

**A MODEL OF SUSTAINABILITY FOR MICROCREDIT
FINANCIAL INSTITUTIONS**
with application to some MFIs in Catalonia

GLÒRIA ESTAPE DUBREUIL

gloria.estape@uab.es

CONSOL TORREGUITART MIRADA

consol.torreguitart@uab.es

Departament d'Economia de l'Empresa
Universitat Autònoma de Barcelona
Emprius, 2 – 08201 Sabadell (Barcelona) – Spain

April 2005 (*)

Abstract

In this paper, we examine the management of an NGO whose essential aim is to facilitate micro-credits to the poor in a developed country. By means of several variables (institutional and variable costs, amount of annual donations, amount directed to micro-credits, rate of repayment, etc.), we establish a model of such an NGO and use it to study its sustainability.

We then apply the model to the description of three different organizations that have been operating in Catalonia (Spain) for at least the last ten years, and discuss the appropriateness of the general results obtained beforehand.

Keywords

Micro-finance; model and sustainability; Catalonia

(*) This paper is an output from a research project funded by the Universitat Autònoma de Barcelona, PNL2004-13

1. Introduction

This paper concerns micro-credits (i.e, small loans given to poor people without collateral, often used to start micro enterprises or for self-employment) and especially MFIs or Micro-Finance Institutions, micro-credit organizations that develop such initiatives or social credit programs.

The idea of micro-credit, which appeared in the late 1970s, was originally related to facilitating economic development within third world countries in a more efficient way, transforming subsidies and donations into loans (in principle to at least partially be returned). The system could therefore be seen as a method of achieving the direct implication of individuals and groups in the improvement of their own future, while helping social and economical development at the same time. Of these initiatives, the *Grameen Bank* of Bangladesh is usually quoted as a pioneer. It was set up in 1976, and at present has more than two million customers, almost 1000 offices, and provides an average monthly credit volume of over 20 million dollars (Evers, 2001).

The number of microcredit program clients in developing countries can be counted in millions¹. The organizations sustaining these programs are NGOs, governments, private groups, and Financial Institutions aimed at micro-entrepreneurs. Its practices, despite having different goals (see for example Smith, 2002), and despite the differing characteristics of the social groups they have as their main targets, have more in common with the traditions of the banking sector than with the more customary “humanitarian aid sector”.

One of the practices that have probably attracted the most attention (especially from the theorists), due to its innovative nature, is the fact that many programs only make group-loans. In the case of the *Grameen Bank*, one of the main representatives of this methodology, together with *BancoSol* in Bolivia, (Mosley, 2001), the groups are formed in a voluntary way and always have five members. The groups have to meet regularly

¹ For example, in the 2002 report by the Microcredit Summit (Daley-Harris, 2002) we find data to certify the world-wide scope of microcredit initiatives. Until October 2002, data was reported from 3,204 Institutions in 133 countries, adding up to almost 55 million real customers, of which more than 21 million were women from the poorest segment of the population (the lower half of the population living below the clear-cut poverty line in their country).

with each other and with other groups, in compulsory meetings organized by the institution. In all of these programs, which do not require collateral, loans are granted to individuals, but its members are made jointly responsible for the return of the loans granted to its members. According to these rules, if one of the members of the group ever defaults, any future loan is denied to all of its components.

Another characteristic that almost always differentiates microfinance contracts from those made in traditional banking is the fact that many Institutions give loans in a progressive way, starting with small amounts, offered together with a system of return (fixed *ex ante* or agreed on in accordance with the customer, but very often on a weekly basis) that allows the user to increase the size of posterior loans, should they repay the previous one in due time. The existence of reiterated contacts, plus the credible threat of terminating the relationship if repayment is not made (thus not having future access to loans), allows Micro-Finance Institutions to overcome informational problems related to the assessment of borrower's reliability, and to improve the efficiency of the system, either in individual or group lending (Morduch, 1999a).

As a matter of fact, the most important feature to be taken into account when considering microfinance is its dynamism, putting forward alternative mechanisms that use different forms of "social capital" when material collateral is scarce. In general, the microcredit system has been capable, and often sufficiently efficient, to deal with customers in poor environments, offering loans (and often also managing savings) of small amounts, so that social credit has in the last fifteen years become one of the most popular development strategies (Anderson and Locker, 2002).

There are, however, remarkable differences between programs, and one worth mentioning here is the interest rate charged on loans. In some cases, it is fixed by the institution below the level that would provide financial sustainability. An example here again seems to be the *Grameen Bank*, where it is considered that increasing interest rates to attain sustainability would undermine the social mission of the bank (Khandker, 1998, quoted in Morduch, 1999a). And despite the reporting of high repayment rates (around 98% until 1995), it has been argued that it would be difficult for the Bank to pursue its social mission should it not be substantially subsidized (Morduch, 1999b).

In other programs, however, the financial sustainability of the Institution is considered a priority. *BancoSol* in Bolivia, for example, established as an NGO and transformed into bank in 1992, five years afterwards, or the governmental *Bank Raykat* in Indonesia (Patten et al., 2001), offer comparatively high interest rates (although below the market rates in the corresponding country). The prospect of attaining financial sustainability is also the core of other micro-credit programs, which by now have far less scope than those mentioned above. This is the case with the network of *Village Banks* pioneered in the mid 1980s by an NGO called FINCA in South America. Its foundation is an NGO acting as a sponsor for the Bank, making an initial loan to a group of neighbours of a given village that has previously agreed on the constitution and management of the bank in an independent way. The idea is that the initial loan would be given back to the NGO when the Bank has attained self-sustainability (Morduch, 1999a).

Even though the vast majority of MFI can be located in the third world, towards the end of the 1980s microfinance started to be considered a tool to alleviate poverty and facilitate development not only in poor countries but also in the poor areas of rich countries, where regular Financial Institutions do not offer financial services to the individuals or groups that can not provide collateral to guarantee a loan, even though the characteristics of the business initiative proposed may be worthy. One of the countries where microcredit programs have had the greatest impact has been the United States, where, according to Schreiner and Woller (2003), there are more than 340 active programs offering microcredit services. There have also been initiatives in Europe, and a report issued by the *Enterprise Directorate General* of the European Commission in late 2003 mentioned governmental programs (on a national or regional level), as well as others managed by several NGOs, in almost all countries of the European Union.

Besides some obvious differences between microcredit borrowers in developed countries and those living in the third world (and being poor does not necessarily mean the same in both situations), there are also differences between the behaviour of MFIs and the needs of the organizations in both cases.

For example, over the last few years it has been argued that it is far easier for an NGO in a developed country (or at least in Spain) to raise funds to be used far away in the third world, than to obtain subsidies or donations to help people in poor neighbourhoods

of the country itself. Nevertheless, the ample social web existing in Catalonia, with a large tradition of associations and organizations involved in social matters, enables the existence of a certain number of NGOs that are “specialized” in offering financial aid through what are now most commonly known as microcredit programs. But social initiatives carried out without governmental funds are frequently at some kind of risk. Therefore, one of the main (self) addressed questions asked to organizations seeking to continue in the field is how they can ensure their sustainability. This paper aims to make a contribution to answering that dilemma by using a model to study different scenarios in which so-called sustainability could remain possible.

