

**THE MICROECONOMICS OF AN INDIGENOUS AFRICAN INSTITUTION:  
THE ROTATING SAVINGS AND CREDIT ASSOCIATION**

**Rogier van den Brink\*  
Jean-Paul Chavas\*\***

---

\* Cornell Food and Nutrition Policy Program.

\*\* University of Wisconsin-Madison, Department of Agricultural Economics.

The authors wish to thank Philippe Callier, Paul Dorosh, Michael Kevane, J. D. von Pischke, and Stephen Younger for comments on an earlier version of this paper.

The Cornell Food and Nutrition Policy Program (CFNPP) was created in 1988 within the Division of Nutritional Sciences, College of Human Ecology, Cornell University, to undertake research, training, and technical assistance in food and nutrition policy with emphasis on developing countries.

CFNPP is served by an advisory committee of faculty from the Division of Nutritional Sciences, College of Human Ecology; the Departments of Agricultural Economics, Nutrition, City and Regional Planning, Rural Sociology; and from the Cornell Institute for International Food, Agriculture and Development. Graduate students and faculty from these units sometimes collaborate with CFNPP on specific projects. The CFNPP professional staff includes nutritionists, economists, and anthropologists.

CFNPP is funded by several donors including the Agency for International Development, the World Bank, UNICEF, the Pew Memorial Trust, the Rockefeller and Ford Foundations, The Carnegie Corporation, The Thrasher Research Fund, and individual country governments.

© 1991 Cornell Food and Nutrition Policy Program

ISBN 1-56401-115-1

This Working Paper series provides a vehicle for rapid and informal reporting of results from CFNPP research. Some of the findings may be preliminary and subject to further analysis.

This document was word processed by Jools Proffitt. The text was formatted by Gaudencio Dizon. The manuscript was edited by Elizabeth Mercado. The cover was produced by Jake Smith.

For information about ordering this manuscript and other working papers in the series contact:

CFNPP Publications Department  
1400 16th Street NW, Suite 420  
Washington, DC 20036  
202-822-6500

or

308 Savage Hall  
Cornell University  
Ithaca, NY 14853  
607-255-8093

## CONTENTS

LIST OF TABLES	iv
FOREWORD	v
1. INTRODUCTION	1
2. WHAT IS A ROSCA?	3
3. MICROECONOMIC FOUNDATIONS	5
4. MINIMIZING RISK AND TRANSACTION COSTS	14
5. COMPARATIVE INSTITUTIONAL PERFORMANCE: EMPIRICAL EVIDENCE	20
6. POSTSCRIPT: ON CREDIT AND INSURANCE	26
7. CONCLUSIONS	29
REFERENCES	31

## LIST OF TABLES

- |   |   |                                                                             |    |
|---|---|-----------------------------------------------------------------------------|----|
| 1 | - | Number of ROSCAs, by Average Contribution and Membership, Big Babanki, 1980 | 15 |
|---|---|-----------------------------------------------------------------------------|----|

## FOREWORD

Imagine an individual somewhere in Africa faced with the problem of financing a major purchase. There are the following options. First is to open a savings account in the local bank. The person could make regular deposits and accumulate interest until he or she has enough funds to acquire the particular good in question. The second option is to take out a loan with the bank. The good could then be purchased immediately, and the loan plus interest would be repaid over time. The third option is to join a rotating savings and credit association (ROSCA) in the village. In this working paper, van den Brink and Chavas come to the rather surprising conclusion that, given certain conditions, the average individual would deem the ROSCA a more efficient institution to achieve his or her goal than the bank.

In an era of structural adjustment in which many policymakers are advocating the disengagement of the state from the economy, this finding is of considerable importance. In particular, the neoclassical critique of the role of the state is based on the premise that private sector institutions will foster the development of competitive markets. This critique, however, has been recently challenged by those who argue that market failures and rents associated with indigenous market institutions make any development policy predicated on radical state disengagement a perilous path to follow. Therefore, in order to begin to clarify the arguments on the proper role of the state, and the capacity of private sector institutions to operate in an unfettered manner to promote economic development, it is of paramount importance to examine the issue of whether indigenous economic institutions are efficient and equitable, and under what circumstances they serve as the basis for promoting sustainable growth.

