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## Microfinance for housing in Nicaragua

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**Microfinance for housing  
in Nicaragua:  
is joint-liability an  
effective mechanism?**

Melchior Bauer

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# **Micro-finance for housing in Nicaragua: is joint-liability an effective mechanism?**

Melchior Bauer

Groningen, January 2004

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## Abstract

Most of the poor are not able to borrow, because they have no collateral to pledge. Microfinance institutions use small short-term loans in order to reduce the risk of default. In addition, some alternative collateral mechanisms have been developed to overcome the collateral problem. The most widely used is the joint-liability system or group lending.

Micro-finance loans are used for productive purposes such as small enterprises. However, in Nicaragua different organizations manage micro-finance for housing projects. This research tries to find out whether or not joint-liability in combination with micro-lending for housing in Nicaragua is a useful guarantee system. Therefore, executives of the main microcredit organizations in Nicaragua were interviewed.

Micro-lending for housing can be divided in small loans for home improvement and somewhat larger loans for new housing construction. With respect to the small loans, the assumptions in theory seem to be in line with practice. Still, representatives of these organizations in Nicaragua claim that joint-liability does not work. They do use co-signer systems. Such a system can be seen as a specific type of joint-liability system. Although the exact reason is not clear, it is possible that the sheer simplicity of co-signing makes it useful in Nicaragua while at the same time joint-liability systems are too complicated for implementation. With respect to the construction loans, joint-liability cannot be used; the size of the loans impede that a viable joint-liability contract can be constructed.



# Conclusions and recommendations

## Conclusions

Micro-finance for housing organizations in Nicaragua use co-signer systems for loans for home improvement. They, however, prefer to use collateral. This implies that co-signing is used when informational problems cannot be solved in a different way because of a lack of available collateral. According to the theory, they thus use co-signing to take advantage of the fact that peer monitoring costs are lower than monitoring costs of the lending organization. According to proposition 1 this will only be possible if the group, consistent of a borrower and a co-signer, has close social ties. Only then, peer monitoring costs will be lower and the group-members will be able to cooperate. Co-signers that are related to the projects of the organizations that were selected in Nicaragua are, without exception, friends or relatives. This fact suggests that proposition 1; ‘the borrowers in a successful joint-liability group have close social ties’, is true.<sup>1</sup>

On the other hand, all organizations claim that joint-liability is not viable. The reason why, contrary to co-signing, joint-liability would not be viable, is not immediately clear. In theory, the main difference between co-signing and joint-liability lies in the tightness of the constraints. In the case of co-signing, the participation and the limited liability constraints are less tight for the borrower when compared to the constraints of the borrowers in a joint-liability system. This means that the constraints of one group-member, the borrower, are more easily satisfied in a co-signer system. The fact that the viability of co-signing is mainly bounded by the constraints of one group-member, the co-signer, instead of two, can suggest that organizations in Nicaragua choose co-signer systems because it is easier to form groups that will function in the proper way.

For larger loans for housing construction, all organizations use collateral in the form of mortgage. One reason to do this is that collateral is available, so that formational problems can be solved. The main reason not to use joint-liability is that group-members will not be able to pay for a defaulting partner. This means that the size of these loans imply that it is too difficult to satisfy the limited liability constraint. Proposition 2; ‘for loans with a size above \$ 1500, joint-liability will not be viable’, is true.

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<sup>1</sup> Also, the fact that all organizations rely heavily on references from the neighbourhood during the screening process indicates that the peers have private information about the potential borrower.

## Recommendations

To set up a new microfinance of housing initiative in San Carlos or elsewhere in Nicaragua one should recognize that:

1. Joint-liability or group lending does not work in Nicaragua and is therefore hardly used.
2. Co-signing is widely used and accepted.

This is not easy to explain. Co-signing is less complicated and easier to organize.

Intuitively it seems logical that it is therefore less likely to fail. Especially when little knowledge and practice is available regarding such schemes.

3. Close social ties between the borrower and the co-signer are essential in order to reduce the default risk.
4. Joint-liability is not suited for relatively large loans, such as for entire housing units. Co-signing maybe more suited.<sup>2</sup>
5. Be sure that borrowers are aware of their repayment obligations. They tend to regard foreign money as subsidies because that is the way it always was.

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<sup>2</sup> The organization Nijmegen-Masaya constructed new housing units and used, among other things, co-signing. Repayment is not going smoothly.

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Melchior Bauer



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## Chapter 1 Introduction

The World Bank estimated that 1.2 billion people live of less than one Dollar a day and 2.8 billion have a daily income of less than two Dollars a day. The fact that this number has been increasing for some decades suggests that up till now we have not been able to alleviate poverty in the long run. Many reasons can be thought of when explaining the failure to reduce poverty. One, often cited reason, is that development aid in the form of donations does not stimulate productivity. This explains why poverty may only be reduced in the short run while in the long run the productivity does not rise and might even decrease.

Therefore, since roughly two decades ago, the attention has been shifting to another form of development aid that tries to stimulate productivity. It is called micro-finance. This is a general term for all practices of lending to poor people. Most of the poor are not able to borrow, or only at exorbitantly high interest rates from informal moneylenders, because they have no collateral to pledge. These people, however, often have profitable investment opportunities. It is estimated that some 500 million poor manage small businesses (Ledgerwood, 2000). Microfinance institutions try to service these poor. They use small short-term loans in order to reduce the risk of default. To overcome the collateral problem some alternative collateral mechanisms have been developed. The most widely used is the joint-liability system, which was made famous in the late 1980s by the Grameen Bank in Bangladesh. This system is also called group lending. The system consists of borrowers forming groups in which all members are liable for all loans. Most groups consist of more or less five members and if one defaults, the others will have to repay the loan that has been defaulted. No collateral is used.

Motivated by the alleged successes of such systems, these types of projects have been implemented all over the world and some micro-lenders have even started lending to non-productive investment projects, such as housing. However, a lively debate has risen between economists about the effectiveness of joint-liability mechanisms. While it is probably useful in some circumstances, these might be very limited.

### § 1.1 The research

At the instigation of ‘The Stedenband Groningen- San Carlos’, a Dutch Non Governmental Organization (NGO), an investigation was undertaken into micro-finance for housing in Nicaragua, from March till May 2002. The primary goal of ‘The Stedenband Groningen-San Carlos’ is to start projects in San Carlos and its surroundings that contribute to the social and economical development of this area. At the moment of this research ‘The Stedenband’ explored in cooperation with Housing Association ‘Nijestee’ the possibilities to start a housing project for the poor. Therefore, it asked the Science Shop of Economics,

Management & Organization, in Groningen to examine existing housing finance projects in Nicaragua, in order to determine what the general practices are in this type of lending activity. Also the problems justifying the use of certain guarantee systems had to be examined. Two students of the University of Groningen, Melchior Bauer (Economics) and Lisa Staal (Management and Organizations) carried out the research. In 2002, during the spring, they visited Nicaragua to analyse the behaviour of various Nicaraguan microcredit organizations. They interviewed executives of the micro credit organizations CEPAD, HABITAT, ACODEP, CEPRODEL and AFODENIC, to discuss the main characteristics of their loan products; their main objectives; the extent to which the programs achieved the main objectives; and how they dealt with screening, monitoring and enforcement. This report is drafted by Melchior Bauer. Lisa Staal's research has been reported in a different study commissioned by the Science Shop of Economics (see the publications list of the Science Shop in the back of this Report). Lisa Staal focused on how credit organizations that offer microfinance of housing programs to the low- and moderate-income households in Nicaragua have organized and structured their lending practice to deal with the issues of screening, monitoring and enforcement (the main determinants of the costs of lending). Melchior Bauer focused more in depth on, in the light of the discussion mentioned above, the guarantee systems used. More specifically, his research question was:

*Is joint-liability a useful guarantee system in combination with micro-lending for housing in Nicaragua?*

The fact that the loans are used for housing makes this question even more interesting, since most theories about joint-liability are based on micro-finance loans for productive purposes such as small enterprises.

## **§ 1.2 Outline of the chapters**

The presented conclusions and recommendations are derived from a comparison between expectations concerning joint-liability based on the theory and the practice of micro-financing for housing in Nicaragua. Chapter two and three handle the theory and chapter four the practice. Chapter two explains the general theory of joint-liability.<sup>3</sup> Based on the assumptions concerning joint-liability Chapter 3 formulates some expectations about the use of joint-liability based on the theory and theoretical examinations as have been presented in chapter two. Chapter four examines the practice of micro-finance institutions for housing in Nicaragua and the guarantee systems used. Finally, the last chapter provides a summary of the main issues of the research.

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<sup>3</sup> The reader interested in a technical explanation can contact the Science Shop for a copy of the thesis of Melchior Bauer.