Our aim is to study the premises under which we can analyse the procedures of the Institutions of the so called social economy that have decided on micro-funding as a program. We shall take into account the fact that each institution has its own operating system, which will be contingent for its own goals. Therefore, we propose a model designed to aggregate the operative system of any given Micro-Financial Institution within a group: those which are not profit-driven, because they are funded or operated by NGOs. And afterwards, depending on the basic variables identified, we will seek to explain how the Institution can operate best, contingent to its goals and operative restrictions.

With this purpose in mind, we have structured the present work into the following sections: in the second, we present a model designed to study the behavior of a non-profit driven MFI which intends to maximize its contribution to the economic development and alleviation of poverty, subject to a zero profit constraint. We then use the model to study how this procedure can be adjusted to changes in the main parameters used to describe the MFI, which are in turn related to the basic strategies envisaged to attain (or maintain) its financial sustainability.

In the third section, we present three MFIs operating in Catalonia, highlighting their characteristics and peculiarities, in order to be able to analyze, in the fourth section, how the behaviour of each institution can be explained in the light of the designed model. In the last section, we present some primary conclusions concerning the strategies available to the MFI depending on its objectives and work dynamic.

2. The model

In this section we will put forward and study a simple model for the behaviour of an NGO facilitating micro-credits, thus acting as a Micro-credit Financial Institution, or MFI. Being an NGO, its aim should not be related directly to profit, but to the best possible use of its fundsway (in accordance with its own social purposes), i.e, to enhance its social target, helping to produce as much wealth as possible through the businesses settled or improved by the micro-credits lent by the MFI.

Like Godquin (2004), we would consider the general aim of such an MFI to be the maximization of the global net expected return from its borrowers, under a zero profit condition. But to formalize this idea, the main variable we will use will be the number of loans made by the MFI in a given temporal horizon. It has to be a suitable variable under a certain number of hypotheses, which are mainly established to keep the model simpler. First, we will assume that the amounts lent by the MFI are all of a similar size (which will be set as the unit) and that the MFI has a single credit product, with all borrowers facing the same conditions (uniform interest rate, i , and equal duration)². We shall also assume that the MFI only deals with individual borrowers³, and that there are no moral hazard problems involved in the process, i.e, a business-project presented to the MFI by a would-be borrower is accepted only if there is a “fair” probability of success.

The aim of the MFI can then be modelled using a utility function $\phi(N,L)$, where N is the number of borrowers accepted by the MFI, and L the total amount of labour used both to assess the entrepreneurs’ projects and to accompany them until the end of the loan period, while they are considered “clients” of the MFI. As is to be expected, we will assume a twice continuously differentiable function ϕ that is increasing in both N and L , and such that the attractiveness of the increases is diminishing (therefore ϕ is concave with respect to any of the variables considered alone). Furthermore, we shall assume

² The assumption is derived from the observations made in the MFIs described in the following section.

³ ‘Individual borrowers’ means that the Institution does not use group lending, binding the concession of credit to the previous repayment of their loans by other members of the same group. Nevertheless, this is only a clarifying hypothesis, since it will only influence the repayment performance of the borrowers, a characteristic which is considered a parameter within our model.

that the more projects are accepted the more attractive higher levels of labour will be.

Specifically, we will suppose that $\frac{\partial \phi}{\partial N} > 0$, $\frac{\partial \phi}{\partial L} > 0$, $\frac{\partial^2 \phi}{\partial N^2} < 0$, $\frac{\partial^2 \phi}{\partial L^2} < 0$, $\frac{\partial^2 \phi}{\partial N \partial L} > 0$.

To establish the zero profit condition, we will assume that the MFI, being an NGO, can obtain a number of donations or subsidies during the period, which add up to a given amount⁴ D . And, as it is usually the case, we will suppose that the MFI can only recover a fraction of the loans made, according to a given repayment performance, and also that the borrowers will repay their loans with interest. The total amount “obtained” at the end of the period can therefore be expressed as $(1+i)pN$, denoting $p \in [0,1]$ as the MFI’s repayment rate, and $i \in [0,1]$ as the interest rate. On the other hand, the MFI will allocate funds adding up to N , with labour costs totalling $c(1-v)L$ if we denote $c \geq 0$ as the unitary cost of labour and we further assume that a fraction $v \in (0,1)$ of the labour contributes voluntarily to the NGO – such that some tasks are performed by members of the organization without any monetary reward or payment.

In such a scenario, a given MFI is characterized by its utility function ϕ and a triplet (p, v, D) stating its repayment performance, its level of voluntary labour, and the total amount of donations received. Its best performance will be given by the following maximization problem:

$$\begin{aligned} \max \quad & \phi(N, L) \\ \text{s.t.} \quad & N + c(1-v)L = (1+i)pN + D \end{aligned} \quad (1)$$

Using the lagrangian function, $Z(N, L, \lambda) \equiv \phi(N, L) - \lambda [N + c(1-v)L - (1+i)pN - D]$, the first order conditions for solving the problem are:

$$\left. \begin{aligned} \frac{\partial Z}{\partial N} &= \frac{\partial \phi}{\partial N} - \lambda [1 - (1+i)p] = 0 \\ \frac{\partial Z}{\partial L} &= \frac{\partial \phi}{\partial L} - \lambda [c(1-v)] = 0 \\ \frac{\partial Z}{\partial \lambda} &= - [[1 - (1+i)p]N + c(1-v)L - D] = 0 \end{aligned} \right\} \quad (2)$$

⁴ Alternatively, D can be considered the total amount of funds (owned or borrowed) that the Institution is able to commit to the micro-credit program.

which can be used to obtain the optimal number of loans that should be allocated during the time period considered, and the optimal amount of labour that should be used to support the entrepreneurs, given the characteristics of the MFI.

Our purpose is to use the model to study how the different parameters involved could influence the optimal behaviour described in (1) or (2). As it will be shown, this depends crucially on the value of $\alpha \equiv 1 - (1+i)p$, i.e, on the relative contribution of the interest rate and repayment performance rate to the amount “recouped” of the total loans funded by the MFI. When $\alpha > 0$, we have $(1+i)p < 1$, and therefore there is a gap between the loans made by the MFI and the funds repaid by the borrowers. Therefore, the Institution does not reach self-sustainability (although, of course, this can be compensated if it can raise enough new funds). On the other hand, $\alpha < 0$ will indicate a self-sustainable organization.

As a starting point in our study, we will assume that the optimal values obtained in (2) depend on the value of the total amount obtained by donations given to the MFI, D . To measure the change in the behaviour of the MFI if there is an increase of D , we need to differentiate the set of equations in (2) with respect to this parameter, now considered a variable of the model. The differentiation gives the following lineal equations, expressed here in matrix notation:

$$\begin{pmatrix} \frac{\partial^2 \phi}{\partial N^2} & \frac{\partial^2 \phi}{\partial L \partial N} & -[1 - (1+i)p] \\ \frac{\partial^2 \phi}{\partial L \partial N} & \frac{\partial^2 \phi}{\partial L^2} & -[c(1-v)] \\ -[1 - (1+i)p] & -[c(1-v)] & 0 \end{pmatrix} \begin{pmatrix} \frac{dN}{dD} \\ \frac{dL}{dD} \\ \frac{d\lambda}{dD} \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ -1 \end{pmatrix} \quad (3)$$