Given the vital role that credit plays in agricultural development, and the well-documented failure of many formal credit programs, this analysis provides a good example of the capacity of informal institutional structures. The policy lessons to be learned from the functioning of the ROSCA are not direct, however. The authors correctly point out that local, indigenous institutions have no a priori superior claim to efficiency. Nonetheless, the institutional structure of the ROSCA provides many lessons of direct relevance to the design of appropriate credit technology. In particular, the results of the study admonish caution before any more undue experimentation with the implementation of Western institutional designs is undertaken, especially with the backing or under the control of the state and without a fuller understanding of indigenous institutions. Consequently, the paper constitutes a valuable contribution to the application of the "new" theory of economic institutions. In this emerging body of literature, institutions are seen as a rational solution to the problem of minimizing the costs of economic transactions within a context of uncertainty and imperfect information.

Washington, DC  
November 1991

David E. Sahn  
Deputy Director, CFNPP

## 1. INTRODUCTION

During the 1970s the economies of many sub-Saharan countries typically experienced all or part of the following: rampant inflation, overvalued currencies, falling real producer prices, plummeting exports, shortages of foreign exchange, and shortages of consumer goods. An economic crisis ensued in the 1980s. However, the crisis was mostly a crisis of the market economy associated with formally organized economic institutions, as it appears in the national accounts of the various countries. It is not clear whether less formal economic institutions also went through a crisis during this period. It is now widely acknowledged that informal institutions play an important role in the allocation of product, labor, land, and capital in most developing countries. Moreover, there is some evidence that the informal sector of the economy may have actually risen in importance during the crisis years, thus preventing a sharp decline in the standard of living (Sahn and Sarris 1991). Unfortunately, because many activities in the informal sector fail to be captured in national accounts, our current understanding of this sector is rather rudimentary. As a result, the role of informal institutions in economic development clearly needs to be refined. This would be particularly true if the informal sector can help compensate for some of the failures of the formal sector.

This paper focuses on informal credit institutions in sub-Saharan Africa.<sup>1</sup> At this time, the performance of such institutions is not well understood. A fairly common view among microeconomists seems to be that informal credit markets are not competitive. On the other hand, among macroeconomists, they are sometimes assumed to be perfectly competitive and virtually indistinguishable from a standard neoclassical "bond" market ((e.g., Van Wijnbergen 1983; Fry 1988; Owen and Solis-Fallas 1989).

Alleged imperfections – market failures – have often provided the justification for formal government intervention in credit markets. Unfortunately, it seems fair to conclude that the numerous attempts to repair credit market failures by government intervention have often led to government failures. It has been argued that such failures – market and government alike – are the result of informational problems in the context of economic uncertainty (Stiglitz 1989). However, the syndrome of "multiple market failures" is as difficult to interpret for the formulation of specific policies as are the notions of perfect competition and complete information.

In light of current knowledge and the ambiguity of formal theory with respect to policy formulation, more analysis on the performance of informal

---

<sup>1</sup> For a general introduction to rural credit markets in developing countries, see von Pischke et al. (1983).

credit markets is needed. The objective of this paper is to analyze from a microeconomic perspective a particular variant of financial intermediation which is found throughout the world. The *njangeh*, as it is known in the Grassfields of Cameroon, is a member of a worldwide family of indigenous savings and credit clubs that have been named rotating savings and credit associations, or ROSCAs (Bouman 1977; Illy 1973).<sup>2</sup> The ROSCA is a widespread phenomenon in the rural and urban economies of much of sub-Saharan Africa (e.g., Ardener 1953 and 1964; Geertz 1962; Miracle, Miracle, and Cohen 1980; and Nweze 1990). It is rather amazing that it has received very little attention from economists.<sup>3</sup> This lack of attention is somewhat surprising, given the prominent role of another institution in the literature on economic development and credit markets: the stereotypical Asian landlord-cum-moneylender (e.g., Bhaduri 1973; Basu 1984; and Hart 1986).

The organization of this paper is as follows. First, the basic structure of the *njangeh* as a particular type of rotating savings and credit association is presented. Second, a model is developed in an attempt to refine the microeconomic foundations of ROSCAs. Third, some empirical evidence will be examined from ROSCAs in Cameroon. The analysis presented is based on fieldwork undertaken over a six-month period in 1979/1980 in a village in Cameroon named Big Babanki.<sup>4,5</sup> In the analysis, the following questions will be investigated: "To what economic problem does the ROSCA provide an institutional answer?" and "How efficient is the institution compared with other forms of financial mediation?" Finally, a number of policy implications are suggested.

