ratio is the cash position indicator, which must be measured daily or weekly to be useful. A more effective way is to use a dynamic indicator that forecasts the sources and uses of cash for the period. If management can construct a cash budget, then they can forecast liquidity. The same way insufficient liquidity has risks, excess liquidity has a cost. The MFI should also consider what investment instruments are available for excess cash.

Some worthwhile policies include:

- Do a monthly cash flow statement;

- Pick a select group of liquidity indicators and monitor them frequently;
- Set a simple liquidity target and monitor it;
- Develop a forecast model to project future cash needs;
- Set a policy for investing excess liquidity in safe and appropriate instruments.

Sample Liquidity Target

- 1 Month Cash Expenses + X% Gross Loan Portfolio

Cash Position Indicator

- $$\frac{\text{Cash} + \text{Short-term Investments}}{\text{Assets}}$$

Dynamic Liquidity Ratio

- $$\frac{\text{Cash} + \text{Expected Cash Inflows}}{\text{Anticipated Cash Outflows}}$$

Some other author see risk as the information problem we mention before. A normal bank is not able to lend money to the poor people because they are unable to have a complete information on the borrower and they are not sure if he would be able to pay back the loan. The borrower does not have any collateral in order to overcome this problem. Goldberg and Palladini from the World Bank, have identify what they call the biggest risks that have to be manage by a MFI.²³

²³ Mike Goldberg and Eric Palladini, *Managing Risk and Creating Value with Microfinance* (Washington D.C.: World Bank, 2010), 5.

The biggest risks include (1) client selection, (2) product risk, (3) portfolio composition, and (4) loan processing and information management.

Client selection risk

Adverse client selection arises when the MFI decides to loan funds to a risky client even in a situation of incomplete information. Adverse selection can lead to a deterioration in the quality of the portfolio because the high-risk clients cannot or will not repay the loans. Adverse selection can also lead to moral hazard, which is the possibility that clients who know that they are fully protected from risk will act less responsibly and more speculatively than if they were fully exposed to the consequences of risk taking. When the MFI enforces loan repayment, it demonstrates to potential clients that the loan contract is a serious commitment of future resources and that there are specific consequences for failure to repay a loan. To ensure portfolio quality, the internal control or risk assessment unit should define risks, establish credit limits and selection criteria, and learn to recognize early signs of trouble.

Product risk

The MFI management team projects credit, savings, and other financial products. Every design choice, no matter how small, can create additional risks. Main elements of the design include:

- Maximum and minimum loan amount
- Grace period
- Loan maturity
- Effective interest rate
- Payment schedule (monthly or seasonal payments)
- Collateral requirements
- Currency of the loan

The wrong product design choices can lead to disaster because they do not match the local culture and limitations of the MFI's clients. The MFI can also include the "rules of the game" such as group requirements (meetings), participation in technical training, or forced savings. However, the MFI should consider each requirement's potential impact on the client's ability to pay and its own financial health. The MFI can reduce the risks by proposing loan products designed to reflect the client's preferences, cash-flow profiles and ability to repay, and seasonal and other opportunities or risks.

Portfolio composition

The types of loans in the MFI's portfolio can create or balance the risks inherent in lending money to informal businesses. Understanding the risks should lead to suitable loan loss provisions and reserves. These reserves are a useful instrument in managing this type of risk. Preserving adequate loan loss provisions will permit the MFI to cover the probable losses. This maintenance is usually accomplished by creating reserves based on the length of time a payment is overdue. For instance, an MFI may set up a reserve equal to 25 percent of loan balances with an overdue payment of 30 to 60 days; 50 percent of loan balances with an overdue payment of 61 to 90 days; and 100 percent of those with an overdue payment of more than 90 days. Finally, write-off policies play a complementary role to loan loss provisioning and reserves; a common practice is to write off loans more than 180 days past due.

Loan processing and information management

Another cause of risk includes the processes, practices, and information systems used to track the loan portfolio. A management information system tracks individuals, groups,

sectors, and branches to detect rapidly any threats to strong portfolio performance. Other internally and externally determined risk factors affect an MFI's ability to manage the client development and loan collection processes. The internally determined risk factors include hiring policies, incentive systems, operating policies and procedures, employee evaluations, management information systems and reports, asset and liability management, currency management, and internal controls and audits. External factors are the accessibility and usefulness of credit bureaus, the ease of collateral valuation and recovery, competitive pressures, and the availability of insurance for clients.

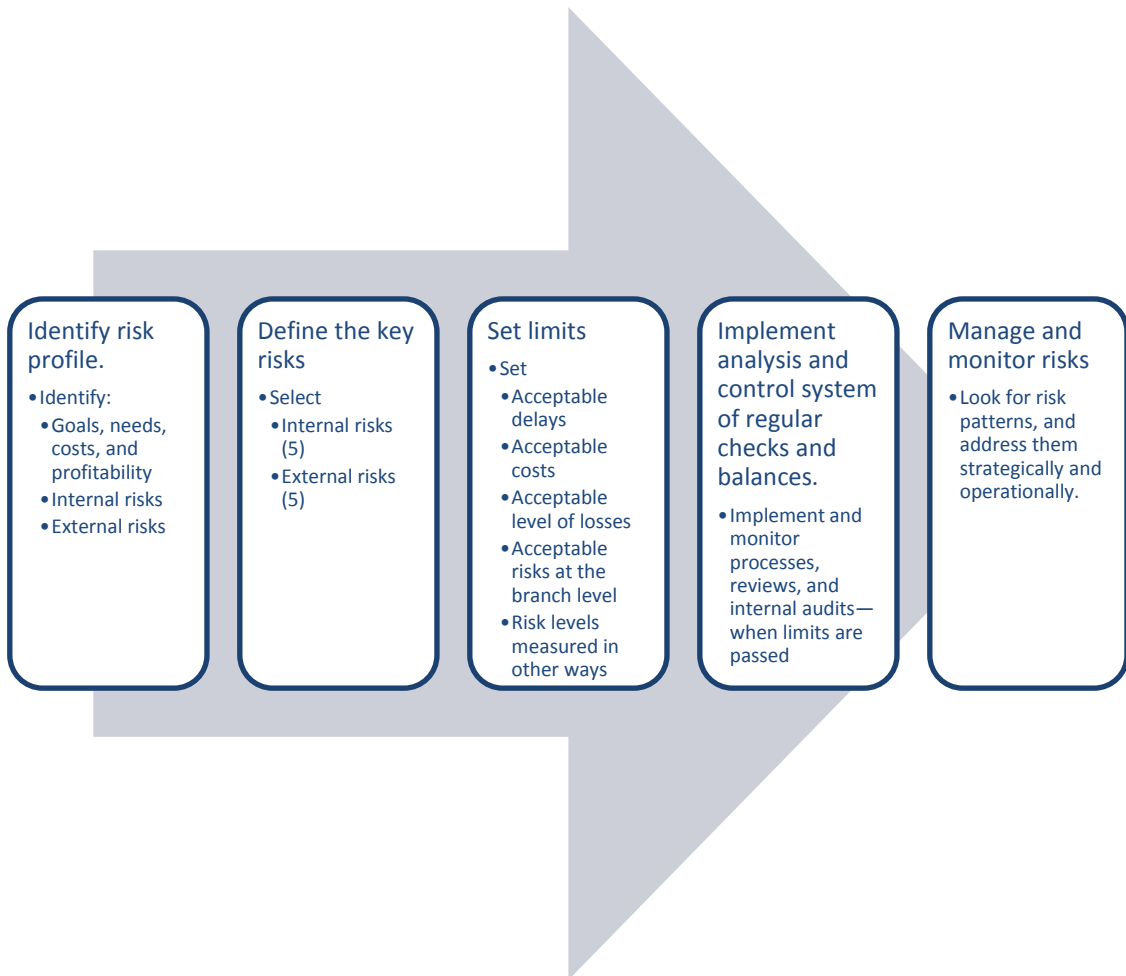
2.2.2 Developing a Risk Management System

It is important that each MFI develops a system for managing risks. Prepare for unexpected events, and the cost this events may bring. All MFI, large or small, regulated or unregulated, should design a risk management system that is based on the institution's particular needs, clients, products, legal status, and internal capacity. The management team is responsible for periodically evaluating the MFI's exposure to risk and deciding its risk management strategy.