## Chapter 2 Joint liability

### § 2.1 Introduction

Joint liability lending refers to the practice where lenders ask their borrowers to form groups, in which each member of a group besides her own loan is liable for her partner's loans as well, so that if one's partner defaults the borrower will have to pay an amount on top of her own repayment. The level of joint liability refers to the size of this payment. The term joint-liability lending, also known as group lending, is often associated with the practice of micro-finance. Although the scientific interest in the mechanism of joint-liability lending grew with the rise of micro-finance, basic joint-liability lending existed as early as in the 1850s in Germany (Ghatak and Guinnane, 1999:212)<sup>4</sup>. As a consequence the working of joint-liability systems can be analysed independently from micro-credit projects.

However, in order to find out what the basic properties of a joint-liability scheme are, it is useful to analyse how micro-finance practitioners try to solve default problems by joint-liability schemes. In the theoretical literature two main goals of joint-liability schemes are described. The first is to solve the problem of asymmetric information and the second is to solve the problem that the lender can not confiscate a collateral in case of default. The latter objective will be examined in section 2.2. Section 2.1 presents a model that shows how joint liability lending could reach the first goal. Section 2.3 describes a specific type of joint-liability lending, a co-signer system. A co-signer system is different from other joint-liability systems in the sense that the liability works one way. A borrower is liable for her partner, but the partner is not liable for her borrower. In Nicaragua, as will be described later on, co-signer systems are often preferred to joint-liability. This preference may be induced by the distinct characteristic, described above, that makes a co-signer system in some cases more effective than joint-liability. In order to find a possible rationale for using a co-signer system, this type of joint-liability will be given some extra attention. The last subsection will contain some concluding remarks.

### § 2.1 Asymmetric information

Asymmetric information is information that is available to one party of a contract but not the other. Between a lender and a borrower asymmetric information will always exist. Asymmetric information can influence the terms of the contract. For example, a borrower who initiates a project that has a high probability of failure will also have a high probability of

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<sup>4</sup> The German credit cooperatives actually used a distinct type of joint-liability that is called 'co-signing'. This type of lending will be given more attention later on.

default and so will have to pay a high interest rate to the lender. This type of information is often known to the borrower but unknown to the lender. Only borrowers with low probability of default are willing to share this information with the lender. High risk borrower will try to present themselves as low risk borrowers. In the end the lender cannot expect borrowers to be honest.

Commercial banks have two solutions to these problems. First, they can investigate the borrowers to ascertain which are low risk and which are high risk borrowers. This however is costly and independent from the loan size. When granting large loans, the return on the loan is large and so might outweigh the costs of the investigation. For small loans, such as micro-finance loans, these costs will almost certainly be too large. Therefore, this solution is not an option with respect to micro-finance.

Second, the lender can demand a certain amount of collateral. This collateral will be seized when the borrower defaults. Low risk borrowers default less often and so lose their collateral less often. Therefore, they are prepared to accept a larger amount of collateral. In short, the amount of collateral accepted by the borrower contains information about the risky ness of the borrower. However, because borrowers who are granted micro-finance loans are relatively poor, they often do not have any available collateral. Therefore this solution is not possible with respect to micro-finance either.

The asymmetrical information problem can be divided into three individual problems:

- the risk of adverse selection,
- moral hazard,
- costly state verification.

In short, adverse selection refers to the fact that the lender does not know the risk profile of a borrower before he grants the loan. As a result the lender doesn't know what the chances are that the borrower will default. Moral hazard refers to the fact that a borrower is inclined to make less effort to earn money than is expected from her, because she rather spends her time in a more pleasant way. Lastly, costly state verification means that a borrower rather announces that she is not able to repay a loan instead of repaying even if the borrower is actually able to repay. That way she keeps the most earnings to herself.

When borrowers do have this information about each other but the lender does not, joint-liability lending can offer a solution by making the borrowers responsible for each other so that they will monitor each other and the lender will not have to incur monitoring costs. This section first describes the general framework of joint-liability, before it analyses the problems related to adverse selection, moral hazard and costly state verification.

### **§ 2.1.1 Assumptions of the model of joint-liability**

The main assumption of the model is that borrowers have information about each other that the lender does not have. More specifically borrowers can observe three things about other borrowers for free:

1. each others risk profile,
2. the level of effort another borrower dedicates to her project,
3. the actual return of the project. Most micro-finance literature assumes that a loan is used for productive purposes. Such an investment generates a return out of which the loan can be repaid. Although a housing loan does not have to generate a return, this does not affect the general working of micro-finance schemes.

The lender could solve these three informational asymmetries by the use of joint-liability contracts.

Some other less essential assumptions are made. For example, the returns of the borrowers are assumed to be uncorrelated. This precludes certain type of behaviour and simplifies the discussion. In general, however, it might be expected that joint-liability works best when returns are negatively related. This will be discussed later on. Next, the lenders are assumed to break even on their loans; they do not make any profit. This is a reasonable assumption since all the organizations in the survey are non-profit organizations. Finally, borrowers are assumed to have no wealth. This is also a reasonable assumption since the borrowers are relatively poor.

### **§ 2.1.2 Adverse selection**

Adverse selection refers to the fact that borrowers are not willing to reveal their risk type. A low risk borrower defaults less often than a high-risk borrower. Therefore the lender can demand a lower interest rate and still break even because the loan is often repaid. The high-risk borrower will claim to be low risk as well in order to obtain the low risk interest rate. If the lender believes them all she will not break even because more borrowers than expected will default because of the hidden high risks. To overcome this the lender has to demand a higher interest rate from all borrowers. High risk, or 'risky', borrowers then pay less interest than they actually should be paying and low risk, or 'safe' borrowers pay more. The consequence can be that due to the higher interest rate the projects of safe borrowers are no longer viable, so they will not accept the loan. Only risky borrowers accept the loan. This is called adverse selection. The negative characteristics of adverse selection are that viable projects are not undertaken (the safe ones) and that the repayment rate is lower (only risky projects with more defaults are undertaken) than is a situation without adverse selection.

A joint-liability system can solve the adverse selection problem and thus increase the repayment rate. Two types of joint-liability contracts can be constructed; one pooling contract or a menu of separating contracts. A pooling contract consists of one contract accepted by all

borrowers, including the safe borrowers. The menu of different separating contracts is constructed in a way that each borrower, i.e., the safe borrower and the risky borrower, individually chose the contracts that are constructed for them personally. This option only works when borrowers form groups with identical borrowers, or, in other words, all groups are made up by the same risk type borrowers. Otherwise, it is not possible to identify the different risk types by the choice of contract. Forming groups by type is called assortative matching. Theory learns us that borrowers will indeed form homogenous groups. However, in practice it turns out that the evidence is not clear on this topic.

To construct a contract that would secure enough repayment to the lender and at the same time be accepted by the safe and risky borrowers, it has to fulfil four constraints:

1. The participation constraint secures that borrowers will accept the loan contract. The expected returns less the expected interest payments to the lender have to be larger than her's next best alternative, *i.e.* the opportunity costs of labour. The borrower will not accept the loan, when she can earn more by not lending, but, by, for example, working in the field.
2. The break-even constraint of the lender. The lender must earn enough return to cover the costs. Repayment rate and interest rates define this constraint.
3. The incentive compatibility constraint. The borrower must choose the contract that is designed for her. This is accomplished by varying the sizes of interest payment and joint-liability payment when a group member defaults. Safe borrowers have safe group members so they will have to pay less often for defaulting group members and therefore accept larger amounts of joint-liability in their contract. On the other hand safe borrowers more often have to pay their own interest so they are willing to accept smaller interest payments than risky borrowers.
4. The limited liability constraint. The borrower must always be able to repay the sum that she is expected to pay. The largest sum possible is her own interest payment plus the interest payment for the partner(s) in the group. She will only have to pay this when she is successful and the rest of her group is not. So this constraint states that the return of the investment when successful has to be at least as large as all the interest payments of the group.

Only when all these constraints are met, a joint-liability contract (either pooling or separating) is possible: the safe borrowers will come back into the market and the repayment rate will increase. Important feature is that the borrowers screen and select themselves, so that the lender does not have to do this.

### § 2.1.3 Moral hazard

Moral hazard refers to the fact that the lender cannot observe the effort levels of the borrowers. After the contract is signed and the loan is granted a borrower has an incentive to choose a lower effort to make the project successful than before the contract was signed. The reason is that the positive pay-off of a low effort level or in other words the utility the borrower derives from doing something else, goes entirely to the borrower. The negative pay-off of a low effort level is the increased probability of failure of the project. This negative pay-off partly goes to the lender. This distortion in the incentive mechanism leads to a sub-optimal effort level of the borrower and a decrease in the repayment rate.

A joint-liability contract can solve this problem when borrowers:

1. can costless observe the effort of their partners,
2. have an adequate sanctioning mechanism,
3. have an incentive to take remedial action when a partner misuses her loan.