This system, being linear, can be solved using Cramer’s rule. Since we shall need the determinant of the coefficients’ matrix, we can start by calculating its value, denoting the matrix as A :

$$\begin{aligned} |A| &= 2[1 - (1+i)p][c(1-v)] \frac{\partial^2 \phi}{\partial L \partial N} - [1 - (1+i)p]^2 \frac{\partial^2 \phi}{\partial L^2} - [c(1-v)]^2 \frac{\partial^2 \phi}{\partial N^2} = \\ &= 2\alpha [c(1-v)] \frac{\partial^2 \phi}{\partial L \partial N} - \alpha^2 \frac{\partial^2 \phi}{\partial L^2} - [c(1-v)]^2 \frac{\partial^2 \phi}{\partial N^2} \end{aligned}$$

The initial hypothesis regarding the utility function ϕ enables us to ensure that the two last terms of the above expression are always positive. And if $\alpha \equiv 1 - (1+i)p > 0$, so is the first one, and we get:

$$\alpha \equiv 1 - (1+i)p > 0 \Rightarrow |A| > 0 \left. \begin{array}{l} \frac{dN}{dD} = \frac{1}{|A|} \begin{vmatrix} 0 & \frac{\partial^2 \phi}{\partial L \partial N} & -\alpha \\ 0 & \frac{\partial^2 \phi}{\partial L^2} & -[c(1-v)] \\ -1 & -[c(1-v)] & 0 \end{vmatrix} = \frac{1}{|A|} \left[[c(1-v)] \frac{\partial^2 \phi}{\partial L \partial N} - \alpha \frac{\partial^2 \phi}{\partial L^2} \right] > 0 \\ \frac{dL}{dD} = \frac{1}{|A|} \begin{vmatrix} \frac{\partial^2 \phi}{\partial N^2} & 0 & -\alpha \\ \frac{\partial^2 \phi}{\partial L \partial N} & 0 & -[c(1-v)] \\ -\alpha & -1 & 0 \end{vmatrix} = \frac{1}{|A|} \left[\alpha \frac{\partial^2 \phi}{\partial L \partial N} - [c(1-v)] \frac{\partial^2 \phi}{\partial N^2} \right] > 0 \end{array} \right\} (4a)$$

We therefore find that when the MFI is not self sustainable, the effect of having access to expanded donations increases both the optimal number of loans and the optimal labour used by the MFI.

On the other hand, if $\alpha \equiv 1 - (1+i)p < 0$ we need to postulate a quasi negligible effect on the utility function of the combination effects of change in N and L to be able to draw some further conclusions:

$$\text{if } \alpha \equiv 1 - (1+i)p < 0 \text{ and } \frac{\partial^2 \phi}{\partial N \partial L} \approx 0 \Rightarrow |A| > 0 \left. \begin{array}{l} \frac{dN}{dD} = \frac{1}{|A|} \left[[c(1-v)] \frac{\partial^2 \phi}{\partial L \partial N} - \alpha \frac{\partial^2 \phi}{\partial L^2} \right] < 0 \\ \frac{dL}{dD} = \frac{1}{|A|} \left[\alpha \frac{\partial^2 \phi}{\partial L \partial N} - [c(1-v)] \frac{\partial^2 \phi}{\partial N^2} \right] > 0 \end{array} \right\} (4b)$$

that is to say that under a self sufficiency condition, coupled with a separable utility function, the MFI will not have any incentive to attract donors to increase the number of its loans, but any additional funds will be used to expand its labour capacity.

Let's turn now to the effect of changes in the repayment rate, p , in the optimal behaviour of the MFI⁵. Similar to the previous study, we can differentiate (2) to also obtain a linear system, which differs from (3) only on the right hand side. Specifically, the new system is:

$$\begin{pmatrix} \frac{\partial^2 \phi}{\partial N^2} & \frac{\partial^2 \phi}{\partial L \partial N} & -[1-(1+i)p] \\ \frac{\partial^2 \phi}{\partial L \partial N} & \frac{\partial^2 \phi}{\partial L^2} & -[c(1-v)] \\ -[1-(1+i)p] & -[c(1-v)] & 0 \end{pmatrix} \begin{pmatrix} \frac{dN}{dp} \\ \frac{dL}{dp} \\ \frac{d\lambda}{dp} \end{pmatrix} = \begin{pmatrix} -\lambda(1+i) \\ 0 \\ -(1+i)N \end{pmatrix} \quad (5)$$

and therefore our previous conclusions regarding the sign of the determinant of the coefficients' matrix still hold. Furthermore, the right hand side of the system exhibits a variable which has not appeared so far: the Lagrange multiplier λ , which represents the marginal utility of the MFI to an increase in the funds used to provide loans to its clients. Since we can suppose that the zero profit restriction is binding in the optimal behaviour of the MFI, the first order Karush-Kuhn-Tucker conditions for a differentiable optimization problem ensures that the optimal value of λ will be non negative. By solving (5) we get:

$$\frac{dN}{dp} = \frac{-(1+i)}{|A|} \begin{vmatrix} \lambda & \frac{\partial^2 \phi}{\partial L \partial N} & -\alpha \\ 0 & \frac{\partial^2 \phi}{\partial L^2} & -[c(1-v)] \\ N & -[c(1-v)] & 0 \end{vmatrix} = -\frac{1+i}{|A|} \left[-[c(1-v)]N \frac{\partial^2 \phi}{\partial L \partial N} + \alpha N \frac{\partial^2 \phi}{\partial L^2} - \lambda [c(1-v)]^2 \right]$$

$$\frac{dL}{dp} = \frac{-(1+i)}{|A|} \begin{vmatrix} \frac{\partial^2 \phi}{\partial N^2} & \lambda & -\alpha \\ \frac{\partial^2 \phi}{\partial L \partial N} & 0 & -[c(1-v)] \\ -\alpha & N & 0 \end{vmatrix} = -\frac{1+i}{|A|} \left[-\alpha N \frac{\partial^2 \phi}{\partial L \partial N} + \lambda \alpha [c(1-v)] + [c(1-v)] N \frac{\partial^2 \phi}{\partial N^2} \right]$$

Under the financial dependence condition of the MFI, when $\alpha > 0$, it is easy to see that $\frac{dN}{dp} > 0$, therefore making it foreseeable that additional funding provided by a better repayment performance will be used to increase the number of micro-credits lent by the organization. Less clear is the effect of this very increase on the amount of labour used

⁵ We shall not consider changes in the interest rate i , but it is straightforward to see that its consequences would be similar to those envisaged by changing p , since the effect in both cases is to change the total amount of the loans given recouped by the MFI.

by the MFI, because in this case the first and last summands of $\frac{dL}{dp}$ are clearly negative, but the second, $\lambda\alpha[c(1-v)]$ is strictly positive. Nevertheless, since its value tends to zero when the MFI is near to attaining sustainability ($\alpha \rightarrow 0$), we can also postulate a positive effect of a better repayment performance on the labour used by the MFI. We have then established that:

$$\text{if } \alpha \equiv 1 - (1+i)p > 0 \Rightarrow \frac{dN}{dp} > 0 \text{ and likely, } \frac{dL}{dp} > 0 \text{ (at least as } \alpha \rightarrow 0) \quad (6a)$$

Under the alternate hypothesis of the self sustainability of the MFI, however, it is clear that $\frac{dL}{dp} > 0$, and thus that at least part of the funds obtained due to even more entrepreneurs giving back their loans will be used to reinforce the MFI labour. But it is less clear whether the MFI will also allocate some of these additional funds to increasing the number of loans provided to its would-be clients. An obviously self sustainable organization (with $\alpha < 0$ large in absolute value) or one with huge concavity with respect to labour having a big number of clients, where $\alpha N \frac{\partial^2 \phi}{\partial L^2} > \lambda[c(1-v)]^2 \Rightarrow \frac{dN}{dp} < 0$ therefore will not allocate additional funds to expanding its clients' portfolio.