We would like now to mention some simple steps that must be present in a Risk Management System. First, identify the institution's exclusive risk profile by analyzing the institution's goals, needs, costs, and profitability. Second step, define those unexpected events, or risks, that are most probable to happen and most important to consider. For each risk the MFI can calculate the possible effects on its loan portfolio and policies. Management should concentrate on the top five internal and external risks. Third, using this breakdown, the MFI sets exposure limits for each line of business, for example, the percentage of loans delinquent beyond 30 days. The fourth step, once a limit has been passed, the institution starts its risk analysis and

control actions. Finally, the MFI fine-tunes the risk management system periodically, reviewing its risk profile and operational systems, as the political and business environments may change over time.

Figure 5 Steps in Risk Management



Source: Mommartz, Rochus *"Introducción a la Gestión de Riesgos y su Contexto."*

For each risk category the MFI assesses the possible effects on its loan portfolio. The portfolio is made of all the outstanding loans, whether they are well-timed or overdue. The loans may be of different size and character (individual or group) and to different productive sectors. According to its mission and strategy, the MFI may have made preferential loans to women or productive sectors. The portfolio

assessment will identify risks and help management to establish a balanced mix of loans. There are some internal and external tools that may help to measure these risk. As an example we report the credit rating methodology used by MicroRate²⁴ and the CAMEL approach used by ACCION International.²⁵

Figure 6 Credit Rating Methodology by MicroRate

Credit Rating Methodology by MicroRate.

Credit ratings measure the risk of default of a microfinance institution's (MFI) obligations. The analysis for this rating includes an examination of quantitative and qualitative factors that assess the institution's capacity to repay its financial obligations. MicroRate's experience shows that both the quantitative and qualitative factors included in this analysis are essential in determining an MFI's repayment capacity. MicroRate's credit rating report also includes an analysis of external factors that are relevant to the institution, including the markets in which it operates and the microfinance environment. The credit rating report analyzes the following factors, following Basel II regulations:

- Country and microfinance sector risk
- Credit risk
- Operational Risk
- Market and liquidity risk
- Financial risk (profitability and solvency)

In order to accurately capture this information, MicroRate starts with a pre-visit desk analysis of data and information collected from the client. This is followed by a thorough on-site evaluation of the institution by two analysts. The on-site evaluation is followed by an analysis of all the data collected which is then consolidated into a final

²⁴ "MicroRate," <http://www.microrate.com>.

²⁵ "Global Development Research Center," www.gdrc.org.

report. Prior to publication, the MFI is provided with a draft version of the report to review in order to ensure that there are no factual errors or misinterpretations. While the review of the draft does not influence MicroRate's overall opinion, it provides the MFI with the opportunity to verify the data collected.



The final rating grade is a result of careful analysis and discussion by an International Rating Committee focusing on the five areas mentioned above. The International Rating Committee is composed of senior management and seasoned analysts from MicroRate's different field offices to ensure consistent, robust analysis. In determining the final rating grade, no one risk is judged as being more important than others. Rather, the overall rating grade is not the result of weighting sub-rating grades, but is focused on the impact of each risk area on the MFI's overall repayment capacity. The credit rating uses the Standard and Poor's rating scale for all countries except in Peru, where MicroRate is regulated by the Peruvian Authority. For Peruvian MFIs, the rating scale uses the letters A to E as mandated by that authority.

Benefits of Rating:

MicroRate's experience and international credibility allow MFI clients to benefit from our knowledge of microfinance to improve performance and attract funding. MicroRate's credit rating enables MFIs to:

- Attract funding
- Compare their performance with international standards
- Comply with standard rating requirements of the regulatory authorities

Rating Process:

MicroRate's credit rating includes a pre-visit desk analysis, on-site evaluation, and final report. The entire process from the desk analysis to final report delivery is about 6-8 weeks.



Source: MicroRate, <http://www.microrate.com/mfis/credit-rating>

Figure 7 Credit Rating Grades

Credit Rating Grades	
Scale	MicroRate rates financial capacity for institutions by emitting an opinion about its financial strength and its ability to repay financial obligations.
A+	Financial institutions that display High Capacity to pay their obligations according to the terms and conditions agreed upon. Minimal sensibility to deterioration caused by potential changes in its sector, context, or the institution itself.
A	
A-	
B+	Financial institutions that display Good Capacity to pay their obligations according to the terms and conditions agreed upon. Low sensibility to deterioration caused by potential changes in its sector, context, or the institution itself.
B	
B-	
C+	Financial institutions that display Sufficient Capacity to pay their obligations according to the terms and conditions agreed upon. Moderate sensibility to deterioration caused by potential changes in its sector, context, or the institution itself.
C	
C-	
D+	Financial institutions that display Insufficient Capacity to pay their obligations. High sensibility to deterioration caused by potential changes in the sector, context, or the institution itself. High risk of failure to repay its obligations.
D	
D-	
E	Financial institutions with not enough information to be rated and/or Inability to repay its obligations.

Source: MicroRate, <http://www.microrate.com/mfis/credit-rating/credit-rating-grades>

Figure 8 Risk Measurement Systems

Risk Measurement Systems

North American bank regulators first adopted the CAMEL methodology to evaluate the financial and managerial soundness of U.S. commercial lending institutions. The CAMEL reviews and rates five areas of financial and managerial performance:

- Capital Adequacy
- Asset Quality
- Management
- Earnings
- Liquidity Management

Using the original CAMEL's conceptual framework, ACCIÓN International developed its own instrument. The ACCIÓN CAMEL reviews the same five areas, but the indicators and ratings reflect the challenges and conditions of the microfinance industry. The methodology requires the MFI to provide the following information:

- Financial statements
- Budgets and cash flow projections
- Portfolio aging schedules
- Funding sources
- Information about the board of directors
- Operations and staffing
- Macroeconomic information

The ACCIÓN CAMEL performs the following adjustments: (1) loan loss provision, (2) loan write-offs, (3) explicit and implicit subsidies, (4) effects of inflation, and (5) accrued interest income. The ACCIÓN CAMEL analyzes and rates 21 key indicators, with each indicator given an individual weighting. The final composite rating is a number on a scale of zero to five, with five as the measure of excellence. This numerical rating corresponds to an alphabetical rating (AAA, AA, A, BBB, BB, B, C, D, and unrated).

Source: Global Development Research Center, <http://www.gdrc.org/>.

All prosperous MFIs implement more than one risk management strategies. They count on strong internal information systems to help managers to recognize and mitigate the risks associated to liquidity, internal fraud, and new product development. They guarantee better information on the cash-flow, efficiency, and other characteristics. Their credit management systems constantly monitors on portfolio quality issues, allowing for quick reactions to intentional default. They recognize the value of micro-insurance to protect borrowers from insurable risks.