---

<sup>2</sup> The ROSCA is known as *tontine* in Francophone West Africa, *dashi* among the Nupe in Nigeria, *isusu* among the Ibo and Yoruba, and as *susu* in Ghana. It is called *ekub* in Ethiopia. In Tanzania, it is called *upatu*, whereas it is known as *chilemba* in many other parts of East Africa. In other parts of the world, the ROSCA is called *arisan* (Indonesia), *pia huey* (Thailand), *ko* (Japan), *ho* (Vietnam), *kye* (Korea), and *hui* (Central China).

<sup>3</sup> For a noteworthy exception, see Besley, Coate, and Loury (1990).

<sup>4</sup> Big Babanki is a small chiefdom in the North West Province, 30 kilometers north of Bamenda, the provincial capital. It lies in the hilly, savannah region known as the Grassfields of West Cameroon. Coffee is the main cash crop for men, while the production and marketing of food crops, dominated by women, was rapidly becoming an important sector of the economy.

<sup>5</sup> Some of the data collected were part of a replication effort of an earlier survey conducted in 1970 and published in Bouman and Hartevelt (1976). The same questionnaire was used again in 1979 to interview a sample of 46 members in the same ROSCAs – if these were still functional. Some comparisons between the two points in time could be made with respect to the functioning of the ROSCAs in a changing economic environment. The survey information provided a case study for the empirical investigation of the functioning of ROSCAs (van den Brink 1980).

## 2. WHAT IS A ROSCA?

The ROSCA is an association of men and/or women that meets at regular intervals, for instance once a month, and distributes a lump sum of money to one of its members. The fund is made up of the variable or fixed contributions of each member of the association. It is, in turn, given as a whole to each member of the association. For instance, ten individuals meet every month and each pays 10 dollars into a pool. Thus, each month there is 100 dollars in the pool. This is then handed over to one of the members. In the next month they again pay 10 dollars each and a different member of the group receives the money, and so on until every member has had his or her turn. This is the basic structure of rotating savings and credit associations. No interest calculations are made.

However, the ROSCA as it can be found in the Grassfields of Cameroon is closely associated with a *second* economic institution operating in parallel, which *does* charge interest on its transactions. It is called the meeting, or *trouble bank*.<sup>6</sup> The trouble bank operates within the ROSCA and can be described as a *terminating fixed fund association*.<sup>7</sup> It is basically a small bank from which the members can borrow at a fixed interest rate. All members, aside from their variable or fixed contributions to the ROSCA, also subscribe to this other fund. The accumulated fund is used to give loans to members of the association at an interest rate of 50 CFAF per month per 1,000 CFAF, i.e., 5 percent per month on the principal, which implies an annual interest rate of 60 percent. In the trouble bank, a credit ceiling exists related to the average subscription. Members can take several loans during a cycle, provided old debts are settled first. The subscriptions are usually fixed at a certain level, although the first contribution is generally higher than the regular subscriptions in order to establish a sizeable initial fund for loans.<sup>8</sup>

---

<sup>6</sup> Although the people of the village routinely use the word "meeting," I will replace it by "trouble bank" to avoid confusion. In South Africa these associations are called *stokfels*. Elsewhere, they are also known as "Christmas clubs," since, as was the case in Cameroon, these trouble banks are often liquidated in December.

<sup>7</sup> Fixed fund associations, such as the meeting or trouble bank, are also frequently used outside the institutional context of the ROSCA. For instance, the local branch of the national political party, uses a fixed fund association to distribute party membership cards, obligatory for every Cameroonian citizen. Fixed fund associations are also used by tax collectors. Most popular, however, are the associations among women: membership may easily reach 50 to 100 persons.

<sup>8</sup> This is called "fixing the chair."