The first assumption represents the information asymmetry that joint-liability tries to exploit. The second assumption secures that borrowers can force each other to stick to their promises and enables cooperation between borrowers. As will be shown further on, cooperation is essential for joint-liability to work. The third condition stems from the fact that a borrower is partly liable for her partner and therefore has an incentive to minimize the partner's probability of default.

The crucial point is that borrowers decide jointly on what effort level to put into their projects. The idea is that the borrower knows that when she chooses a low effort level, the partners in the group react by choosing also a low effort level. This is more or less the 'If I am going to have to pay for you, you are going to pay for me' mentality. At the other hand, when a borrower chooses a high level the others also choose a high level, because in the end the jointly chosen high effort level generates the most return. This works only when borrowers promise to maintain the high level and not divert to the low level. To commit the borrowers to their promise a penalty on secretly choosing the low effort level is necessary. This penalty is present in the form of a social penalty system, that the borrowers are assumed to have.

When joint-liability solves the moral hazard problem the repayment rate increases. Again important is that the lender does not have to incur monitoring costs because borrowers, who are more equipped to do so, monitor each other.

### § 2.1.4 Costly state verification

Costly state verification refers to the fact that borrowers can increase their return by defaulting even when they can repay. Joint-liability can alleviate this problem when borrowers: can costless observe the effort of their partners, have an adequate sanctioning mechanism and have an incentive to take remedial action when a partner misuses his loan.

These are the same assumptions as applied to the solution of moral hazard problem and the rationale is identical as well. Essential is that borrowers tell the truth about their return. This requisite is hardest to fulfil when the partner of the borrower defaults. In that case it would be more rewarding to default instead of repay because the borrower has to pay two times less interest, instead of, one time. Therefore, the lender has to demotivate this behaviour of double defaulting or, all group members defaulting. This can be realised by making clear to the borrowers that in case of a double default it is very likely that all borrowers will be investigated and that penalties might be given in case of bad behaviour. Although this policy is costly, it increases the repayment rate because borrowers will more often repay the loan. The reason is that a defaulting borrower will receive help from her group members and so the loan will be repaid. This would not be the case without joint-liability.

## **§ 2.2 Joint-liability as collateral substitute**

Because most of the poor lack collaterals, the lender compensates this by increasing the interest rate. The result could be that the borrower does not accept the loan, or in other words: the borrower's participation constraint is no longer satisfied.

A second problem is that even when the lender knows that the borrower is able to repay, he has no way to force repayment. In addition, legal actions against a defaulting borrower are only worthwhile in a country where an efficient legal system is in place. Several poor countries do not have such a system, so that legal actions are time and money consuming, or not even viable.

Joint-liability transfers the enforcement incentive to the borrowers who have a superior sanctioning mechanism compared to the lender. Moreover, joint-liability increases the repayment rate because successful partners of the defaulting borrower compensate the loss of return to the lender. To accomplish this, the returns of the two borrowers have to compensate each other. This means that the more negatively correlated the returns are, the better the joint-liability system will work.

## **§ 2.3 Co-signer systems**

A co-signer is a person that guarantees for a borrower. Most important difference between such a system and joint-liability is that the liability works only one way; the other borrower is not liable for the co-signer. Other differences or similarities between joint-liability and co-signing depend on the assumptions made concerning the co-signer system. When the co-signer, for example, does not borrow, the co-signer system works in a completely different way than a joint-liability system. In this report, the co-signer system is seen as a particular type of joint-liability system. Therefore, the assumption is made that borrowers form groups

of two members, so the co-signer is borrower as well. When this is not the case, a whole new theoretical framework has to be constructed.

In the theoretical model co-signing the problem of credit rationing has to be solved. This is a different problem than the problems related to asymmetric information. However, the goal of a co-signer system, resembles the goal of a joint-liability system. The goal is to expand credit to the borrowers, while assuring that they will stick to the project the lender wants them to stick on: the project with the highest probability of success.

The main assumptions of the model of co-signer schemes are the same as in case of asymmetrical information. Thus, the most important assumption is that the borrower and co-signer can costless observe each other, while the lender cannot. When granting loans to individual borrowers the borrowers will choose high-risk project while the lender wants them to choose low risk projects. This problem can be solved by introducing co-signership. One borrower will have to guarantee for the other. Obviously, the co-signer must have an incentive to co-sign for someone else. The incentive is a lower interest rate caused by an increase of the repayment rate due to the assurance that in case the borrower defaults, the co-signer will repay the loan. It can be shown that the co-signer payments in case of default by the borrower are off set by the reduction in the interest rate.

Co-signer contracts have to satisfy the same constraints as in the case of joint-liability contracts: 1. the participation constraint secures that borrowers will accept the loan contract, 2. the break-even constraint of the lender, 3. the incentive compatibility constraint and 4. the limited liability constraint. The main difference with joint-liability is that the first and fourth constraints have only to be met by the co-signer. In other words, in case of co-signing, these constraints are easier to be satisfied by the borrower, because the borrower will not have to make any joint-liability or co-signer payment. This can imply that a well functioning co-signer system is easier to implement.

## **§ 2.4 Concluding remarks**

Joint-liability lending can alleviate informational problems when lending to the poor. Implementing a joint-liability system, however, can be a complex undertaking. Borrowers must, for example, be given the opportunity to select their group-members in such a way that the peer monitoring costs indeed will be low enough for joint-liability to be viable. This means that all group-members must know or get to know each other well. The Credit with Education lending program in Burkina Faso, for example, used a too simplistic set-up for their joint-liability project. Program officials formed the groups, while the borrowers never met before the loan was granted. This project did not survive. Borrowers can select their partners by arranging meetings and explaining the loan process. This, however, can be time and money consuming, especially as groups get bigger. Seen in this perspective, co-signer systems can be seen as simple joint-liability systems, because it involves only two persons

and the borrower does not have to make any joint-liability or co-signer payment. Such a system can be introduced in order to exploit the existence of asymmetric information, when implementing a joint-liability system is too difficult.

## **Chapter 3 Propositions about the viability of joint-liability in practice derived from the assumptions**

### **§ 3.1 Introduction**

The previous chapter showed that joint-liability (including co-signing) can alleviate problems that would frustrate lending to relatively poor borrowers when executed on an individual basis. The effectiveness of joint-liability, however, depends on some assumptions made concerning the real world. This chapter tries to find out how these assumptions are most likely to be met in practice. In order to do so propositions about the real world derived from the most important assumptions will be analysed:

- 1 peer monitoring costs are zero, or at least significantly lower than monitoring costs,
- 2 borrowers can cooperate,
- 3 the participation constraint and the limited liability constraint are met.

These assumptions are crucial, because if one of them is not satisfied, joint-liability will not be viable. Other assumptions influence the efficiency of a joint-liability system, but do not have to be essential to its success or failure, like the assumption that ‘the returns of the borrowers are uncorrelated’. The success of a joint-liability scheme depends on how often borrowers within a group are able to pay for defaulting partners. The frequency in which this state of the world occurs depends on the correlation of the returns of the borrowers. When the returns are positively correlated, they move in line with each other. If one borrower has a bad return, the other borrower is likely to have a bad return as well, so it is not likely that the other borrower will be able to repay for the defaulting borrower. Perfectly negative correlation means that the returns move in the opposite direction. This means that when one borrower has a low return, the other has a high return with certainty. Diversification of the group, therefore, increases the repayment rate. However, when returns are correlated in some way and the borrowers themselves know this, they can reduce their exposure to fluctuations in return by choosing partners with which they are negatively correlated. The fact that borrowers in that case will not only select on risk type but also on correlation complicates the selection process and can impede that all groups are formed by the same type of borrowers. In other words, this could prevent assortative matching from occurring. In general, so long as assortative matching occurs, joint-liability’s effectiveness increases with negative correlation and decreases with positive correlation. Thus, the absence of zero correlation in practice does not have to frustrate a joint-liability system.

Other assumptions such as ‘the borrowers have no initial wealth and therefore no available collateral’ imply that individual lending is not possible, so lenders have to use systems such as joint-liability. However, if borrowers do have initial wealth, joint-liability can still be viable,

while individual lending is also possible. It could even be argued that the presence of initial wealth can secure the possibility of joint-liability. This will be explained in the next section.

### **§ 3.1 The propositions**

The first assumption describes the characteristic of the borrower group that joint-liability seeks to exploit. In general, a lender will incur monitoring costs. This is the case because borrowers have private information that they are reluctant to share, but that the lender needs. In other words, the costs related to informational asymmetries described in the previous section are always present when lending. Often these costs are low enough in order to allow lending on an individual basis to be viable. When lending small loans in poor environments these costs could rise up to a point where individual lending is no longer viable. Joint-liability can now be useful because it shifts the monitoring costs from the lender to the borrowers. This will only improve the viability of lending when the monitoring costs amongst borrowers, or the peer monitoring costs, are lower than the monitoring costs for the lender. Peer monitoring costs are low in case borrowers already have information about each other or can easily obtain this information. This is likely to be the case when borrowers know each other well.