3 Case: Compartamos Banco

In this chapter we would like to present the case of Compartamos Banco in Mexico, that is one of the biggest MFIs in Latin America. In recent years it has expanded its operations into Peru and Guatemala. The main objective of this chapter is to present how Compartamos Banco is changing the way to make Microfinance by moving to a more sustainable model.²⁶

3.1 Overview

From its beginning in 1990 until 2000, Compartamos operated as a not-for-profit, nongovernmental organization (NGO). During this period, it received US\$4.3 million in grants or near-grant soft loans from international development agencies and private Mexican sources. The NGO operated mainly in rural areas making small loans to poor and lower income women.

Compartamos reached nearly 60,000 borrowers by 2000. In order to have access to commercial funds for even quicker growth, the NGO and other investors set up a regulated finance company, organized as a for-profit corporation. Around that time ACCION, a not-for-profit international supplier of technical assistance and investment capital to MFIs received from USAID, \$2 million as a grant. With that money, ACCION gave \$200,000 in technical assistance to the Compartamos NGO, provided that NGO \$800,000, which was used to buy stock from the new finance company, and gave \$1 million loan to the finance company as subordinated debt.

The for-profit Compartamos finance company received, in addition to grants and near-grants, over \$30 million in loans from

²⁶ The information used for writing this chapter comes from two main sources. First, the annual sustainable reports of Compartamos from 2011 and 2012. Second, some personal interviews made by the author directly in Compartamos Banco headquarters at Mexico City. We would like to express our gratitude to Liz Escamilla and Carlos Danel for allowing us to have this first-hand information.

public development organizations and \$15 million from private socially oriented investors. These loans were normally at market interest rates or above.

Starting in 2002, Compartamos was able to issue approximately \$70 million in bonds on the Mexican securities exchange (Cebures). Most of these bonds were in part guaranteed by the International Finance Corporation (IFC, a private-sector investment arm of the World Bank), which charged a fee of 2.5 percent of sums guaranteed. In addition, the company raised nearly \$65 million by borrowing from Mexican banks and commercial lenders.

In June 2006, the finance company received a full banking license (Banca Multiple, in Mexican regulation terms). As a bank, Compartamos is authorized to receive deposits, but had not done so up to the point of the IPO in April 2007. By the end of 2006 the company was serving 616,000 borrowers and presumes to continue its quick expansion.

Brief History of Compartamos

1990	Established as NGO
2000	Moved operations to regulated for-profit finance company
2002	Issued debt for first time on Mexican bond market
2006	Authorized by Mexican government to operate as full-service bank (Banca Multiple)
2007	Initial Public Offering
2011	Expanded operations to Guatemala and Peru (Financiera CREAR)

By the end of 2010 the holding company Compartamos SAB de CV was established, and the corporate structure was changed in order to be more focused on the different duties each division has. In 2012 the structure was the following:



Aterna was created in the year 2012. This new Aterna line of business positioned the company in the micro-insurance sector in Mexico and the Americas with 3,178,887 active policies. Its ultimate goal is to promote a prevention culture at the Base of the Pyramid, to contribute to the prevention-risk balance that must exist in the region's microfinance sector.

In the 2012 Annual and Sustainable report, Compartamos group state out as a mission:

We are a group of companies committed to eradicating financial exclusion at the Base of the Pyramid in the Americas, aspiring to generate social, economic and human value for people through financial inclusion.

Currently they are offering products and services in the following categories:

- Microcredits
- Savings products

- Insurance
- Payment channels
- Financial education

The offer this products and services though the following subsidiaries:



With self-accomplished individuals, we aim to become the leading bank for the low income sector by expanding the boundaries of the financial sector to offer savings, credit and insurance services.



Become the largest network offering points of sale for financial transactions and others in Mexico and the Americas.



Become the insurance consulting firm for the Base of the Pyramid by designing and operating the right products and services through our partners in Mexico and the Americas.



With self-accomplished individuals, we aim to become the company specialized in microcredits that grant development opportunities by expanding the boundaries of the financial sector.



With self-accomplished individuals, we aim to become the leading financial institution for the low income sector by expanding the boundaries of the financial sector to offer savings, credit and insurance services.

Figure 9 Compartamos Group presence in America



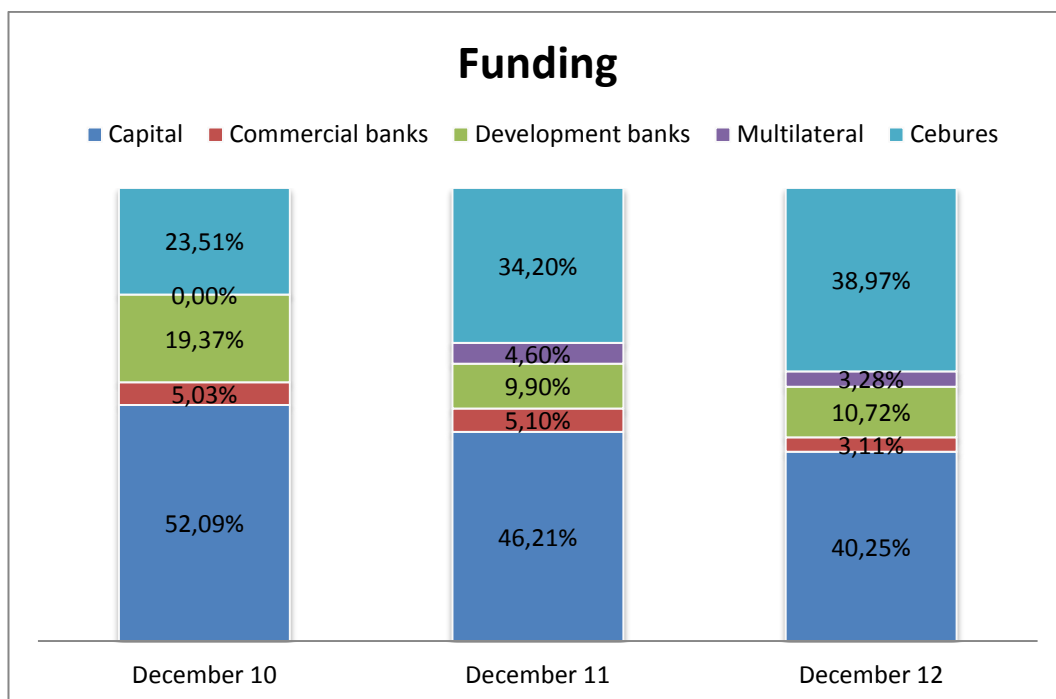
By the end of the year 2012 they have reached 2,675,758 clients, 8% more than in 2011. Their total portfolio was \$18,161 million pesos (approx. \$1,395 million US dollars). The average balance per client was 6,787 pesos (approx. 522 US dollars). And the non-performing loan ratio was 2.88%.