On the other hand, an MFI with a quasi-linear utility function with respect to the labour used (which would imply $\frac{\partial^2 \phi}{\partial L^2} \approx 0$) will have incentives to increase the optimal number of loans:

$$\text{if } \alpha < 0 \text{ and } \frac{\partial^2 \phi}{\partial N \partial L} \approx 0 \Rightarrow \frac{dL}{dp} > 0 \text{ and } \left\{ \begin{array}{l} \frac{dN}{dp} < 0 \text{ for MFIs with } \alpha N \frac{\partial^2 \phi}{\partial L^2} \text{ large enough} \\ \frac{dN}{dp} > 0 \text{ if } \phi \text{ is quasi linear with respect to } L \end{array} \right\} \quad (6b)$$

Finally, we turn to the study of the consequences of a change in the third parameter considered in the model: the fraction of voluntary labour that the MFI is able to co-opt. The differentiation of the set of conditions (2) with respect to v will now give the linear system:

$$\begin{pmatrix} \frac{\partial^2 \phi}{\partial N^2} & \frac{\partial^2 \phi}{\partial L \partial N} & -[1-(1+i)p] \\ \frac{\partial^2 \phi}{\partial L \partial N} & \frac{\partial^2 \phi}{\partial L^2} & -[c(1-v)] \\ -[1-(1+i)p] & -[c(1-v)] & 0 \end{pmatrix} \begin{pmatrix} \frac{dN}{dv} \\ \frac{dL}{dv} \\ \frac{d\lambda}{dv} \end{pmatrix} = -c \begin{pmatrix} 0 \\ \lambda \\ L \end{pmatrix} \quad (7)$$

which also has the same coefficient matrix A , but is different on the right hand side. Using Cramer's rule we get:

$$\frac{dN}{dv} = \frac{-c}{|A|} \left[\lambda \alpha [c(1-v)] - [c(1-v)]L \frac{\partial^2 \phi}{\partial L \partial N} + \alpha L \frac{\partial^2 \phi}{\partial L^2} \right]$$

$$\frac{dL}{dv} = \frac{-c}{|A|} \left[-\alpha L \frac{\partial^2 \phi}{\partial L \partial N} - \lambda \alpha^2 + [c(1-v)]^2 \frac{\partial^2 \phi}{\partial N^2} \right]$$

As it is quite obvious, the total labour of the MFI increases with any increase in voluntary contributions to the MFI, since it is straightforward enough to establish the positive sign of the second expression above:

$$\frac{dL}{dv} > 0 \text{ either when } \alpha > 0 \text{ or in a MFI with } \alpha < 0 \text{ and } \frac{\partial^2 \phi}{\partial N \partial L} \approx 0 \quad (8a)$$

a result which is a mere contribution to the reasonability of the model, since its predictions in obvious conditions correspond to what common sense dictates.

Nevertheless, the effect of an increase in voluntary labour on the total number of loans is more interesting, and not as clear. Similar to the previous study, we shall need to use the additional conditions of the MFI more carefully when to establishing a sign for $\frac{dN}{dv}$.

With analogous reasoning, we can establish that:

$$\frac{dN}{dv} > 0 \text{ when } \alpha > 0, \text{ at least as } \alpha \rightarrow 0 \quad (8b)$$

And also a slightly more complicated behaviour of self-sustainable MFIs, depending on its labour preferences:

$$\text{if } \alpha < 0 \text{ and } \frac{\partial^2 \phi}{\partial N \partial L} \approx 0 \Rightarrow \begin{cases} \frac{dN}{dv} < 0 \text{ for MFIs with } L \frac{\partial^2 \phi}{\partial L^2} \text{ large enough} \\ \frac{dN}{dv} > 0 \text{ if } \phi \text{ is quasi linear with respect to } L \end{cases} \quad (8c)$$

To summarize the findings of this section, we can start by saying that we have modelled the behaviour of a non-profit oriented MFI, assuming only a zero profit condition. As it

turned out, however, the behaviour of such an organization shall be strongly driven by the self-sustainability derived from its loans.

An organization which is currently not self sustainable has three simple strategies for enhancing its financial condition: to attract more donors to its micro-credit program fund, to improve the repayment behaviour of its borrowers, or to use more voluntary forces to contribute to the organization's efforts without any additional financial charge. We have proved [(4a) and (6a)] that the first two strategies will have a positive effect both in improving the number of its users (clients) and the labour effort employed to counsel them on their business projects. As a further consequence, the efforts made to try to become self sustainable will have another positive effect: the improvement of the utility function of the MFI, due to its direct liaison with the number of loans and total labour employed in its social mission.

The effect of the third simple strategy, increasing voluntary work within a non-sustainable organization, however, is less clear regarding the number of loans the MFI can fund. Presumably this is because the strategy does not make a direct contribution to the augmentation of the Institution's funds, which diminish when it is far from being sustainable. Thus, although the strategy has benefits for the organization, it is less significant except in a context of near sustainability [(8b)], when we can also prove its positive contribution to the utility of the MFI through an increase in users.

In the study of a self-sustainable organization, we have obtained somewhat different conclusions. In effect, we have proved that any increase in the funds available to the MFI (via donations or improvements in repayment performance) will primarily be directed at enhancing their labour force [(4b) and (6b)]. Direct contributions to the MFI's funds will never be re-directed into increasing their clients' portfolio, and neither will that usually be the case with the added resources obtained by additional clients giving back their loans. We find an exception to the last assertion when the MFI's utility function is directly proportional to its labour efforts. Only in this latter case have we been able to prove a net increase in the number of loans made by the MFI as a result of a better repayment rate [(6b)], and also as a result of an increase in voluntary labour [(8c)].

3. Microcredit programs in Catalonia

The start of Microfinance in Catalonia can be traced back to 1981, when the *Acció Solidària contra l'Atur*⁶ (ASCA) association made its first steps towards “alleviating poverty and especially the effects of unemployment” in Catalan society. It is now one of the three NGO managed organizations working in Catalonia in the field of Microfinance, together with FIDEM, an association established in 1997 with the explicit aim of improving female entrepreneurship, and COOP57, a social cooperative that has also a microcredit program since 2000.

Furthermore, from 2001, there has been an additional proposal for microfinance in Catalonia, the program set up by *Caixa de Catalunya*. Through one of its Foundations, the so-called *Fundació un Sol Món*, this savings bank offers support both to certain microcredit programs in the third world and directly to poor people in our country. This is not the only commercial bank⁷ that has made an attempt at microfinance: ICO (*Instituto de Crédito Oficial*), a governmental Spanish bank also designed a microcredit program in 2002, and other Financial Institutions are now considering entering this market.

In this section, we shall nevertheless confine ourselves to a brief description of the first three organizations mentioned, since it is in the context of non-profit driven MFIs that our model has been set, and therefore it is within these organizations that we can test the predictions and performance of the model.

As we have already mentioned, ASCA was created in 1981 as an association and constituted by private civil Foundation in 1984. They focus on making citizens aware the problems of unemployment, trying to channel their active participation into providing for the basic needs of individuals and families that have found themselves in precarious situations due to unemployment. Moreover, it aims to promote self-

⁶ The name can roughly be translated as “Solidarity Group Against Unemployment”, and its foundation date corresponds to one of the main industrial crises to have occurred in the country, also related to the increase in crude oil prices.