The second assumption makes sure that the joint-liability influences the behaviour of the borrowers. Through the joint-liability payment, the return of a borrower depends on the behaviour of the partner, because if the partner decides to default, the borrower will have to pay for her as well. This interdependence must induce borrowers to jointly decide how much effort they will dedicate to their projects and if they will repay. So they maximize joint total return instead of individual returns. In general, this secures that informational problems will be alleviated because by jointly maximizing returns, borrowers are not able to increase expected return by doing less or not repaying and passing the costs to the partner in the form of the joint-liability payment. Jointly maximizing expected return is a way of cooperating, because borrowers cooperate to agree about the effort and repayment level. Borrowers must be able to commit to such agreements because otherwise these agreements are worthless. Therefore, it is necessary to have social sanctions that secures non violation of the agreement. A borrower can inflict social sanctions on her partner when this partner breaks a promise. When the disutility of such a sanction is high enough, the borrower can be sure that the partner keeps her promise. The availability and height of such sanctions depends on the social ties between a borrower and a partner, hence the term 'social sanctions'. When borrowers have influence on each other, effective social sanctions are most likely to be present. For example, ignoring a close friend will have a much greater impact than ignoring a far acquaintance.

The above analysis about the first two assumptions leads to the first proposition about joint-liability in practice:

(1) The borrowers in a successful joint-liability group have close social ties.

The last assumption describes the conditions that secure the construction of a joint-liability contract that will work in the way in which it is intended to. These conditions are translated into the participation and the limited liability constraint.

The participation constraint states that the expected pay-off for the borrower has to be higher than the opportunity cost of labour. In other words, the borrower expects to earn more by undertaking a project for which she will have to take a loan, instead of undertaking a project for which she does not need a loan. When this is not the case, the borrower will not accept the loan. The most important variable is the opportunity cost of labour. This constraint is most likely to be satisfied when the opportunity cost of labour are low, which implies that borrowers have no economically interesting opportunities to dedicate their unit of labour to without a loan. However, joint-liability schemes are constructed to solve the adverse selection problem. This suggests that borrowers in joint-liability schemes often are not willing to borrow on an individual basis, while they have viable investment opportunities. In this case the individual borrowing participation constraint for safe borrowers is not met.<sup>5</sup> Or in other words, the borrowers prefer not to take a loan and undertake a project for which they do not need a loan. This is more likely to happen when the opportunity costs of labour are relatively high.

Summing up, the opportunity cost of labour has to be such that individual lending is not attractive while joint-liability lending is. The combination of a satisfied joint-liability participation constraint with a non-satisfied individual participation constraint suggests that the opportunity cost of labour has a lower and an upper limit. To simplify the analysis it is useful to assess which of these two limits matters the most. It is assumed that the most important condition is that joint-liability participation constraint is satisfied so that joint-liability lending is possible. This seems logical: if the other constraint, the individual participation constraint, is satisfied then this might implicate that joint-liability is not optimal because individual lending is possible. However, even though individual lending is possible, joint-liability is possible as well. Therefore this is a less urgent condition. The above indicates that the joint-liability constraint is the crucial constraint and so the upper limit for the opportunity cost of labour is important. This analysis says nothing about which type of lending is more efficient when both individual and joint-liability lending are possible.

In general, joint-liability is likely to be successful when borrowers are targeted that have little other possibilities to dedicate their work effort to.

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<sup>5</sup> The individual borrowing participation constraint is the same constraint as the participation constraint but in the case of a conventional individual loan.

The other constraint is the limited liability constraint. This constraint secures that borrowers will always be able to repay the amount they owe to the lender. The largest amount the borrower might have to pay occurs when the partner defaults, than she will have to pay the interest rate and the joint-liability payment. The size of this payment depends on the size of the joint-liability payment. Most of the time the joint-liability payment is a percentage of the interest payment. The size of the interest payment increases with loan size and so the joint-liability payment can be expected to increase with loan size as well. In case of larger loans the limited liability constraint will be more difficult to satisfy. In this report the normal loan size with respect to joint-liability will be considered to be the loan size used by established institutions that use joint-liability schemes. This loan size varies. For example, the Grameen Bank has an average loan balance of \$134, while the Banco-Sol has a relatively high balance of \$909 (Morduch, 1999). Loans up to \$1500 are assumed to be of normal size. The following proposition represents the relationship between loan size and the limited liability constraint:

(2) For loans with a size above \$ 1500, joint-liability will not be viable.

When borrowers have initial wealth, they do not have to pay interest and the joint-liability payment solely out of the proceeds of their project. Therefore, in general, when borrowers possess initial wealth, the limited liability constraint is more likely to be satisfied.

### **§ 3.2 Concluding remarks**

The effectiveness of joint-liability depends on the extent to which the assumptions of zero peer monitoring costs, cooperation between borrowers and the fulfilling of the participation and the limited liability constraint are met in practice. The assumptions of no correlation between the returns of the borrowers and that borrowers have no initial wealth influence the effectiveness of joint-liability in practice, but are not of crucial importance.

The assumptions of zero peer monitoring costs and cooperation leads to the proposition that in practice borrowers in a successful joint-liability group must have close social ties. The constraint that secures that borrowers will always be able to repay the amount they owe to the lender and that the expected pay-off for the borrower has to be higher than the opportunity cost of labour leads to the proposition that in practice for loans with a size above \$1500, joint-liability will not be viable.

## Chapter 4 Micro-finance for housing in Nicaragua

### § 4.1 Introduction

This chapter examines the performance of micro financial institutions for housing in Nicaragua. It starts with a brief history of Nicaragua, followed by a description of the housing problem in Nicaragua. Section 4.3 describes the features of the examined micro-finance institutions. How these institutions are examined is pointed out in section 4.3. The general findings will be briefly outlined in section 4.4. Finally, section 4.5 deals more specifically with the used guarantee system of these institutions.

### § 4.2 A brief history

A civil war that covered the entire eighties, combined with an American trade embargo and falling world prices for Nicaragua's exports, plunged Nicaragua into extreme poverty. In 1989 peace was installed and Violeta Barrios Chamorra was elected president. Since then, economic growth slowly started increasing although unemployment remained high. In the next election the liberal Arnoldo Aléman was elected president. In the fall of 1998 hurricane Mitch caused a hard blow to the economy. However, the economy recovered fast in the next year and in 1999 the economic growth reached 7%, inflation was brought under 8% and unemployment decreased to around 11%. Since then, the economic situation has been deteriorating. The main causes were a banking crisis and the extremely corrupt nature of Aléman's government, consisting of friends and family of Aléman that considered Nicaragua as their private property. In 2001, Enrique Bolaños was elected president. He made ruling out corruption his main agenda point and seems to take this task seriously. In the spring of 2002, Aléman was found guilty in a corruption case, but his impunity as ex-president keeps him out of jail. At this moment Nicaragua is one of the poorest countries in Central America. In 2001, GDP was 2.6 billion, total external debt 7.1 billion, the unemployment rate 23%, while inflation remained constant at 7.4%. Half of the population lives in poverty and the distribution of income is very uneven; the highest percentile income group is consuming 48.8% of the total consumption, while the lowest percentile consumes 0.7%. At this moment Nicaragua depends on aid and participates in the debt relief programme for Highly Indebted Poor Countries. However, thanks to macroeconomic stabilisation and privatisation, economic growth is expected to increase.

There was and is a large demand for housing in Nicaragua under the poor. A large part of them live in self constructed houses that are very unhygienic. These people lack the funds to improve their housing conditions because commercial banks do not grant them loans.<sup>6</sup> Major

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<sup>6</sup> The smallest mortgage loan is around 15000 USD.

credit for housing projects undertaken by the government failed because of low repayment rates. After hurricane Mitch, which destroyed thousands of homes, this problem became especially apparent. Since then micro-finance institutions started initiating housing for the poor projects. At this moment, the government recognizes that micro-finance is a better solution to the housing problem than the large-scale state run projects of before. This vision represents itself in the new approach of the Banco de la Vivienda, the state owned national housing bank. They shift their funds and effort from originating projects themselves to supporting successful housing projects.

## § 4.2 The organizations

The goal of the research was to gain knowledge about micro-finance for housing in Nicaragua through the examination of existing projects. The Stedenband Groningen-San Carlos was interested in all types of housing micro-finance. Therefore, when selecting a group of micro-financial institutions (MFI), the only criterion was that they had experience with micro-credit for housing. Two types of housing loans exist: for the improvement of houses or for the construction of new houses. Since the Stedenband Groningen-San Carlos did not yet know which type of loan they were going to focus on, both loan types were investigated.