3.2 Funding

Since the transformation of Compartamos Banco from a NGO to a full-service bank in 2006 and the IPO on 2007, Compartamos change the way the funded their activities. They moved away from relying in subsidies from international development agencies, and approach the financial markets. Their IPO on 2006 has been seen by many microfinance experts as a change in the way of doing microfinance more sustainable. Many authors refer to this as the commercialization of microfinance. Banco Compartamos's sale was not the first public offering in microfinance. Bank Rakyat Indonesia (BRI) listed on the Jakarta Stock Exchange in 2003, and Kenya's Equity Bank went public

in 2006. Furthermore, commercial financing through debt has always been a part of the microfinance funding mix. But the Banco Compartamos public offering is different because of the bank's origins. Whereas BRI was government-owned until its public offering, and Equity Bank initially focused on offering mortgage services, Banco Compartamos, like most microfinance institutions, owes its existence to donor support. Banco Compartamos originated as a donor-funded NGO with a pro-poor mission. However, its management, recognizing the limitations of soft financing, decided to reorganize as a for-profit company. It reasoned that tapping commercial sources of funding would allow the bank to expand its outreach dramatically, and it did: its client base grew from 60,000 in 2000 to over 800,000 in 2007.

<i>Funding</i>								
	COMPARTAMOS BANCO FUNDING MEXICO			FINANCERA CEAR FUNDING PERU			COMPARTAMOS, S.A. FUNDING GUATEMALA	
	DEC. 2010	DEC. 2011	DEC. 2012	DEC. 2010	DEC. 2011	DEC. 2012	DEC. 2011	DEC. 2012
Cebunes	23.51%	34.24%	38.97%	56.32%	48.9%	-	-	-
Multilateral	0.00%	4.56%	3.28%	6.51%	5.5%	3.68%	-	-
Development bank	19.37%	9.88%	10.72%	19.21%	25.5%	30.75%	-	-
Commercial Banking	5.03%	3.58%	3.11%	7.61%	9.0%	13.21%	-	-
Capital	52.09%	46.21%	40.25%	10.34%	11.24%	13.17%	100%	100%
Investment funds	-	-	-	56.32%	48.9%	39.2%	-	-
New deposits	0.00%	1.57%	3.68%	-	-	-	-	-
	100 %	100%	100%	100%	100 %	100%	100%	100%



3.2.1 Equity²⁷

Compartamos Stockholders' equity is made up of Paid-in capital and Earned capital. The paid-in capital category is mainly made of Capital Stock for \$4,629 (\$356 US dollars) represented by 1,662'382,704 shares of a single series, with no par value indicated. These shares are traded in the Mexican stock exchange market (BMV). Stock ticker: COMPARC.

Figure 10 COMPARC Stock Performance

<i>STOCK PERFORMANCE</i>	2011	2012	VAR.% 12/11
Price (Ps.)	17.1	18.4	7.6%
Average daily amount traded (Ps. million)	68.5	56.2	-18.2%
Average daily volume traded (Ps. million)	3.3	3.6	9.1%
Market capitalization (Ps. million)	7,377	8,644	17.2%
CPI (Points)	37,077	43,706	17.9%
Market capitalization value (Ps. million)	26,650	30,538	10.4%

²⁷ All the amounts are in millions of Mexican pesos unless it is specified otherwise. The exchange rate at December 31, 2012 was USD/MXN 13.01 according to the Mexican central Bank.

Figure 11 Comparison chart between Compartamos Stock (COMPARC) vs Mexican Stock Exchange Index for Financial services (ST4000.MX)²⁸



The Earned capital is principally made of statutory reserves for \$602 and the net income for 2,010. The Total stockholders' equity is \$8,644 which is 37.85% of the total liabilities and stockholders' equity.

3.2.2 Bank and other loans

Compartamos has contracted several loan agreements. Not all of them are fully used. The total demand for short term loans was \$1,200 (\$92 US dollars) of which \$402 are from Development Banks, and \$798 from other institutions.

The total amount of long term loans is \$4,137 (\$318 US dollars), of which \$522 are from multiple banking institutions, \$1,400 from development banks and \$2,215 from other institutions.

Compartamos has also lines of credits for a total amount of \$10,138 (\$779 US dollars) of which the portion used in 2012 was \$4,823 which is a 47.5% of used.

²⁸ Information from <http://mx.finanzas.yahoo.com> date: 20/05/2013

3.2.3 Deposits Funding

Deposit funding includes deposits on demand, time deposits and debt securities issued.

The demand deposits were \$30 (\$2.3 US dollars) and have an interest rate of 2% for the year 2012.

As time deposits Compartamos has a liability for issuing certificates of deposit (Cedes-Spanish acronym) for \$601 (\$600 of principal and \$1 of interest accrued in 2012) (\$46.2 US dollars) which accrued interest at the 28 days TIIE plus 0.30 bp with maturity on October 29, 2013.

In the debt securities issued category, Compartamos has a series of long term debt securities (Cebures-Spanish acronym), issued in Mexican pesos for a total amount of \$6,549 (\$504 US dollars). Their structure is as follows:

CEBURES	AMOUNT OF PROGRAM	DATE OF ISSUANCE	DATE OF MATURITY	INTEREST RATE	BALANCE
COMPART 10	\$ 1,000	October 2010	October 2015	TIIE 28 Días + 130 pb	\$ 1,000
COMPART 10*	\$ 1,500	December 2012	October 2015	TIIE 28 Días + 130 pb	1,500
COMPART 11	\$ 2,000	September 2011	September 2016	TIIE 28 Días + 85 pb	2,000
COMPART 12	\$ 2,000	August 2012	August 2017	TIIE 28 Días + 70 pb	2,000
					6,500
Interest payable					21
					6,521
Premium carryforwards of the reopening of COMPART10					28
Total debt issuance					\$ 6,549

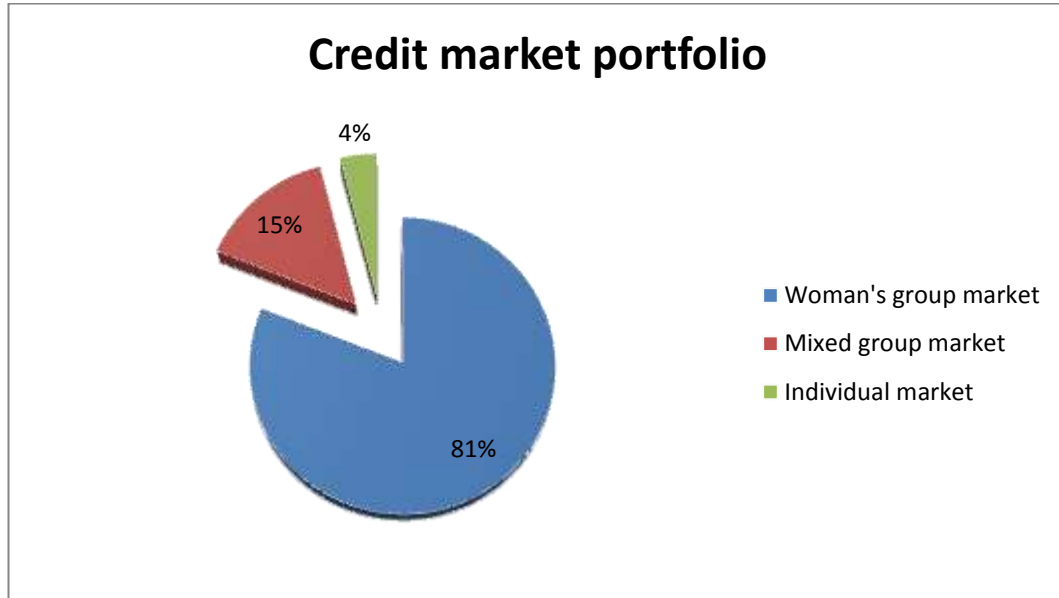
* Reopening

3.3 Products

Compartamos fights financial exclusion by offering access to competitive and quality financial services that meet their clients' real needs and generate inclusion, development and empowerment.