⁷ It is worth noting that savings banks in Spain are not exactly commercial banks in that they do not have stockholders, and by law they have to assign some of their annual profits to setting up “social initiatives”.

employment by giving support to business initiatives set up by the unemployed and also by facilitating funds for them to be able to acquire the working tools to make a living.

The economic resources of *Acció Solidària contra l'Atur* are taken from its Solidarity Fund, nourished with donations by individuals, groups, and other private or social organizations, as well as the returns from its microcredit programs and other resources coming from governmental or communal grants and subsidies. As can be observed in table 3.1, the ASCA's total annual income is not constant, so the organization depends on "external" factors such as the its borrowers' repayment rate, or the social and political appraisal of its task, upon which donations and official subsidies are assembled.

Typically, almost 88% of its annual budget is spent on the three main Foundation programs, namely:

- The *Occasional Aid Program (Programa d'Ajuts Puntuals)*, a program intended to help unemployed individuals and homes without subsidies that, under certain special circumstances, do not have enough money to cover basic subsistence expenses. This occasional aid never requires repayment and would never add up to more than 600 euros a time.
- The *Self-employment Program (Programa d'Autoocupació)*, which in turn has two different and complementary aims. The first was designated to facilitate the purchase of specific working tools (such as sewing machines, for example) to individuals with the skills to make their living through them, although by now the definition of a "tool" is used somewhat more loosely. The second is a microcredit program that lends to would-be entrepreneurs and other civil associations of the social economy to help set-up or pursue their business projects.
- Finally, the *Sant Cugat-Valldoreix Social Program* was incorporated in 2001. Its funding came from another social organization aiming to alleviate poverty and help illegal immigrants seeking to regularize their situation. The initial program is currently being followed up by ASCA, having also integrated its voluntary force.

The rest of the expenditure in the ASCA's budget is on overheads, including staff, publications and diffusion, equipment and amortization; accounting only for 12% of its total income. It is worth mentioning that these expenses are exceptionally low due to the active role of its volunteers in the management of the organization and the follow-up of

its different projects and social tasks. According to its leaders, ASCA's voluntary work adds up to approximately 3,000 annual hours, which would amount to having an extra staff of 6 people, thus tripling the actual paid staff. Furthermore, it is estimated that 50% of the total voluntary labour is used on the follow up the business projects settled with the micro-credits lent by ASCA. To this, it can be added that the ASCA General Board is made up of 20 volunteers meeting at least twice a year, and it has a permanent commission of 7 members supervising the actual management of the programs, holding meetings twice a month.

Table 3.1. Income and expenditure of *Acció Solidària contra l'Atur*.

	2000	2001	2002	2003
INCOME				
Total private donations	220,837.99 €	273,181.90 €	296,120.95 €	243,769.49 €
Governmental subsidies	58,662.5 €	43,796.25 €	30,225.27 €	68,297.75 €
Repayments Self-employment Program	138,015.01 €	190,887.94 €	206,697.25 €	173,839.64 €
Repayments Sant Cugat-Valldoreix Program		49,884.00 €	179,816.96 €	196,949.62 €
Additional income (interest, ...)	6,345.25 €	9,872.89 €	7,406.63 €	5,447.08 €
TOTAL INCOME	423,861.00 €	567,622.98 €	720,267.06 €	688,303.58 €
EXPENDITURES				
Occasional Aid Program	89,233.71 €	106,591.01 €	135,172.10 €	142,220.81 €
Self-employment Program	328,050.59 €	278,555.29 €	287,699.13 €	211,442.94 €
- Purchase of working tools	45,133.58 €	47,780.00 €	50,538.10 €	56,792.16 €
- Business Projects	282,917.01 €	230,775.29 €	237,161.03 €	154,650.78 €
Sant Cugat-Valldoreix Social Program		90,842.98 €	195,990.96 €	208,825.00 €
Overheads	61,222.34 €	62,784.65 €	71,543.69 €	78,458.14 €
Awards funded	1,326.72 €	23,465.32 €	19,970.05 €	20,849.19 €
Remainder	-55,972.37 €	5,383.75 €	9,891.13 €	26,507.50 €
TOTAL EXPENDITURES	423,860.99 €	567,623.00 €	720,267.06 €	688,303.58 €

Source: Memories of *Acció Solidària contra l'Atur*

The analysis of the business projects and other petitions addressed to ASCA is made by its staff (volunteer or paid), who usually meet several times with the would-be beneficiaries to assess their needs, requirements and capacities. In specific reference to business projects, criteria used include economic viability in the medium and long term, "social maturity" (therefore ensuring the quality of new jobs created, with suitable contracts and working conditions), as well as the contribution to sustaining social cohesion. Once a loan is approved, access to the credit (or the agreed tool) is immediate, since ASCA uses its own funds. Furthermore, ASCA does not charge any interest rate to its borrowers, and repayment is settled individually for each project, according to its forecast profits.

Lets turn now to the second organization mentioned: The *Fundació Internacional de la Dona Emprenedora* (International Foundation of the Entrepreneurial Woman, or FIDEM) a private, independent and non profit-driven institution set up in Barcelona in April 1997. Its main goal is to support entrepreneurial women, offering advice, access to funding and international commercial networks to exchange products and services.

The FIDEM Micro-credit program involves facilitating loans of up to 15,000 euros to women wishing to create their own business. To qualify, a woman must not have the kind of guarantees that would give her access to a loan from a commercial bank, and in due course must present an economically viable certified business project. To further ensure the viability of the project, a member of FIDEM would usually meet one or several times with the would-be entrepreneur, since the organization considers the woman's personality and familiar entourage to be key factors in the success of any business project.

To be able to fund the entrepreneurial women, FIDEM has a social fund settled by its members. Nevertheless, the fund is not used to actually provide the loans, but only to guarantee the Institution against any default by its borrowers. In the first stages of the implementation of the program, FIDEM had an agreement with two different Financial Institutions, deriving the loans to one or the other depending on their role in the business project: the official *Institut Català de Finances* for investment, and *La Caixa*, a savings bank, for working capital. From 2002 on, all recommendations for loans are directed to *La Caixa*. The agreement between FIDEM and the savings bank includes a fixed interest rate (5% in 2004), a fixed term (usually 5 years, delaying the first repayment by a period of 6 months) and a limit on the total amount in commissions the bank can charge.

Since FIDEM does not use its own resources in its micro-credit program, it does not seem necessary to report income and overheads here, because there is no direct relationship with the funds that can be allocated to the program. Nevertheless, table 3.2. illustrates the main outputs of the program. The number of loans promoted by FIDEM in a given year depends on the feasibility of the presented entrepreneurial projects, so that the total amount funded, as well as the results of the projects (expressed here by

means of the number of new jobs furnished) are highly variable, and difficult to forecast beforehand.

Table 3.2. FIDEM Micro-credit program in figures

	2000	2001	2002	2003
Number of applications	28	38	17	22
Number of accepted projects	22	24	9	15
Sectorial Distribution:				
<i>Industry</i>	4.55%	8.34%	11.12%	13.34%
<i>Services</i>	95.45%	91.66%	88.88%	86.66%
Number of new jobs created	54	63	11	28
Total amounts awarded	92,591.92 €	237,399.78 €	126,834.79 €	176,253.00 €

Source: Data extracted from our own study within the Institution

The third Institution considered in this section is COOP57, a social cooperative that uses its own resources to give loans to social economy projects, with the aims of “promoting employment, fostering cooperativism, associationism and solidarity between people”, and also “promoting sustainability on the basis of ethical and solidarity principles”.