The organizations in Nicaragua that have experience with micro-finance for housing can be divided into two groups. The first group consists of small organizations with a local focus. They do not manage large funds and they rely heavily on their personal ties with the borrowers for their projects to be successful. They only grant small loans. Numerous organizations of this type are present in Nicaragua. Because of their ties with the borrowers some are inclined not to punish defaulting borrowers.<sup>7</sup> In general, they deal with not repaying borrowers in an ad hoc fashion. So the solution can be different every time. The other group consists of larger organizations that have extensive experience with micro-finance in general and that manage housing projects that cover a larger area than just the city in which the organization is situated. They grant loans for home improvement as well as for new housing construction. These organizations more emphasize the guarantee system than the small organizations because the informational problems are more apparent. Because of the larger size of their projects they have less information about the borrowers.

For this research the second group of organizations was chosen because the size of their projects secures that an official framework will have to be constructed in order to solve informational problems. Solving problems ad hoc would be too costly. Also the working of the contracts for large loans for construction is especially interesting. These loans are often seen as micro-finance, but are very distinct in one aspect: their size.

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<sup>7</sup> An example is Habitar in Managua that has constructed a guarantee system that states that borrowers have to pledge a collateral. However, this collateral is only used in order to generate pressure. In the end the collateral is never seized.

This second group consists of a limited amount of organizations. We were able to locate seven such organizations in Nicaragua. They are Ceprodel, CEPAD, ACODEP, Confia, HABITAT for Humanity Nicaragua, AFODENIC and El Fondo por el Desarrollo Local (FDL). The first four are situated in Managua and manage projects of finance for home improvement as well as for construction. HABITAT is situated in Managua as well but only implements projects of housing construction. AFODENIC is situated in Juigalpa, in the centre of Nicaragua, and is engaged in both types of finance. FDL is situated in Managua. FDL was about to start a project involving credit for the construction of new housing.

All organizations are Non Governmental Organizations (NGOs), except for Confia. Confia is a financial institution and is therefore the only one that has to meet banking rules. All organizations have comparable mission statements. In general, they want to help to overcome poverty. Their specific goal with respect to housing projects is to improve the living standard of the poor. Operational independence means that an organizations can cover it's costs that are related to their activities, such as salaries. All organizations have reached operational independence, except HABITAT. The reason for this is that HABITAT is the only organization that doesn't demand interest payments. Their decision not to demand an interest is based on the biblical principle that forbids Christians to bank: "If you lend money to my people, to the poor, you shall not extract interest from them."<sup>8</sup> None of these organizations has reached financial independence. This means that all these organizations use, at least partially, donated funds. A large part of these funds are distributed by foreign organizations. Confia, for example, receives funds from the Dutch organization 'Stichting Staatsloterij'. The cost of capital for these organizations is lower than would be the case if they were to attract all their funds on the financial markets.<sup>9</sup> These organizations set interest rates in such a way that, 'the costs are being covered, while at the same time not neglecting that their customers are poor and therefore are not capable to pay all interest rates', as a representative of CEPAD put it. The fact that these organizations are subsidized is reflected in their cost of capital. Their zero-profit constraints are easier to satisfy than would be the case without donations. In general, it can be concluded that these organizations break even on their loan projects, while keeping in mind that this might be made possible through the low costs of capital that they face.

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<sup>8</sup> Exodus (22:25)

<sup>9</sup> Gangopadhyay and Lensink (2001) offer an explanation for the existence of these donor subsidies. The bank expects to get  $r$  for a successful borrower and  $c$  for a not successful borrower. Only, the theory indicates that  $c$  has to be bigger than  $r$  for the bank to break even. The borrowing partners are better off pretending that they both were successful and pay  $2r$  instead of paying  $r$  and  $c$ . The bank will receive more  $r$  than expected and less  $c$  and the bank will not break even. This is a logical explanation for the fact that a lot of micro-finance lenders still need subsidies. Even if the break even point should be met on theoretical grounds. It is supposed that a joint-liability pooling contract is used for a group of two identical borrowers.

### **§ 4.3 The methodology**

Interviews were held with representatives of six organizations; one representative of each organization. It was not possible to organize a meeting with a representative of FDL. The first part of these interviews dealt with the quantitative aspects of the loan process, such as, the interest rate and loan sizes. In the second part, questions were asked about the screening, monitoring and enforcement. These topics were captured in questions about the selection criteria, the way these organizations try to stimulate good behaviour and the guarantee system. Also a question about the reasons for default was embodied in the interviews. Because the questions were open, the answers are not uniform. Appendix A1 contains a summary of all the interviews.

Besides the interviews, all organizations were sent a questionnaire to establish what kind of guarantee system works best with respect to this type of loan and why. This questionnaire contained questions concerning the large loans for housing construction. The reason to held a questionnaire was that it is easier to quantify the reasons that induce the organizations to choose a certain type of guarantee system than in case of an interview. The four organizations that responded are AFODENIC, Ceprodel, CEPAD and FDL. Although in May 2002, FDL did not had a loan project for construction running, they had their design ready. Therefore, they only answered the qualitative questions. The questionnaires are bundled in Appendix A2.

### **§ 4.4 The general findings**

All organizations calculate the interest rates over the loan balance in US Dollar terms. This means that the payments are adjusted for the devaluation of the Nicaraguan Cordoba against the US Dollar. In the last years devaluation has been 6% against the US Dollar while inflation has been 8%. So, roughly speaking, the payments are adjusted for inflation.

Table 1 shows that the interest rates range from 6% to 17%. The law has set the maximum rate that NGO's can demand from their borrowers equal to the average rate that commercial banks demand of clients (excluding credit card accounts). In March 2002, this rate was 17.6%. In addition, the table shows that loan term ranges from a maximum of three years for improvement loans to three to ten years for construction and that the loan size varies for home improvement loans from \$200 to \$1500.

*Table 1 General information micro-finance for housing institutes in Nicaragua (2002)*

	Ceprodel	CEPAD	ACODEP	Confia	HABITAT	AFODENIC
constitution date	1990	1972	1990	2000	1992	1998
type of organization	NGO	NGO	NGO	Financial Institution	NGO	NGO
grade of independence	Operational	Operational	Operational	Operational	None	Operational
type of loans	improvement/ Construction	Improvement / Construction	Improvement/ Construction	Improvement/ Construction	Construction	Improvement/ Construction
repayment rate	97%	N.A.,	97%	98%	90%	95%
interest rate	12%	12%	17.6%	N.A.	0%	6%
loan size (in \$)*	200 – 500	500-1500	500-750	Average 735	2700-3000	600
loan term*	Max 3 years	Max 3 years	2-4 years	Average 2.5 years	10 years	6 years
Required guarantee*	Collateral or co-signer	Co-signer	Collateral and co-signer	Collateral or co-signer	Mortgage or co-signer	Collateral or co-signer

\*Except for HABITAT, the answers are related to improvement loans

*Source: interviews.*

Table 2 provides information concerning construction loans of the institutions. The size varies from \$1500 to \$5000.

*Table 2 Information of construction loans (2002)*

	AFODENIC	Ceprodel	CEPAD
average loan size	1500	5000	2000
average loan term	6	7	3
guarantee	mortgage	mortgage	mortgage

*Source: questionnaires.*

All organizations state that a borrower is able to spend around 20% of his monthly income for housing. In general organizations use this rule when fixing the loan size. The loans have a fixed repayment term and schedule, so that when a borrower's income is known, the loan size can be established. Only Ceprodel adjusts the loan term rather than the size to the repayment capacity of the borrower. For small loans most organizations only demand that borrowers have a stable income.

Besides the income criterion, most organizations depend heavily on references from the neighbourhood or from a local committee during the screening process. Some use criteria

such as minimum length of residency requirements, but none of these are widely used. Ceprodel uses a minimum length of residency criterion in order to secure that enough information about the potential borrower is available in the community, while CEPAD uses such a criterion in order to reduce the risk that a borrower will move during the loan process. None uses gender as a criterion, although CEPAD and Confia acknowledge that women are more reliable borrowers. The other organizations however refute the suggestion that women are more reliable borrowers.

All organizations maintain a level of communication with a group of representatives from the neighbourhood. This way they try to gain insight in what the needs and problems amongst the borrowers are and try to solve these problems. This, as a representative of ACODEP noted, also gives the borrowers the feeling that they are involved in the decision making process with respect to the loan policy. Also, problems with individual borrowers can be discussed with people who have inside information about the reason for non-payment. These people are the representatives.

The possibility to obtain new finance when the first loan is repaid is an accepted way to stimulate the borrowers to repay. Ceprodel even disburses their larger loans in steps. Confia and AFODENIC reward good repayment behaviour with vouchers and scholarships. Some organizations point to the fact that an important factor in repayment stimulation is the social pressure stemming from the knowledge that neighbours are aware of the fact that a borrower does not repay. Only one organization announces actively the names of not-repaying borrowers. Most organizations state that this knowledge is automatically spread in tight communities.

All organizations claim that the majority of the cases of non-repayment are the result of loss of income of the borrower. The problem is not a lack of motivation to repay. This implies that the loan contract functions in a way that the lenders consider correct.