3.3.1 Credits

The credits offered by the bank can be divided into three categories Woman's Group Market, Mixed Group Market and Individual Market.



Distribution of clients by product

Market	Number of Products	No. of clients	% of Market
Woman's group market	Crédito Mujer	1.988.939	80.53%
	Crédito Adicional	94.446	4.74%
	Crédito Mejora tu Casa	255.541	12.84%
Mixed group market	Crédito Comerciante	376.520	15.24%
Individual	Crédito Individual	104.502	4.23%
Total number of clients		2.469.961	100%

Woman's Group Market

- Crédito Mujer

Individual working capital loan with a joint guarantee for women belonging to groups of 12 to 50 members. Clients receive a Basic Life Insurance Policy (SBV) for Ps. 10,000 free of charge as well as a discount card. Clients can also purchase a life insurance policy, if they wish, in addition to the SBV. In case of death, Compartamos Banco forgives the debt and the beneficiary is given the full amount of the insurance policy.

Amounts: between Ps. 2,500 and Ps. 30,000 (\$192 to \$2,306 US dollars)

Term: 16 weeks (8 biweekly meetings)

Portfolio: Ps. 9,164 billion (\$704 billion US dollars)

Number of clients: 1,988,939

- Crédito Adicional

Seasonal and working capital opportunity loan offered along with Crédito Mujer.

Amounts: between Ps. 750 and Ps. 6,000 (\$57 to \$461 US dollars)

Term: 4 to 11 weeks (three to five biweekly meetings)

Portfolio: Ps. 158 million (\$12 million US dollars)

Number of clients: 94,446

- Crédito Mejora tu Casa

Loan targeting “Crédito Mujer” clients to finance their business and/or improve their homes.

Amounts: between Ps. 5,000 and Ps. 30,000 (\$384 to \$2,306 US dollars)

Term: 6 to 24 months

Portfolio: Ps. 2,186 billion (\$168 US dollars)

Number of clients: 255,541

Mixed Group Market

- Crédito Comerciante

This is a loan for individuals that belong to a group and need short-term financing for working capital and/or to invest in their legitimate economic business or service. Groups, in this case, must have between 4 and 20 members. They have the option to voluntarily purchase a Seguro de Vida Integral (comprehensive term life insurance) policy. In case of death, the designated beneficiaries are forgiven the outstanding balance.

Amounts: between Ps. 3,000 and Ps. 30,000 (\$230 to \$2,306 US dollars)

Term: 8, 10 and 12 biweekly payments

Portfolio: Ps. 1,697 billion (\$130 billion US dollars)

Number of clients: 376,520

Individual Market

- Crédito Individual

This product is an individual loan designed for people who operate a legitimate business as commerce or production or service providers and need financing for working capital and/or fixed assets due to the nature of their business.

Amounts: between Ps. 8,000 and Ps. 100,000 (\$615 to \$7,686 US dollars)

Term: between 4 and 24 month

Portfolio: Ps. 1,399 billion (\$107 billion US dollars)

Number of clients: 104,502

3.3.2 Insurance

The insurance products are offer through Aterna. There are three areas in which they work: Life, Health and Damage.

- Life

Life insurance products offer clients peace of mind that their families will not be unprotected when they are gone.

- Health (accident and health insurance)

Accidents, illnesses or emergencies can destabilize a family's economy. Compartamos cares for their clients and their loved ones by protecting their physical safety.

- Damages

Compartamos knows how hard it is to build an estate, and thus offer their clients the opportunity to protect their properties from accidents or natural disasters.

Figure 12 Aterna (insurance) in numbers

<i>Insurance – Aterna</i>	2012
Employees	32
Distribution channels	4
Number of policies sold	10,727,413
Active policies	3,178,887
Claims serviced	3,987
Insured sum paid to beneficiaries (Ps. million)	107

3.4 Risk Management

The Bank recognizes that its core business is to assume risks in search of potential financial and social returns. Consequently, Comprehensive Risk Management (CRM) is a central component of the business' strategy for identifying, measuring, overseeing and controlling the different types of risks faced during the ordinary course of operations.

The Bank's CRM is considered to be an on-going process involving all levels of management. The structure for the Bank's CRM is based on the following guidelines:

- a. Commitment by the Top Management and the Board of Directors to properly manage risks encountered.
- b. On-going supervision of CRM policies and procedures.
- c. Clear segregation of duties to ensure independence and objectivity in risk management.
- d. Formal cooperation between the CRM structure and the business units.
- e. Clear determination of responsibilities pertaining to CRM.
- f. On-going supervision of the Internal Control and Audit area, to ensure proper compliance with CRM duties.

The Board of Directors has set up a Risk Committee to ensure that operations are conducted in line with the objectives, policies and

procedures for CRM, as well as with the exposure limits approved by said committee. This committee meets at least once a month and works in accordance with the guidelines set out in the General dispositions applicable to credit institutions.

The Risk Committee is aided by the Comprehensive Risk Management Unit (CRMU) for identification, measurement, oversight and disclosure of risks as per the General Provisions Applicable to Credit Institutions in effect and applicable best practices.

CRM is mainly based on the determination of a structure of global and specific limits, and on the application of risk methodology authorized by the Board of Directors.

3.4.1 Credit risk

Credit risk management considers: identification, quantification, establishing of limits, risk policies and risk monitoring, potential losses due to borrower or counterparty default in operations with financial instruments.

The Bank's loan portfolio at December 31, 2012 is made up mainly of loans in Mexican pesos with an average term of four months with a fixed rate and joint guarantee of the borrowers. Capital and interest are mainly paid weekly. Loans are made to individuals for a specific purpose (consumer portfolio). The consumer portfolio is sufficiently diversified to represent no concentration risk and there is a scarce value of individual positions. This diversification is both geographical and by industrial sector (as shown in the figures below). The commercial loans, despite being focused on a single counterparty, have the lowest risk according to the rating given.