As members of COOP57, we can find both organizations and individuals. Within the first category, cooperatives, associations, foundations or other social economy organizations should “carry out economical activities in an autonomous way, using economic democracy criteria”, and “share the principles of ethical and solidary funding”. Membership carries a minimum compulsory disbursement of 901.51 euros, enabling the organization to share the results of COOP57 but not to have any kind of remuneration. Nevertheless, any corporative member can make additional voluntary contributions of capital, which are then remunerated using the annual interest rate decided by the Assembly of all members of COOP57. In 2003, the Assembly decided to set the figure of 2.60% as the annual interest rate⁸. By November 2003, COOP57 had a total of 50 cooperatives and 22 associations, unions, federations and self-employed workers.

In addition, COOP57 also has individual members, who share “the principles of ethical and solidary funding”, but cannot be borrowers. In this case, the minimum compulsory membership fee is 300.51 euros, although they can also make additional voluntary

⁸ For comparative purposes, during 2003 the remuneration given by the financial institutions to private savings fluctuated between 2.50% and 3.25%.

contributions, thus encouraging private savings to be channelled through COOP57 to the social economy organizations. Contributions are made for a three-year time period, renewable for equal periods, and are remunerated annually, using the same interest rate decided as already mentioned. At the end of 2003, COOP57 had a total of 152 individual members that had deposited savings in the cooperative. Table 3.3 summarizes the contributions made during the 2000-2003 period.

Table 3.3. Contributions of members and partners of COOP57

	2000	2001	2002	2003
Compulsory membership fees	209,321.00 €	233,957.0 €	239,604.00 €	241,978.00 €
Voluntary contributions from corporative members	90,976.00 €	156,846.00 €	180,387.00 €	222,603.00 €
Voluntary contributions from individual members	61,233.00 €	204,616.00 €	345,903.00 €	414,962.00 €

Source: www.coop57.coop

COOP57 only offers loans to its corporative members, and the figures involved, as well as the proceedings used, enable us to qualify them under the microfinance label. The products range from short term loans for funding new business projects to long term loans for facilitating investments, “bridge-loans” to those organizations that have been granted official subventions (until the administration actually pays up the grant), and loans for funding working capital in short-term operations. The cost of these services is also decided annually by the Assembly, obviously building on the savings interest rate. In 2003, the interest rate was fixed, on average, adding an additional 4.5% to the savings interest rate.

Since the opening of its microcredit services, and until the end of 2003, COOP57 has granted more than 60 loans. Each one has been studied by its staff and further analysed by its Technical and Social Commission, issuing a report to the cooperative’s Ruling Board, which is ultimately responsible for the loans. Acting in total opposition to the group loans granted by Institutions such as the Grameen Bank, COOP57 divides the responsibility between the members of the borrowing cooperative or organization. Therefore, in a 5 member cooperative, for example, each individual would be held responsible for just one fifth of the total amount lent. Up to now, however, the rate of slowness is zero, mainly because in the absence of bankruptcy, COOP57 has allowed

the renegotiation of the terms of some loans, to allow the failing organization to overcome any financial crisis. Table 3.4 summarizes the loans and repayments.

Table 3.4. Granted and repaid capital in COOP57

	2000	2001	2002	2003
Funds invested in loans	68,541.00 €	309,407.00 €	231,090.00 €	277,370.00 €
Amount of repayments	74,827.00 €	122,739.00 €	151,603.00 €	131,326.00 €

Source: www.coop57.coop

To conclude this section, we should observe that, in spite of the differences (in reach, formulation of its mission, used funds, etc), the three Institutions, and especially the first two, greatly resemble the typology and management of its micro-credit programs. The following points summarize these aspects:

1. Loans are made to individuals, in the strictest sense, since even in projects where there is more than one agent responsible, the loan is granted only to one (often designated by the Institution itself).
2. Customers fidelization, through the concession of reiterated or progressive loans, is not contemplated in any of the programs.
3. A prior requirement for the consideration of any business project is its detailed presentation, including a feasibility plan guaranteed by an independent institution.
4. Interviews are practically the only method used for the intuitive determination of the capacity and reliability of the would-be borrower. Private communications sustained with staff in both Institutions indicate that this is taken much more into account than the business project itself, which is used more as an initial filter.
5. Specific or formal training is neither required nor offered within the micro-credit programs. Only in the case of FIDEM is there any mention of organized meetings for its members, including the new entrepreneurs funded by FIDEM, which have a certain resemblance to MFI methodology such as the *Grameen Bank*, even though in this case assistance is not compulsory.

Moreover, COOP57 only differs from the two former Institutions in the first (since loans are not made to individuals, but even here responsibility for repayment is not collective) and third epigraphs (there is no external appraisal of the business project, which, on the contrary, is studied within the Institution), whereas the remaining aspects are very similar.

4. The model and the microcredit programs in Catalonia

After describing the three Catalan MFIs in the previous section, we now relate the empirical data shown there to the theoretical results obtained via the model studied in section 2. The primary distinctive feature we must point out is that each MFI represents a different approach to the problem of financial sustainability, a fortunate characteristic, in that it will enable us to contrast diverse hypotheses.

The first MFI described, ASCA (*Acció Solidària Contra l'Atur*) is, almost by its own definition, an Institution that would never be self-sufficient if we only consider its financial operation. In effect, since ASCA has decided not to charge any interest on the micro-credits lent to its beneficiaries, the parameter α used in the model will always be strictly positive: $\alpha \equiv 1 - (1+i)p = 1 - p > 0$, because it would require the repayment of the exact totality of its loans to end up with the same funds ASCA had at the start of any given period. And if we take into consideration the fact that ASCA makes some of its loans without expecting them to be repaid, there is an obvious conclusion.

A graphical representation of some relevant data (extracted from Table 3.1) will help us understand how the Institution has been able to cope with its micro-credit program over such a long period of time. It is mainly due to the maintainance of a quasi-constant level of donations and subventions to fill the gap between funds invested and borrower repayments. It also has a constant level of operating costs, i.e. a constant level of paid labour.