## **§ 4.5 The guarantee systems used for the different loans**

Loans can be divided into home improvement and home construction loans. The former are loans with sizes up to 1500 USD and the latter are loans ranging from 1500 up to 5000 USD. For home improvement loans most organizations require a collateral or a co-signer. The co-signer is an alternative, in case collateral is not available. According to a representative of AFODENIC, a mortgage guarantee is not an option, because “the value of such a guarantee is much bigger than the loan that has to be guaranteed”. It is not clear, if the co-signer also takes on a loan. In general, the co-signer is a relative or a friend of the borrower. Not one of the organizations use a joint-liability system.<sup>10</sup> ACODEP and AFODENIC claim that Nicaraguans

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<sup>10</sup> Only Ceprodel incidentally has had community groups that were willing to guarantee for a borrower in the case of a small loan.

are too individualistic for such a system. They are not willing to guarantee for other borrowers. Confia points to the fact that groups are too difficult to form and that groups are too heterogeneous.

For home construction loans all organizations require a mortgage as guarantee. Only HABITAT allows a co-signer to pledge his house as collateral. As seen in Table 3, two organizations indicated that an important reason not to use a joint-liability system is the fact that a collateral is available in the form of the new house. The other two do not take the option of a joint-liability system into consideration at all.

*Table 3 Most important reasons to require a mortgage guarantee*

	AFODENIC	Ceprodel	CEPAD	FDL
A mortgage is the only collateral with sufficient value	5*	5	4	4
Joint-liability is not necessary because another guarantee exists (namely a mortgage)	n.a.	4	5	1
Joint-liability is not possible because the payments would be too large	n.a.	2	5	4
The borrowers do not like joint-liability systems	5	5	4	5

\*1=not important, 2, 3, 4, 5=very important

*Source: Questionnaires*

HABITAT explains why they dislike the use of the house as guarantee: “seen from the point of view that our goal is to provide proper housing, it is never productive to claim the house in case of default”. Although this quote represents a general sentiment, HABITAT is the only organization that goes on never to take legal actions against defaulting borrowers.

The other reason not to use a joint-liability system is that the payments would be too large, according to the organization. The reason is that these loans are relatively large, and therefore, the interest rate and joint-liability payments are also relatively large, so that the group-members will not be able to pay for a defaulting member and at the same time pay their own interest rate as well.

## § 4.6 Summary

The investigated larger micro finance organizations with extensive experience with micro-finance of housing projects provide all finance for home improvement and construction, except for Habitat. The loan size varies for home improvement loans from \$200 to \$1500 and for construction from \$1500 to \$5000. The loan size is based on the rule that a borrower is able to spend around 20% of his monthly income for housing. The loan term ranges from a

maximum of three years for improvement loans to three to ten years for construction. The interest rates range from 6% to 17%.

For home improvement loans most organizations require a collateral or a cosigner and for home construction loans they all require a mortgage as guarantee. Joint liability is not an option for the institutions, because Nicaraguans are too individualistic and it is too difficult to form groups. In case of home construction loans joint liability is not necessary, because a collateral is available and the payments are too large if a member defaults.

All the examined organizations reached operational independence, except for HABITAT. None of them reached financial independence.

## Chapter 5 Summary

Joint-liability seeks to solve problems of asymmetric information. The core of such problems is that borrowers have private information about some factors that influence the repayment rate, such as the probability that they will default. Because a lender does not have this information, it is often in the best interest of the borrower to misrepresent this information in order to increase her pay-off. A borrower with a high probability of default for example, will have to pay a lower interest rate if she can convince the lender that she has a low probability of default. Obviously, the lender would like to know the truth. This problem can be solved in two ways. First, the lender can obtain the information by monitoring the borrowers. This is possible when the monitoring costs are not too high relative to the return of the loan. Second, the lender can demand collateral when granting a loan. The amount of collateral that borrowers accept contains information that would have been private and also secures that the incentives of borrower and lender move more in line.

In certain circumstances these two solutions are not at hand. Micro-finance or, small loans to relative poor, faces such circumstances. Because loans are small it is very possible that the monitoring costs are not compensated by the return of the loan, so that monitoring borrowers is not an option. The borrowers are poor which implies that they often do not have collateral available. Now joint-liability could solve the informational problems. By obliging borrowers to form groups and making the group-members liable for each other, a lender can pass the incentive to monitor to the borrowers. This will only be useful if monitoring costs among the borrowers or, the peer monitoring costs, are significantly lower than normal monitoring costs. Therefore, the following is an important assumption in the joint-liability theory; ‘peer monitoring costs are zero’. Besides this assumption, the working of joint-liability depends on some other assumptions. Two of them are, together with the assumption described above, crucial to the success or failure of joint-liability schemes; ‘the borrowers can cooperate and the participation and limited liability constraints are satisfied’. The fact that borrowers can cooperate secures that they can effectively monitor each other. Low monitoring costs and a high probability of cooperation are most likely to be present if group-members have close social ties. The participation constraint secures that borrowers will accept the loan and the limited liability constraint secures that the borrowers will always be able to repay. The last constraint is most likely to be met when the loans are small.

The research was done into micro-finance for housing in Nicaragua. In the light of the theory about joint-liability, the focus was on the guarantee systems used in combination with these loans. Micro-finance for housing in Nicaragua can be divided into loans for home improvement and loans for new housing construction. Improvement loans have a size comparable to mainstream micro-finance loans while the construction loans are bigger. The

small loans are distributed in combination with a co-signer system. A co-signer system is a specific type of joint-liability system in which only one group-member is liable for the other. In general, the systems work in the same way. With respect to the lending activity in Nicaragua, the co-signer and the borrower are always friends or relatives. In other words, they have close social ties. This indicates that the organizations indeed take advantage of lower peer monitoring costs by introducing a co-signer system. All organizations however indicated that joint-liability systems do not work in Nicaragua. The reason why co-signer systems would work while joint-liability would not work is not exactly clear. It is likely that the simplicity of co-signing compared to joint-liability motivates the preference that these organizations have for co-signing.

When distributing construction loans, all organizations demand a mortgage guarantee. An important reason to do so is the fact that collateral is available in the form of the new housing unit. Through the use of this collateral as guarantee, informational problems can be solved without the use of joint-liability. On the other hand, joint-liability will not be viable because these loans are too large. Because of the size of the loans borrowers should be able to pay an amount if a partner defaults that is too large for the population that microfinance institutions in Nicaragua try to help. It is not possible to construct a contract that satisfies the limited liability constraint.

## Literature

### Articles

- Aghion, B. Armendariz, 1999. On the design of a credit agreement with peer monitoring. *Journal of Development Economics* 60, 79-104
- Akerlof, G., 1970. The market for lemons: quality uncertainty and the market mechanism. *Quarterly Journal of Economics* 84 (3), 488-500
- Bester, H., 1985. Screening vs. rationing in credit markets with imperfect information. *American Economic Review* 75 (4), 850-855
- Besley, T., S. Coate, 1995. Group lending, repayment incentives and social collateral. *Journal of Development Economics* 46 (1), 1-18
- Gangopadhyah, S., R. Lensink, 2001. Joint liability lending:a note. Research Report Rijksuniversiteit Groningen
- Gangopadhyah, S., R. Lensink, 2003. The Relevance of Co-signing in a Simple Asymmetric Information Model. Research Report Rijksuniversiteit Groningen
- Ghatak, M., T. Guinnane, 1999. The economics of lending with joint liability: theory and practice. *Journal of Development Economics* 60, 195-228
- Ghatak, M. 2000. Screening by the company you keep: Joint liability lending and the peer selection effect. *The Economic Journal* 110, 601-631
- Morduch, J., 1999. The microfinance promise. *Journal of Economic Literature* 37 (4), 1569-1614
- Rothschild, M., J. Stiglitz, 1976. Equilibrium in Competitive Insurance Markets: An Essay on the Economics of Imperfect Information. *The Quarterly Journal of Economics* 90 (4), 629-649
- Stiglitz, J., 1990. Peer monitoring and credit markets. *World Bank Economic Review* 4 (3), 351-366

### Books

- Fudenberg, D., J. Tirole, *Game Theory* ( Cambridge, 1991)
- Hulme, D., P. Mosley, *Finance Against Poverty* (London, 1996)
- Macho-Stadler, I., D. Perez-Castrillo, *An Introduction to the Economics of Information* (Oxford, 1997)
- Nicholson, W., *Microeconomic Theory, Basic Principles and Extensions* (Orlando, 1998)

### Internet

- [www.worldbank.com](http://www.worldbank.com)



## Appendices

### A1 General interviews about micro-finance for housing projects

- 1 Name  
**Ceprodel**
- 2 Constitution date  
1990
- 3 Type of organization  
NGO
- 4 Mission  
'Contribute, in co-operation with the population, to the alleviation of poverty through the development of credit programs and the development of local projects.
- 5 For what are the loans used?  
Improvement and construction of housing
- 6 What is the repayment rate?  
97%

The following questions deal with improvement loans

- 7 What is the loan size?  
For improvement: 200-500 USD
- 8 What is the loan term?  
Max 36 months for home improvement. The term depends on the repayment capacity of the borrower.
- 9 What is the interest rate?  
12% yearly over the loan balance in Dollar terms. There are no differential rates.
- 10 What percentage of monthly income can a client pay for housing?  
A household can pay 20% of it's income for housing.
- 11 What are the requirements to be accepted for a loan?  
The most important selection criterion are the references of people from the same neighborhood. In this way it is checked if the borrower is responsible. Therefore a borrower must have been living in the area for at least a year. If this is not the case, than not enough information can be acquired. All the information is checked through interviews. Sex and education are no criteria. There must be a source of income and the borrowers must have an Identity Card.
- 12 What guarantee system do you use?  
Either a collateral of sufficient value (125% of the value of the loan), or a co-signer if a collateral is not available. For these small loans using a mortgage is too expensive and

takes to much time. The co-signer is either a friend or family and must have an income, at least as large as the borrower's income.