Figure 13 Client diversification by industry

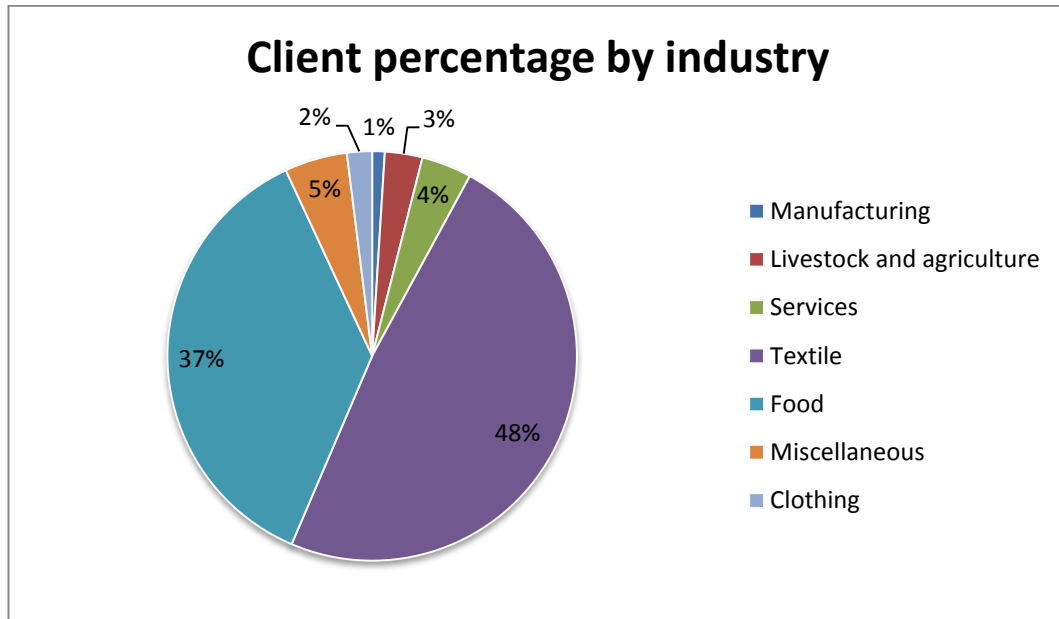
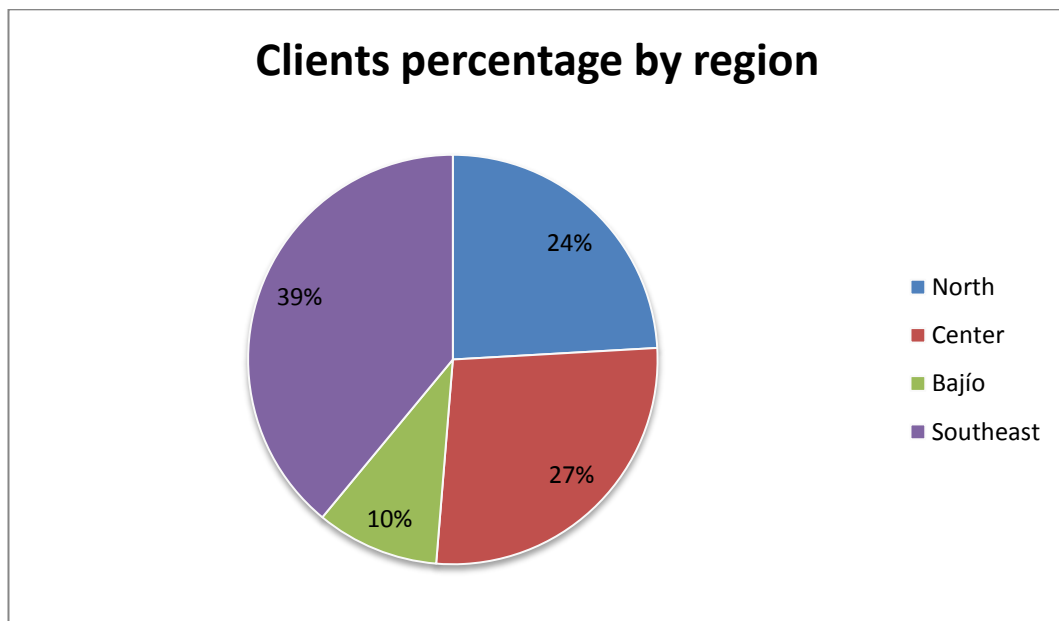


Figure 14 Client diversification by region



In accordance with the criteria set forth in paragraph 70 of "International convergence of capital measurements and capital standards" Basel II, the Bank classifies its own loan portfolio as retail portfolio.

In December 31, 2012, the portfolio is comprised of 2.8 million loans (2.6 million in 2011), the average outstanding balance in 2012

has remained at approximately \$5,127 Mexican pesos (\$4,537 Mexican pesos for 2011), at an average term of four months.

The maximum authorized amount for a loan is \$100,000 Mexican pesos (\$7,686 US dollars), as a result of which, the maximum financing limits established in the provisions for one individual or group of individuals representing a common risk were complied with no exceptions. In addition, no operations were conducted with customers considered an individual or group of individuals who, comprising one or more liability operations payable by the Bank, exceeded 100% of the basic capital.

Analyses of quality of the loan portfolio and credit risk rating thereof are conducted at least monthly. The loan process is based on an in-depth analysis of loan applications in order to determine the overall risk of the borrower. Loans are rated as per the methodology. Rating-based distribution of the loan portfolio, that could be interpreted as the risk profile of the Bank's loan portfolio, shows its greatest concentration in rating A, current portfolio.

Figure 15 Rated portfolio in 2012

Rated portfolio	Risk					Total
	A	B	C	D	E	
Commercial	\$226	\$11	\$1	\$3	\$6	\$247
Consumer	\$9,066	\$7,945	\$257	\$526	\$88	\$17,882
Residential	\$17	\$9	\$5	\$1	-	
Total	\$9,309	\$7,965	\$263	\$530	\$94	\$18,161

Figure 16 Required allowances for 2012 portfolio

Required allowance	Risk					Total
	A	B	C	D	E	
Commercial	\$1	\$1	\$1	\$2	\$6	\$11
Consumer	\$26	\$415	\$100	\$381	\$88	\$1,010
Residential	-	\$1	\$2	-	-	
Total	\$27	\$417	\$103	\$383	\$94	\$1,024

The measurement methodology used in calculating expected and unexpected losses arising from the portfolio's credit risk is a Credit Risk+ model. The risk exposure considered by the model is that of the loan portfolio that has shown no default at the date of the analysis, defining default as an event in which a loan has not been paid in the allotted time and in the proper form.

The expected loss is calculated, multiplying the exposure of the operation by the likelihood of default by the borrower, using the aforementioned rating model for assigning of likelihood of default, mentioned above.

The expected loss pertaining to the portfolio under consideration as of December 31, 2012 represents 1.6% of the overall balance exposed to default. The Bank has set up loan loss reserves totaling \$761 (\$58 US dollars), equivalent to 5.1% of the balance of the overall portfolio.

Expected and unexpected losses are calculated monthly under different scenarios (sensitivity analyses), including stress scenarios. The results of the analyses are presented to the areas involved in portfolio risk management, to the Chief Executive Officer's Office and to the Risk Committee.

With respect to credit risk management for operations with financial instruments or counterparty risk, the credit risk exposure in

operations with financial instruments, and the expected and unexpected loss thereof, are calculated on a daily basis. Said allowance forms part of the daily report on market risk. In December 31, 2012, the Bank's position in financial instruments subject to counterparty risk totals \$1,322; 62% in call money operations and 38% in direct positions in CETES and PRLVs. The expected loss pertaining to counterparty risk is 4.5% of the overall exposure.

The methodology for managing credit risk in financial operations consists of an economic capital type model which generates an allocation of capital that must be available to cover the losses.

Likelihood of default: This information is obtained from 4 sources, which are used in the following order: 1) Standard & Poors; 2) Moody's; 3) Fitch, and 4) in the event the Bank has no rating from any of the 3 agencies, an average rating is assigned according to its group. The above grouping refers to the group to which it pertains in the market (P8, AAA, P12, other). In the event of rating differences, the lowest rating is used.

In order to reduce risk exposure related to movements in interest rates or exchange rates, operations with derivative financial instruments conducted by the Bank are merely intended for hedging purposes.

3.4.2 Market risk

Market risk management considers, at least, identification, quantification and establishing of limits and monitoring of risks arising from changes in the risk factors affecting the valuation or expected results of active or passive operations or those giving rise to contingent liabilities.

In December 31, 2012, the Bank's portfolio of financial instruments subject to market risk is comprised just of Call Money operations and purchase of CETES and PRLVs. As a result, the main risk factors that could affect the value of the investment portfolio are

interest rates, spreads, and the prices of other financial instruments. It should be mentioned that the Bank's treasury operation is limited to investment of cash surpluses from the credit operation.

The means for measurement of risk assumed by the Bank to manage this type of risk is the Value at Risk (VaR), which is calculated daily.