Figure 4.1. Relevant data from ASCA (2000-2003)

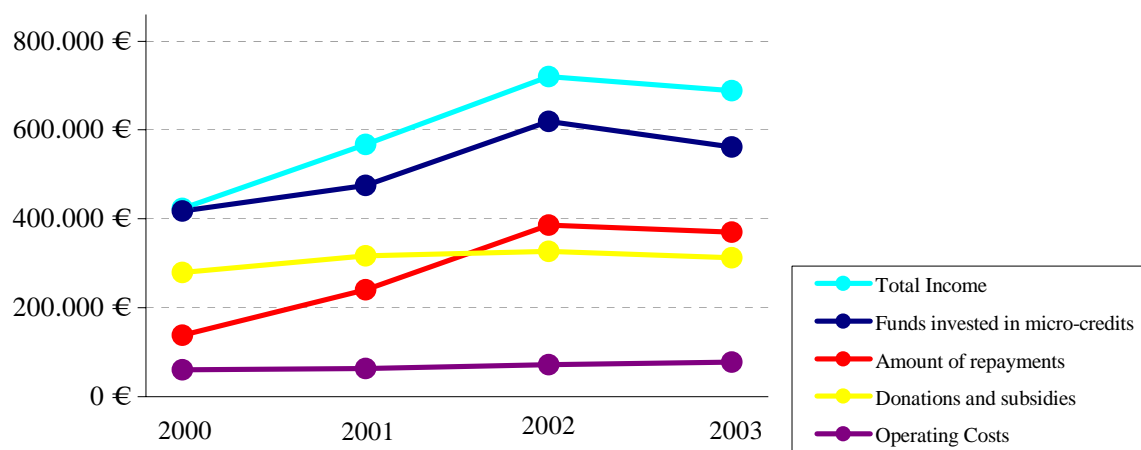


Figure 4.1. also illustrates the behaviour of the MFI with respect to changes in its repayment performance, and it turns out that it acts as was predicted by the model. Everything else being constant, any increase in the amount recuperated by the MFI has been re-invested into increasing the number of borrowers accepted within the program. As a result, the shapes of the curves showing the evolution of both quantities are very similar, as they theoretically should be, according to (6a).

Furthermore, we must point out that in the case of ASCA, the improvement in repayment performance has not led to an increase in hired labour used within the organization, mainly because of the very active role of the voluntary part of the labour. Since the mission of this Institution is related to a beneficiary population at a high risk from a financial point of view, the task of following-up the business projects of the MFI's clients (which is considered the key to any improvement in repayment) is quasi-exclusively the responsibility of the voluntary members of the organization. And this is a well performed task, since the repayment rate is better than it could be given the aforementioned high risks (for the last five years, around 70%, which can be considered a good performance rate). On the other hand, since the institution is not close to attaining sustainability, the increase in the voluntary level of labour can not have any added influence on the number of loans the Institution is able to fund, a result which also conforms with our theoretical findings in (8b).

Let us turn now to the case of FIDEM (*Fundació Internacional de la Dona Emprenedora*). The first thing to point out is that FIDEM does not provide micro-credits in itself, but only facilitates the concession of a credit that is actually granted by a regular Financial Institution. Therefore, its social fund is only designed to guarantee any lack of repayment by the borrowers appointed by FIDEM. Furthermore, the organization does not regularly receive (to date) any kind of donation or subvention, and uses the income provided by its members (through fees) to cover its (relatively low) operating costs. So, here we can not speak of the self-sustainability of the MFI in an ordinary way as in our previous model, but since it is a very imaginative proposal, we feel it is useful to discuss its functioning.

We shall consider that the MFI's loans have a zero interest rate, since their clients would actually pay the interest due to another organization, and in this respect, FIDEM

would not have any kind of income. Therefore, the sustainability of the organization would crucially depend on the value of $\alpha \equiv 1 - (1+i)p = 1 - p$. And since it does not have any donations to fill the gap should there be any lack of repayment (for which the Institution would be considered responsible), its behaviour would be strongly conditioned by the necessity to bring parameter α as near to zero as possible, and therefore try to ensure a 100% repayment rate. Moreover, in this case repayment rates have a double repercussion on the Institution, since a low repayment performance would not only undermine the organization's social fund, but would also weaken the confidence of the Financial Institution that is actually giving the loans, which would consequently be less interested in continuing a relatively high level of investment in the FIDEM project and could even terminate the relationship with the NGO.

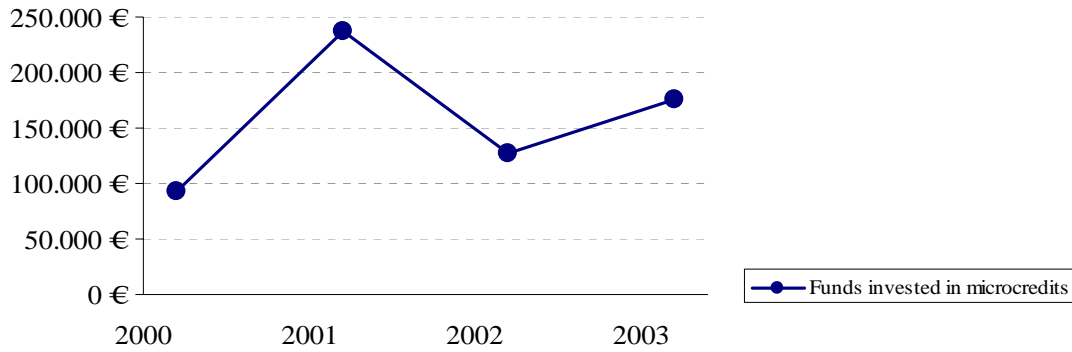
As a consequence, and using the framework given by our model, the only strategy available to FIDEM is that of using voluntary labour to ensure as high a repayment rate as possible. And, in effect, this is the strategy we can observe within the Institution, where its members (and not the organization's staff) are solely responsible for appointing a would-be (female) entrepreneur, using very strict and thorough methodology. It is also the members of FIDEM who use their time to back up the business ventures of the chosen entrepreneurs, with individual and collective meetings held regularly at least during the loan period⁹.

Besides, this MFI can be qualified as being near to sustainability, since it actually maintains $p \approx 100\%$, and therefore our model predicts an increase in the number of loans with more voluntary labour used (8b). Nonetheless, in a representation of the joint investment made in micro-credits through FIDEM (Figure 4.2) we can easily observe that there is a certain fluctuation of the funds invested over time. In our opinion, two complementary reasons can explain this fluctuation. The main one is the fact that the Institution can only make loan recommendations when "suitable" business projects are presented to the Institution, and in this case this means a very risky adverse selection in order to ensure the profitability of any accepted project, and thus the repayment of the loan. In addition, we have to take into account the fact that the organization can not

⁹ We cannot present the actual data showing the repayment performance of the beneficiaries of FIDEM's program, since they are only known to the Financial Institution making the loans, but within the Institution they claim never to have had to resort to its especial Guarantee Fund. Therefore, we can expect some kind of delay in paying up, but not necessarily any unpaid loans.

ensure a constant level of voluntary labour over time, thus causing extra disturbances in the final figures.

Figure 4.2. Relevant data from FIDEM (2000-2003)



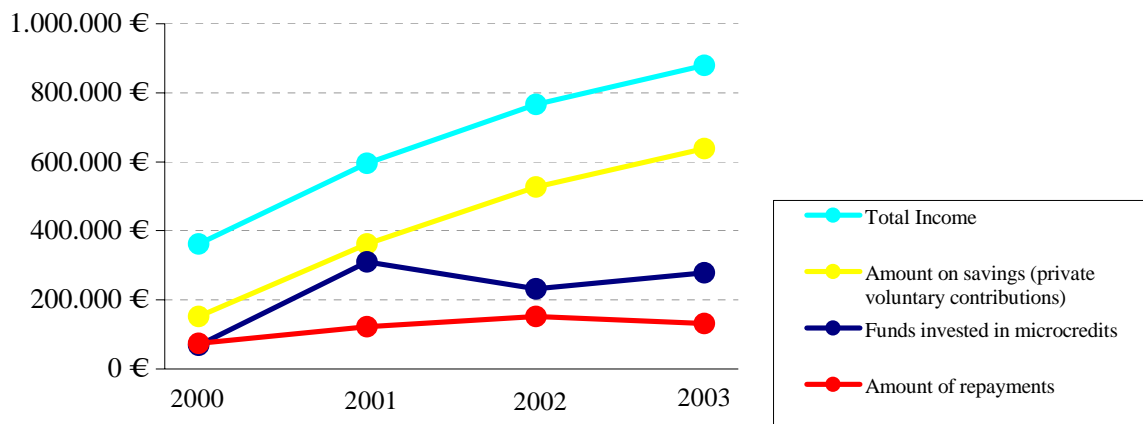
Last, but not least, we shall discuss the third organization described in the previous section, COOP57. In this case we must start by emphasizing that this is currently a self-sustainable organization, not only because it has established a positive interest rate for its loans, but also because it has an enviable repayment performance, attaining 100% to date. As a result, the relevant parameter of our model for COOP57 regarding self-sustainability, α , shall be of a non-positive value: $\alpha \equiv 1 - (1 + i)p = 1 - (1 + i) = -i < 0$. The structure of the organization has much to do with this performance, since it is a cooperative only offering loans to its members that are, in turn, cooperatives¹⁰, and therefore can easily establish bonds between them in order to enhance the efficient use of the funds provided by micro-credits.