13 Why don't you use a joint-liability system?

N.A.

14 In what other ways do you try to stimulate repayment?

The borrowers are divided in groups. Local committees represent these groups. These committees can represent the neighbourhood to the outside world and the leaders are very important because they know the members of the neighbourhood and have influence on them. Sporadically, groups have paid for defaulting members. This has only happened with loans below 100 USD.

The loan is paid in steps. If the first part is not repaid in time, then the following part is not distributed.

15 What is the most important reason for clients not to repay?

Loss of income. There is no difference between the repayment rate of man and women.

16 What happens if a loan is not repaid?

First the borrower is visited and then he receives a letter. In a mean time the co-signer is stimulated to generate pressure on the borrower as well. After the letter official steps will be taken and either the co-signer will have to repay or the collateral is being confiscated. If the reason for non-repayment is loss of income, the loan is restructured.

17 Do clients have problems understanding the loan process?

No.

18 Are there other lenders in the neighbourhood?

Informal lenders. They have been known to demand interest rates of 20% monthly.

1 Name

**ACODEP**

2 Constitution date

1990

3 Type of organization

NGO

4 Mission

Improve housing, embody the women in productive activities, and help develop the enterprise and economic capacity of the clients

5 For what are the loans used?

Improvement and construction of housing.

6 What is the repayment rate?

97%

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The following questions we deal with the loans for improvement

7 What is the loan size?

500-750 USD

8 What is the loan term?

2-4 years

9 What is the interest rate?

17.63% yearly over the loan balance in Dollar terms. There are no differential rates.

10 What percentage of monthly income can a client pay for housing?

20% of their income

11 What are the requirements to be accepted for a loan?

The most important requirement is a stable income. Further more references from other borrowers are important. Although sex is not a criterion, 75% of the borrowers are woman. Women however are not better borrowers

12 What guarantee system do you use?

A collateral of enough value (200% of the value of the loan) and a co-signer. The co-signer can be a relative or friend and must have an income sufficient in order to repay the loan.

13 Why don't you use a joint-liability system?

Nicaraguans are too individualistic for joint-liability lending. Such a system will not work in Nicaragua.

14 In what other ways do you try to stimulate repayment?

If borrowers repay their loan on time, they are given the possibility to take a new loan. Also the neighbourhood knows if one of it's members doesn't repay. This is the case because one visit of ACODEP is always noticed. The social pressure that the neighbourhood generates is a very important factor in stimulating the borrower to repay.

15 What is the most important reason for clients not to repay?

First of all, unforeseen factors. Second loss of income or illness. Third because clients are not willing to repay. There is no difference in repayment rates between man and women.

16 What happens if a loan is not repaid?

First a letter is sent to the borrower. Next a letter is sent to the co-signer, stating that if the borrower doesn't repay, he will have to pay. The co-signer will pressure the borrower. Then legal steps are taken. If the borrower cannot repay because of loss of income, then the loan is restructured.

17 Do clients have problems understanding the loan process?

No.

18 Are there other lenders in the neighbourhood?

Informal lenders. They charge rates monthly equivalent on the yearly rates of ACODEP.

1 Name

**HABITAT**

2 Constitution date

1992

3 Type of organization

NGO

4 Mission

Like an expression of Christian love, we develop communities with the Nicaraguan families by self-construction of basic secure houses.

5 For what are the loans used?

Construction

6 What is the repayment rate?

90%

7 What is the loan size?

2700-3000 USD

8 What is the loan term?

10 years.

9 What is the interest rate?

0

10 What percentage of monthly income can a client pay for housing?

20% of their income

11 What are the requirements to be accepted for a loan?

A stable income. The minimum income requirement varies per sector. The average minimum monthly income of the borrowers is 145 USD. The maximum is 290 USD. They are not allowed to have any other properties of value besides the land and the borrower needs to have a family. This to make sure that the most needy get the loans. Women are no better borrowers.

12 What guarantee system do you use?

The collateral is the land title. If a borrower does not have the land title, a co-signer with a land title is required. This land title will then be the collateral. Most co-signers are relatives. These are the best co-signers because they are close to the borrower.

13 Why don't you use a joint-liability system?

It doesn't work.

14 In what other ways do you try to stimulate repayment?

The borrowers choose representatives. Habitat meets with them 3 to 4 times a year. In these meetings all problems can be talked about. Also, if borrowers have an excellent repayment record, after repaying 50% of the loan, they can obtain extra funds.

15 What is the most important reason for clients not to repay?

In more than 50% of the cases of non-repayment, the loss of income is the problem.

16 What happens if a loan is not repaid?

First the leaders of the community will visit the borrower. Then his name is announced in the neighbourhood. The social pressure that is generated by these steps needs to be sufficient. After that the loan will be restructured. In the end the collateral is never seized nor are co-signers forced to repay the loan.

17 Do clients have problems understanding the loan process?

No

1 Name

**CEPAD**

2 Constitution date

1972

3 Type of organization

NGO

4 Mission

Help develop the communities, the housing conditions and the economic capacity of the clients.

5 For what are the loans used?

Improvement and construction

6 What is the repayment rate?

N.A.

The following questions will deal with loans for improvement

7 What is the loan size?

500-1500

8 What is the loan term?

Max 3 years

9 What is the interest rate?

12% yearly over the loan balance in Dollar terms.

10 What percentage of monthly income can a client pay for housing?

15%-20%

11 What are the requirements to be accepted for a loan?

A minimum monthly income of 110 USD and a maximum income of 220 USD. A local committee checks what his income is and interviews neighbours to verify the borrowers behaviour. The borrower has to be living in the same place for at least 5 years. This lowers the change the borrower will move during the loan process. The borrower or a family member has to literate. At least 30% of the loans have to be disbursed to women, because women do more often repay.

12 What guarantee system do you use?

A co-signer. He is not allowed to be family because often the incomes of family members are correlated. His income has to be at least twice as large as the income of the borrower.

13 Why don't you use a joint-liability system?

First of all because in such a system the good clients are punished and second because the clients do not like such a system.

14 In what other ways do you try to stimulate repayment?

Meetings are arranged with the neighbourhood in order to discuss problems and needs. Sporadically second loans are being granted.

15 What is the most important reason for clients not to repay?

Economic circumstances.

16 What happens if a loan is not repaid?

First the borrower is contacted. Then the co-signer and finally legal steps are taken.

17 Do clients have problems understanding the loan process?

No

18 Are there other lenders in the neighbourhood?

Other credit organizations.

1 Name

**AFODENIC**

2 Constitution date

1998

3 Type of organization

NGO

4 Mission

Give answer to the need for housing in Juigalpa.

5 For what are the loans used?

Construction of new housing

6 What is the repayment rate?

95%

The following questions will deal with loans for home improvement

7 What is the loan size?

Average is 600 USD

8 What is the loan term?

6 years fixed. The monthly payment depends on the loan size. The loan size depends on the borrower's income.

9 What is the interest rate?

6% yearly over the loan balance in Dollar terms.

10 What percentage of monthly income can a client pay for housing?

Maximum is 25%

11 What are the requirements to be accepted for a loan?

Stable income. Interviews are held with neighbours. AFODENIC lends to borrowers who have already borrowed small loans from AFODENIC. That way they are sure that the clients are reliable.

12 What guarantee system do you use?

A collateral with sufficient value. If the borrower doesn't have collateral a co-signer can be used. This co-signer will have to meet the same collateral requirement.

13 Why don't you use a joint-liability system?

The Nicaraguan culture is not the right one for group lending. People only want to be responsible for their own actions.

14 In what other ways do you try to stimulate repayment?

Reunions are organized every 6 months. In this reunions AFODENIC tries to organize the neighbourhood in a committee with representatives. Through these representatives effective communication is being facilitated. Also the representatives can collect the payments, which simplifies the payment process. Organizing a community in such a way is easier in the country. Also it is known in the community which borrower doesn't repay. This knowledge is spread automatically in tight communities. When a loan is repaid in time, borrowers have access to new loans and have the possibility to be granted scholarships.