VaR is an estimation of the potential loss in value of a determined period of time given the level of confidence. The method used by the Bank is the historical simulation method.

The market VaR is calculated daily, including the main positions, asset and liability, subject to market risk shown in the balance sheet, which is also used for interest rate risk management. The daily average VaR of the Bank in 2012 was \$46,756 Mexican pesos (\$3,594 US dollars), corresponding to 0.0007% of the last known net capital as of December 31, 2012.

As part of the market-risk management process, back-testing, sensitivity and stress scenario tests are conducted.

Back-testing is conducted monthly to compare the losses and gains that would have been observed had the same positions been maintained, considering only the change in value due to market movements, against the calculation of the VaR. This allows for evaluating the accuracy of the prediction. To date, testing has been highly effective by more than 94.6%.

The sensitivity analyses conducted periodically normally consider movements of ± 100 base points in rates or risk factors. Whereas to generate stress scenarios, movements of ± 150 base points are considered in rates or risk factors.

3.4.3 Liquidity risk

Liquidity risk management includes, at least, identification, measurement and establishment of limits and follow up on risks or

potential losses arising from the impossibility or difficulty of renewing liabilities or of contracting others under normal Institution conditions due to early or forced sale of assets at unusual discounts to settle its obligations, or to the fact that a position cannot be promptly sold, acquired or hedged by means of establishing an equivalent contrary position.

The Banks's business model is based on its reputation as a solid institution that always responds to its customers' credit needs. Therefore, liquidity risk management is an essential element for timely prevention of the differences arising from the possible "gap" between its main positions in terms of liquidity risk: expected cash flows (payments on current loans) and projected outflows (current expenses, placement of new loans).

The measurement methodology used in liquidity risk management is:

- Liquidity gap analyses consider the Bank's main assets and liabilities, whether recorded on or off the balance sheet, establishing maturity bands according to the characteristics of the products offered. A limit is established for each bucket.
- Liquidity Value at Risk (liquidity VaR) for measurement of the market's liquidity risk determines the possible inability to liquidate positions in one day and is calculated in the same way as the market VaR with a 10-day horizon.

In December 31, 2012, the quantitative information for the analysis of liquidity gaps is as follows:

Figure 17 Analysis of liquidity gaps 2012

Analysis of liquidity gaps 2012

Buckets	Gap	Limit	Use of limit (%)
1-30 days	4,920	80%	0%
31-60 days	4,188	149%	0%
61-90 days	2,287	186%	0%
91-120 days	1,033	203%	0%
121-180 days	770	216%	0%
181-270 days	750	228%	0%
271-360 days	(267)	224%	0%
361-720 days	(1,444)	200%	0%
721-1080 days	(2,688)	213%	0%
1,081-1440 days	(2,199)	120%	0%
1441-1800 days	(1,491)	-24%	24%

The Bank's total assets at December 31, 2012 were \$17,286 (\$1,327 US dollars).

Differences in flows (gaps) show excesses (greater asset flows than liability flows) in the first buckets, which is natural for the type of operations handled by the Bank, as 82.0% of the assets considered correspond to cash flows arising from recovery of loans with an average term of four months and investments at terms below 180 days, while liability flows correspond to financing contracted at the short and medium term maturity date, giving rise to a positive accumulated gap over 360 days, at the end of 2012, of \$8,330 (\$640 US dollars).

The average liquidity VaR for 2012 was \$81,120 Mexican pesos (\$6,235 US dollars), equivalent to .001% of Bank's net capital. Sensitivity and stress tests are also conducted for liquidity risk management.

Diversification of the Bank's sources of financing are assessed periodically. The diversification is evaluated through the liquidity indicators, mentioned above.

Additionally, in complying with the General Provisions Applicable to Credit Institutions, there is a Liquidity Contingency Plan in place, the purpose of which is to ensure that the Bank will be able to face its daily obligations under any circumstances, including a liquidity crisis; said Plan has been included in the policies and procedures manual for CRM.

3.4.4 Operational risk

Operational risk can be defined as the potential loss due to defects or deficiencies in internal controls resulting from errors in processing and storing operations or in the transmission of information, as well as to adverse administrative and legal rulings, fraud or theft, and it includes legal and technological risks.

In the Bank's methodology, management and control of operational risks include the following matters, among others:

The processes that describe each area's duties are identified and documented. The Bank has areas engaged in developing and documenting methods, procedures and processes under the Internal Control Director's Office.

Inherent operational risks and the controls pertaining to the processes that describe the Bank's substantial processes under "Risk and Control Matrixes" are identified and documented. Additionally, the internal audit area has implemented its audit model based on risks.

Consequences for the business arising from materialization of identified risks are assessed and reported to the heads of the areas involved, to the Chief Executive Officer and the Risk Committee. Each area must be aware of and participate in the control and management of own risks.

A historical database is maintained through systematic recording of the different loss events and their effects on the accounting records. Those events are duly identified through classification per business unit within the Bank, and are recorded in the Operational risk system.

A global level of tolerance has been established for operational risks, taking into account the causes, origin and risk factors thereof.

Loss events related to operational risks, including technological and legal risks, are recorded systematically, with an association to the corresponding lines of business or business units, as well as to the type of loss. The Bank considers events of fraud or asset damage to be its main exposures.

There is a Business Continuity Management (BCM) Plan in place that includes a Disaster Recovery Plan (DRP) focusing on technological risks, as well as a Business Contingency Plan (BCP). Special officers are designated to ensure that such plans are duly updated.

3.4.5 Technological risk

One important aspect of operational risk management is that pertaining to technological risk, which involves potential loss due to damage or failure from use or reliance on hardware, software, systems, applications, networks and any other means of conveying information in the Bank's supply of services to its customers. There are policies and procedures in place intended to minimize the negative impacts of materialization of technological risks such as: historical filing of all operations and transactions entered into, daily reconciliations, contingency policies in the event of: electrical power failure, communication failure, acts of vandalism, and natural disasters, among others.

Due to the nature and characteristics of the market served by the Bank, there are no channels of distribution for banking operations conducted with customers via the Internet.

3.4.6 Legal risk

With respect to legal risk management, the Bank has implemented policies and procedures for minimizing this risk, which include the following matters:

- i. The review and approval of all agreements by the Legal Director's Office to ensure proper instrumentation of agreements and contracts.
- ii. Detailed management of powers granted to the Board of Directors, so as to avoid misuse.
- iii. Procedures for filing and safeguarding agreements and other legal information.
- iv. Preparation of reports on the likelihood of issuance of adverse legal or administrative rulings. The reports are prepared at least on a quarterly basis.

The Bank estimates that materialization of operational risks identified would generate an annual loss of no more than 0.4% of the Bank's annual income, which is considerably below the authorized level of tolerance, which is the same at the end of year.

Conclusion

The fight to end poverty in the world will continue with new ways and with innovations that will allow people to live in a better situation. One of the main questions that is still to be answered is if there is really the possibility to live in a poverty-free world. Many efforts have been done and the answer can be found in human solidarity. There is no doubt the a free market economy as organized today has still not provide solutions for all social ills. The economics opportunities for the poor, health care, education, taking care of the elderly and retarded, are some examples of the areas that are missed. Governments play an important role in this areas, but some authors argue that this areas should be address by the private sector, a social-consciousness-driven private sector.

The problem of poverty goes beyond the differences of language, race and custom. For that reason micro-credit has near worldwide applications. We are convinced that credit is a universal instrument that unlocks human capabilities. Many experiences from the Arctic to the Andes, from Chicago to China shows that the microfinance does not require any specific culture to succeed. A good idea will always win through. Banking will never be the same again.