After completion of a full ROSCA cycle, the trouble bank is also terminated. The members receive back their accumulated savings plus an equal share of the collected interests. Out of the total sum of interest payments collected, the secretary, banker, and assistant are paid their fees. As with any other bank, interest payments cover dividends and overhead costs. Interest on savings might be about 15 to 25 percent per year, since not all savings are mobilized for credit purposes. Because borrowers also receive their share of dividends at the end of the cycle, they typically borrow against an effective interest rate (interest paid on loans minus dividends received at the end of the cycle) of 25 to 30 percent.<sup>9</sup> We shall return to the relation between trouble bank and the ROSCA at a later point.

The ROSCA and the trouble bank have the following division of responsibilities. The leader of the association and the one who hosts its meetings is called the *landlord*<sup>10</sup> or president. Several *bankers* are involved in monitoring the various transactions of the ROSCA and in the safekeeping of surplus funds of the trouble bank. An *assistant* is appointed to implement certain decisions made by the landlord. Subscriptions are recorded by a *secretary*.<sup>11</sup> The president can impose a number of fines in order to enforce the rules of the ROSCA. Tardiness, making "palaver" at important moments in the proceedings, and any irregularities in payments are all liable to immediate fines. The accumulated fines are kept by a banker and are usually allocated to the landlord at the end of the cycle.

---

<sup>9</sup> Such data are easily obtained from the *njangeh* records kept by the secretary.

<sup>10</sup> One should not associate this with the Asian stereotype. The term *landlord* is simply used to identify the president of the association and the one who owns the compound where the meetings of the *njangeh* are held.

<sup>11</sup> The existence of written records on the operations of the ROSCA and the trouble bank greatly facilitates research into the ROSCA and, by extension, into developments in the wider village economy.

### 3. MICROECONOMIC FOUNDATIONS

If we examine the ROSCA system more closely, we realize that all members of the group (apart from the one who receives the money last) receive an advance that they repay through their contributions during the cycle. The first member to collect the monthly fund – rank one in the order of rotation – receives the maximum credit that he or she pays back in monthly installments during the cycle. The last member – say, rank  $N$  – receives no credit and saves throughout the cycle, while recovering his or her savings at the end. Thus, credit  $C$  is reduced in the same measure as the cycle progresses, according to the formula below. For an individual with rank  $j$ , we can calculate the "net" credit or loan  $L$  as follows:

$$L = C_j - S_j \quad (1)$$

$$C_j = c(N - j)$$

$$S_j = tj$$

where:

- $N$  = number of members, i.e., total number of times the fund is allocated;
- $c$  = fixed periodical contribution per member;
- $j$  = rank of recipient of fund in order of rotation (i.e., number of times fund has been allocated previously);
- $C_j$  = credit extended to recipient of fund; and
- $S_j$  = savings made up to period  $j$ .

In general, then, net credit  $L$  is unequally distributed over the members, depending on their rank in the order of the fund's rotation. The first half of the membership will have a positive  $L$  value, whereas the latter half will have a negative  $L$  value. Thus, the first half of the membership are "net creditors," and the last half are "net savers."

Interest is not charged with respect to the rotation order of the fund. In the Cameroon village studied here, the order of rotation was fixed in advance, and the first person in the cycle received an interest-free loan that he or she then paid back in monthly installments. The last person saved throughout the cycle and received his accumulated savings at the end of it, but without any compensation in the form of interest. Several types of interest mechanisms may be found elsewhere, one of which consists of auctioning the fund to the highest bidder (e.g., Penny 1968).

How and why did the people in the village think the institution of ROSCA evolved? What is the economic rationale behind this scheme? One story on the origin of *njangeh*:

*Njangeh* was a thing invented by a father to help his sons. Imagine he had three sons and he wanted them to have wives. How would he get each of them his bride price? He would urge his sons to work hard: dig stones, heat them and make cutlasses and other things. The father saved the money thus earned, and when he had enough money he gave it to the oldest son so that he could marry. This one could now start a family but would continue working so that eventually the second brother could buy a wife. And so on. In this way everybody could raise the bride price, because one man would have the others working for him if it was his time to marry. The father would be a proud man if none of his sons were lazy and worked hard to help his brothers.