15 What is the most important reason for clients not to repay?

Spending money on other things such as liquor. The majority of these cases involve male borrowers.

16 What happens if a loan is not repaid?

Three letters are sent. The over due payment has to be repaid in 3 months. If this doesn't happen legal steps will be taken.

17 Do clients have problems understanding the loan process?

No.

18 Are there other lenders in the neighbourhood?

Different types of lenders and organizations. Their interest rates vary from 10 to 15% monthly.

1 Name

**Confia**

2 Constitution date

2000

3 Type of organization

Financial Institution

4 Mission

Close the gap between the demand and the supply of credit for micro-enterprises and housing. Strengthen our leader position in this market segment.

5 For what are the loans used?

Improvement and construction of new housing

6 What is the repayment rate?

98%

The following questions deal with loans for improvement

7 What is the loan size?

Average size is 735 USD

8 What is the loan term?

Average 2.5 years

9 What is the interest rate?

N.A.

10 What percentage of monthly income can a client pay for housing?

N.A.

11 What are the requirements to be accepted for a loan?

A minimum monthly income of 50 USD. Sex is no criterion although women are more reliable borrowers. 68% of the borrowers is female.

12 What guarantee system do you use?

Collateral or a co-signer.

13 Why don't you use a joint-liability system?

The clients don't like it, thanks to the experiences they have had with such systems. Also it is difficult to form the groups because the borrowers are heterogeneous.

14 In what other ways do you try to stimulate repayment?

Borrowers are rewarded vouchers and access to new loans if they repay in time.

## A2 Questionnaires about finance for construction of new housing

	AFODENIC	CEPRODEL
1. When did the project start:	1998	1998
2. The statistics are based on which year	1998-2001	1998-2001
3. How much are distributed	30	165
4. The loan is for:		
a) Construction of houses	x	
b) Construction of houses and the purchase of terrain		x
5. What is the average size of the loans (in USD)	1500	5000
6. What is the average term (in years)	6	7
7. Your clients live in		
a) rural	x	
b) urban		
c) both areas		x
8. Is this project operationally independent (do the incomes cover the operational costs)	yes	yes
9. Is this project financially independent (does it function without donations)	no	no
10. What is the percentage of loans in arrears:	11%	3%
11. After how many non payments is a loan recorded as such	1	3
12. What is the percentage of loans at risk:	N.A.	7%
13. After how many payments is a loan recorded as such	3	6
14. What is the average income of your clients (in USD)	154	200
15. What percentage of the clients is female	30%	65%
16. What percentage of the loans in arrears was lent to clients	2%	50%
17. What is the required guarantee	mortgage	mortgage

Answer the following questions by using this scale:

0=not true, 1=not important, 2, 3, 4, 5=very important,  
6= don't know.

18. What are the most important reasons to use a mortgage:		
a) It's the only guarantee that has sufficient value	5	5
b) It's a legal requirement	5	
c) Other		

19. What are the most important reasons not to use

a joint-liability system

- |  |   |   |
|--|---|---|
| a) The clients do not like it                          | 5 | 5 |
| b) The size of the payments is too large.              |   |   |
| Other group members cannot pay if one defaults         |   | 2 |
| c) The fact that the good clients are punished         |   | 3 |
| d) Forming the groups costs too much                   |   | 2 |
| e) It's not necessary because another guarantee exists |   | 4 |
| f) Other   |   |   |

20. What are the main reasons for the client to repay

- |  |   |   |
|--|---|---|
| a) The knowledge that they can lose their collateral | 5 | 5 |
| b) The knowledge that other can borrow if they repay | 3 | 4 |
| c) The will have access to a new loan if they repay  | 4 | 4 |
| d) The social pressure forces them to repay          | 1 | 3 |

	<b>CEPAD</b>	<b>FDL</b>
1 When did the project start:	2001	
2 The statistics are based on which year	2001	
3 How much are distributed	137	
4 The loan is for:		
c) construction of houses	x	
d) construction of houses and the purchase of terrain		
5 What is the average size of the loans (in USD)	2000	
6 What is the average term (in years)	3	
7 Your clients live in		
d) rural		
e) urban		
f) both areas	x	
8 Is this project operationally independent (do the incomes cover the operational costs)	yes	
9 Is this project financially independent (does it function without donations)	no	
10 What is the percentage of loans in arrears:	N.A.	
11 After how many non payments is a loan recorded as such	1	
12 What is the percentage of loans at risk:	N.A.	
13 After how many non payments is a loan recorded as such the loan term		
14 What is the average income of your clients (in USD)	163	
15 What percentage of the clients is female	36%	

- 16 What percentage of the loans in arrears was lent to clients 50%
- 17 What is the required guarantee mortgage

Answer the following questions by using this scale:

0=not true, 1=not important, 2, 3, 4, 5=very important,  
6= don't know.

- 18 What are the most important reasons to use a mortgage:
- |  |   |   |
|--|---|---|
| d) It's the only guarantee that has sufficient value | 4 | 4 |
| e) It's a legal requirement                          | 4 | 2 |
| f) Other   |   |   |
- 19 What are the most important reasons not to use a joint-liability system
- |  |   |   |
|--|---|---|
| g) The clients do not like it                          | 4 | 5 |
| h) The size of the payments is too large.              |   |   |
| Other group members cannot pay if one defaults         | 5 | 4 |
| i) The fact that the good clients are punished         | 5 | 5 |
| j) Forming the groups costs too much                   | 3 | 1 |
| k) It's not necessary because another guarantee exists | 5 | 1 |
| l) Other   |   |   |
- 20 What are the main reasons for the client to repay
- |  |   |   |
|--|---|---|
| e) The knowledge that they can lose their collateral | 5 | 5 |
| f) The knowledge that other can borrow if they repay | 3 | 1 |
| g) The will have access to a new loan if they repay  | 4 | 3 |
| h) The social pressure forces them to repay          | 1 | 2 |



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**Publicaties<sup>11</sup> van de Wetenschapswinkel Economie & Bedrijfskunde**

- EC 96 E. Beumers, *Beslissende (f)actoren voor hennep teelt, onderzoek naar het achterwege blijven van hennep teelt voor de papierindustrie in de Veenkoloniën*, 1997.
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- EC 110 A.P. Postma, drs. F.J. Sijtsma, drs. T.M. Stelder en drs. D. Strijker, *De concurrentiekracht van Weststellingwerf, een economisch-ruimtelijk perspectief*, 1999.
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- EC 133 Auke Jan Martens, Paul van der Laan, Elise Kamphuis (red.), *Goed gekeurd hout. Hoe kan het marktaandeel van gecertificeerd hout worden vergroot?*, 2003.
- EC 134 Catrinus J. Jepma, Elise Kamphuis (eds.), *Developing Countries and GATS*, 2003.
- EC 135 Friso de Jong, *Telecommunications reform in Mexico. An in-depth analysis on the socio-economic consequences of liberalisation of Mexico's telecom services industry*, 2003

#### Werkdocumenten

- WD 2000-1 drs. Frans J. Sijtsma, Prof. dr. P.H. Pellenbarg en drs. K.G. Lugtenborg, *Naar een goed besluit over vier Friese musea*, 2000.
- WD 2000-2 drs. Elise Kamphuis (red.), *Komt EKO van de grond?*, *De verwerkingscapaciteit van biologische producten in Noord Nederland*, 2000.
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- WD 2002-1 drs. F.J. Sijtsma, M. Broekhof, Prof. dr. J. van Dijk, drs. G.J. Hoogstra, *IKO en PRIKK: Stimulans voor economische activiteit op het Fries-Groningse platteland? Een*

- evaluerend onderzoek naar de IKO en PRIKK regelingen voor investeringen van het kleinbedrijf, 2002.*
- WD 2002-2 drs. F.J. Sijtsma, drs. P. Hogendoorn, drs. G. J. Hoogstra, drs. C.-J. Pen, prof. dr. P.H. Pellenbarg m.m.v. Sytse Duiverman, *Bijlagenrapport bij Uitgifte van bedrijventerreinen op het Friese platteland, 2002.*
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- WD 2002-4 Renate Bieleman, Leon Boerboom, Michiel Nijboer, Jacob de Vries, drs. Frans J. Sijtsma (redactie), *Maatschappelijk Verantwoord Ondernemen in Fryslân, Samenvatting, 2002.*
- WD 2002-5 drs. Frans J. Sijtsma, prof. dr. P.H. Pellenbarg, *Concurrentie-analyse Europark Coevorden, 2002.*
- WD 2003-3 drs. Frans J. Sijtsma, *Economische gevolgen van de PKB Waddenzee in de Kop van Noord-Holland. Een beoordeling van het ECORYS-NEI rapport, 2003.*