Critics have been also made to the microfinance movement and in a particular way to microcredit. They often state out the it does not contribute to the development of a country, or even if it does, it is a very insignificant part. It this critics often miss the point in defining economic development, that is many times measure as per capita income, or per capita consumption, or anything else per capita.

There is a difference between economic growth of a country and economic development. They are not synonymous. They do not move at the same speed, and many times not even in the same direction. We believe economic development is about working with the lower 25 percent of the population, changing the quality of life of this lower part. Meaning that economic development may bring latter on

economic growth. They work at different levels of society, in different layers. These layers are not always linked. Some authors use the image of a train to explain the economic growth of a country, and all one needs is the engine to move, so that the entire train and everyone in it move at the same speed. Continuing with this image we may argue that the train can be drawn by the front or pushed from behind, or both. Adding to this image that in human society, each economic entity or group has its own engine, the power of all of them together pushes or pulls the economy forward. Microcredit is about starting up those little economic engines at the rear of the train. They may be little engines but all together can cause a bigger effect. That will continue to push the economic growth of the country even if the big locomotive in the front fails to do its job.

We believe the microfinance industry will continue to grow. This growth is not only pursued by the microfinance institutions but also in many cases is needed in most countries because the un-served markets are still very large and not fully covered. It is important for Microfinance institutions to pursue this growth in terms of breadth, depth, and scope of outreach, without ignoring to continue to develop a risk management system according to this growth. Risk management will continue to gain more and more importance in the next years if we want this growth to be sustainable.

Other issues such as the increasing competition in markets and the incorporation of new technology into the business emphasize the importance of microfinance risk management. The growing interest of Microfinance institutions in agricultural microfinance reinforces the importance of risk management.

However, it is alarming to see that systematic risk management is still not as common as it should be. The augmented importance on microfinance risk management at the level of international agents of microfinance has not yet had its full effect on most institutions at the retail level. Many do not seem to pay much attention to systematic risk

management. Many continue to pursue growth without much attention to related risks. Even simple credit risk management, upon which the industry's growth prospects have been built historically, is ignored by many. Many small institutions have a tendency to focus their resources on crisis management discreetly on the assumption that it is the same as risk management.

As institutions grow, it is not enough just to manage credit risk and operational risks like the risk of fraud. Real risk management requires not only identifying frequent risks but also identifying those that, while unlikely to occur with great frequency, may cause high-magnitude impact when they do occur. Institutions managers and board members must begin to pay attention to macro-economic and systemic trends and develop strategies to address them. If not properly addressed can run an institution into bankruptcy.

Bibliography

- Akerlof, G.A. *The Market for "Lemons": Quality Uncertainty and the Market Mechanism*, 2003.
- Armendariz, Beatriz, and Marc Labie. *The Handbook of Microfinance*. Hackensack, N.J: World Scientific, 2011.
- Armendariz, Beatriz, and Jonathan Morduch. *The Economics of Microfinance*. Cambridge, Mass: MIT Press, 2010.
- Bruett, Till. "Four Risks That Must Be Managed by Microfinance Institutions." *Microfinance Experience* (2004).
- Churchill, C.F., and C. Frankiewicz. *Making Microfinance Work: Managing for Improved Performance*. International Labour Office, [International Training Centre], 2006.
- Compartamos Banco. "Annual and Sustainable Report 2011." Compartamos Banco, December 2011. <http://www.compartamos.com/wps/portal/Grupo/InvestorsRelations/FinancialInformation>.
- . "Annual and Sustainable Report 2012." Compartamos Banco, December 2012. <http://www.compartamos.com/wps/portal/Grupo/InvestorsRelations/FinancialInformation>.
- "Compartamos: From Nonprofit to Profit." *BusinessWeek: Magazine*, December 12, 2007. <http://www.businessweek.com/stories/2007-12-12/compartamos-from-nonprofit-to-profit>.
- De Aghion, Beatriz Armendáriz, and Jonathan Morduch. *Microfinance: Where Do We Stand*. London: Palgrave Macmillan, 2004.
- Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). *A Risk Management Framework for Microfinance Institutions*. Frankfurt: GTZ, 2000.
- Dichter, Thomas W., and 1935 Harper, Malcolm. *What's Wrong with Microfinance?* Rugby, Warwickshire, UK: Practical Action Pub, 2007.
- Drake, Deborah, Elisabeth Rhyne, and ACCION International (Organization). *The Commercialization of Microfinance: Balancing Business and Development*. Bloomfield, Conn: Kumarian Press, 2002.
- Fernando, Nimal A. *Managing Microfinance Risks: Some Observations and Suggestions*. Metro Manila: Asian development bank, 2008.
- Ghatak, Maitreesh. "Group Lending, Local Information and Peer Selection." *Journal of Development Economics* 60, no. 1 (October 1999): 27–50. doi:10.1016/S0304-3878(99)00035-8.
- Ghatak, Maitreesh, and Timothy W. Guinnane. "The Economics of Lending with Joint Liability: Theory and Practice." *Journal of Development Economics* 60, no. 1 (1999): 195–228.
- "Global Development Research Center," www.gdrc.org.
- Goldberg, Mike, and Eric Palladini. *Managing Risk and Creating Value with Microfinance*. Washington D.C.: World Bank, 2010.

- Hartmann, B., and J. K. Boyce. *A Quiet Violence: View from a Bangladesh Village*. Zed Press, 1983.
- La Torre, Mario, and 1975 Vento, Gianfranco A. *Microfinance*. New York: Palgrave Macmillan, 2006.
- Lascelles, David, Sam Mendelson, and Centre for the Study of Financial Innovation. *Microfinance Banana Skins 2011: The CSFI Survey of Microfinance Risk: Losing Its Fairy Dust*. Tonbridge: CSFI, 2011.
- Lucas, Robert E. "Why Doesn't Capital Flow from Rich to Poor Countries?" *The American Economic Review* 80, no. 2 (1990): 92–96.
- Maes, J.P., and L.R. Reed. *State of the Microcredit Summit Campaign Report 2012*. Microcredit Summit Campaign, 2011.
- "MicroRate," <http://www.microrate.com>.
- Mommartz, Rochus. *Introducción a La Gestión de Riesgos y Su Contexto*. Paper Presented at a Workshop at the World Bank. Washington, D.C, 2006.
- Powers, Jennifer. *Shifting Technical Assistance Needs for Commercial MFIs: A Focus on Risk Management Tools*. New York: Banyan Global, 2005.
- Ray, Debraj. *Development Economics*. Princeton University Press, 1998.
- Rosenberg, Richard. "CGAP Reflections on the Compartamos Initial Public Offering." *Focus Note* 42 (2007).
- Sundaresan, Suresh M. *Microfinance: Emerging Trends and Challenges*. Northampton, MA: Edward Elgar, 2008.
- Tchakoute-Tchuigoua, Hubert. "Active Risk Management and Loan Contract Terms: Evidence from Rated Microfinance Institutions." *The Quarterly Review of Economics and Finance* 52, no. 4 (November 2012): 427–437. doi:10.1016/j.qref.2012.08.001.
- Udry, Christopher. "Credit Markets in Northern Nigeria: Credit as Insurance in a Rural Economy." *The World Bank Economic Review* 4, no. 3 (1990): 251–269.
- Yunus, M. *Banker to the Poor: Micro-Lending and the Battle Against World Poverty*. e-book. Aurum Press. Kindle Edition., 2012.