On the other hand, although COOP57 does not have donors or subsidies, it can guarantee a fair level of income because it has a savings program for its members (individual or cooperatives). In Figure 4.3, we can observe that the evolution of this savings-program is parallel over time to that of the total income of the organization, and that the figures have been increasing constantly. However, this same Figure shows that the progress of the funds invested in its micro-credit program is not analogous, a result which again conforms with our model's predictions: in a self-sustainable MFI, an

¹⁰ A restriction which is not as binding as it seems, because it is possible for a group adhering its principles to join the cooperative.

increase in donations (which can be compared here with the result of the savings program) does not necessarily entail an increase in the number of loans funded by the organization.

Figure 4.3. Relevant data from COOP57 (2000-2003)



Instead, the model predicts an increase in the labour used by the Institution, which is for sure the case with COOP57, especially because here we have an additional reason for it to increase, related to its savings program, namely the origin of extra income. In effect, since savings are remunerated (at an interest rate lower than that used for micro-credits, but unambiguously positive), it is crucial to the Institution to make “good use” of the funds, and it is therefore necessary to have personnel qualified for its adequate management¹¹.

One final comment on Figure 4.3 is that although the amount of repayments showed seems to contradict the previous assertion of a 100% level, it has to be considered that the usual loan term is longer than one year, and therefore there is no exact correspondence between loans and repayments within the same period.

¹¹ Unfortunately, it has been impossible to date to obtain the exact data concerning the operating costs of COOP57 in order to adequately contrast this hypothesis. Nevertheless, in private communication with members responsible for the organization, we have learnt that they consider their main problem to be the lack of sufficient technical personnel to cope with the constant increase in savings derived for their Institution, and the adequate use of the funds, which is a clear indication in the sense provided by our model.

5. Conclusions

In this paper, we present a model for studying the behaviour of an MFI, and, consequently, being able to make predictions with respect to changes in some of the parameters used to represent its special characteristics. The comparison between the theoretical results obtained and the actual behaviour of some observed organizations seems to confirm the utility of the model presented, at least as an instrument for developing a further understanding of the relationships between the main aim of the MFI, (which is supposedly to use its funds to allocate micro-credits in the best possible way in accordance with its mission) and the strategies used to become (or remain) a financially sustainable organization.

Among the characteristics that differentiate MFIs managed by NGOs from other financial institutions, we have included the level of voluntary labour within the organization. We believe that the presence of voluntary labour is at the core of any NGO, and should therefore be reflected in the framework of the model. Furthermore, it is worth studying the role of voluntary labour and the economic effects of its involvement in the organization, a question that is not frequently addressed in literature. The results obtained confirm the positive contribution, both directly, by improving the utility of the MFI, and indirectly, when voluntary labour can be used to guarantee good management of the Institution's funds. Nevertheless, it should be commented that voluntary labour cannot substitute the provision of actual funds, which would be needed for the continuation of the NGO's mission and the MFI.

We have also discussed two additional items that we consider relevant for the MFI: the amount of donations (or other sources of income for funding the MFI's micro-credit program) and its repayment performance. In our study of actual organizations, we have been fortunate enough to find that that the only three MFIs that are genuinely managed by NGOs in Catalonia present distinct characteristics, and each one can be naturally identified with one (and only one) of the three theoretical parameters considered in the model. In effect, ASCA can represent a "model" for those MFIs that have a fair level of voluntary labour, and an amount of donations and subventions that can be taken as constant over time. It therefore provides a good illustration of the dependence of such an MFI on the actual level of repayment shown by its borrowers. Additionally, we have

been able to take COOP57 as an example of the relationship between labour and utility within a self-sustainable Institution.

We shall need a larger series of data and the study of further organizations to determine whether the model is indeed useful, and to what extent. Re-examination of the hypothesis used in the light shed by actual organizations should also be used to be able to formulate more precise hypotheses or to include additional features in the model.

REFERENCES

- ANDERSON, C. Leigh – LOCKER, Laura (2002): Microcredit, Social Capital, and Common Pool Resources, *World Development* 30(1), pp. 95-105.
- CONLIN, Michael (1999): Peer group micro-lending programs in Canada and the United States. *Journal of Development Economics*, 60 (1), pp. 249-269.
- DALEY-HARRIS, S. (coord.) (2002): Estado de la Campaña de la Cumbre del Micro crédito, informe 2002. Published in <http://www.microcreditsummit.org/>
- EUROPEAN COMMISSION REPORT (2003): Microcredit for small business and business creation: bridging a market gap. *Enterprise Directorate General of the European Commission*.
- EVERS, Jan (2001): Microcredit lending as a Model for Efficient Commercial Small-Scale Lending and its Applications in Banks. Published in www.micro-credit.net.
- GODQUIN, Marie (2004): Microfinance Repayment in Bangladesh: How to Improve the Allocation of Loans by MFIs. *World Development*, 32(11), pp. 1909-1926.
- KEVANE, Michael – WYDICK, Bruce (2001). Microenterprise Lending to Female Entrepreneurs: Sacrificing Economic Growth for Poverty Alleviation? *World Development*, 29 (7), pp. 1225-1236.
- KHANDKER, M.A. – MEYER, R. (1998): *Fighting Poverty with Microcredit: Experience in Bangladesh*. Oxford U. Press for World Bank, New York.
- MORDUCH, Jonathan (1999a): The Microfinance Promise. *Journal of Economic Literature*, 37, pp. 1569-1614.
- MORDUCH, Jonathan (1999b): The role of subsidies in microfinance: evidence from the Grameen Bank. *Journal of Development Economics*, 60, pp. 229-248.
- MOSLEY, Paul (2001): Microfinance and Poverty in Bolivia. *Journal of Development Studies*, 37 (4), pp. 101-132.

- PATTEN, Richard H. – ROSENGARD, Jay K. – JOHNSTON, JR. Don E. (2001):
Microfinance Success Amidst Macroeconomic Failure: The Experience of Bank
Raykat Indonesia During the East Asian Crisis. *World Development*, 29 (6), pp.
1057-1069.
- SCHREINER, Mark – WOLLER, Gary (2003): Microenterprise Development
Programs in the United States and in the Developing World. *World Development*,
31 (9), pp. 1567-1580
- SMITH, STEPHEN C. (2002): Village Banking and Maternal and Child Health:
Evidence from Ecuador and Honduras. *World Development*, 30 (4), pp. 707-723.