Whether the marriage story is actually true is not important.<sup>12</sup> However, the story does contain the crucial themes that can help us understand to which specific economic problem the rotating savings and credit institution was a solution. The first theme is related to the fact that the three brothers all needed to accomplish a goal that required a relatively large amount of cash or labor. The raising of a bride price, but also the building of a house or the clearing of a field, are examples of such goals. This problem is a variation on the economic problem of indivisible goods. Individual preferences for certain indivisible goods within a context of high marginal utility for current consumption have also been called the *lumpiness* problem. ROSCAs provide a Pareto-superior answer to this problem if the only alternative is for individuals to each save individually for the indivisible good. The lumpiness problem of each individual can be sequentially solved, shortening the waiting period for all but the last person who is indifferent between the ROSCA and individually saving (see also Besley et al. 1990, 4). In the above example, the expected waiting period for the "average" son became strictly shorter. The creation of the "rotating bride price association" is Pareto-superior. The fact that the three brothers had different temporal preferences for the indivisible good (i.e., marriage) made an even stronger argument to create a ROSCA. In the above bride price case, then, the lumpiness problem created an intertemporal contracting opportunity.

The above discussion sheds some light on the rationale of ROSCA. It also raises several important questions. Firstly, what if other alternatives are open to the brothers, besides individually saving without receiving interest? What if they can take their money to a bank and receive interest on their savings? Alternatively, what about the possibility of privately borrowing money against interest?

---

<sup>12</sup> However, after a search of historical data (including the results of a nine-month survey undertaken by a British Assistant District Officer in 1933), Nwabughogu (1984) concludes that the story actually happened in Ngwaland in Nigeria.

Assuming  $N$  individuals who each consider obtaining an indivisible good  $B$ , the option open to the individuals is to collectively organize a ROSCA that will have a rotating fund sufficient to buy  $B$ . In a ROSCA,  $N$  constitutes the number of periods as well as the number of individuals. Each period another member obtains the indivisible good  $B$ . If the indivisible good  $B$  yields a benefit  $b$  in each period once an individual  $j$  has obtained it, then the individual to obtain the pot  $B$  in the ROSCA at time  $j$  has the following net benefit in period  $t$ :

$$Y_{jt} \begin{cases} = w - c & \text{for } t < j \\ = w - c + b & \text{for } t \geq j \end{cases} \quad (2)$$

where  $c$  is the periodic contribution to the ROSCA, and  $w$  represents exogenous income which each individual obtains in each period  $i$  ( $w > c$ ). An implicit discount rate of zero is assumed.<sup>13</sup> Then, net benefit to the first individual ( $j = 1$ ) is measured by adding over all  $N$  periods, and equal to:

$$\sum_{i=1}^N Y_{1i} = N(w-t+b) = N(w-t) + Nb. \quad (3)$$

The last person in the ROSCA cycle ( $j = N$ ) only benefits from  $B$  in the last period. Thus, his/her total net benefit over the full cycle is given by:

$$\sum_{i=1}^N Y_{Ni} = (N-1)(w-t) + (w-t+b) = N(w-t) + b. \quad (4)$$

---

<sup>13</sup> The assumption of a zero discount rate is rather restrictive. However, it greatly simplifies the discussion. For that reason, a zero discount rate will be assumed in the text. The results presented below can be easily extended to reflect a positive discount rate. This will be handled in the footnotes.

If  $j$  is the rank of the person in the cycle where  $1 \leq j \leq N$ , then the total net benefit to an individual with rank  $j$  is given by:<sup>14</sup>

$$N(w - t) + (N - j + 1)b. \quad (5)$$

It follows that per capita net benefit from the ROSCA is:

$$\frac{1}{N} \sum_{j=1}^N N(w - t) + (N - j + 1)b \quad (6)$$

which reduces to

$$Nw - B + \frac{(N + 1)}{2} b \quad (7)$$

since

$$\sum_{j=1}^N j = \frac{N(N + 1)}{2}; \quad t = \frac{B}{N}.$$

This formula consists of two basic parts: the first part is the sum over  $N$  periods and  $N$  individuals of the term  $w$  minus the cost of the acquisition of  $B$

---

<sup>14</sup> In the case where the  $j$ th individual has a positive rate of time preference, the present value of net benefit to the  $j$ th individual is

$$\sum_{t=1}^N \alpha^t (w - c) + \sum_{t=j}^N \alpha^t b = \left( \frac{\alpha - \alpha^{N+1}}{1 - \alpha} \right) (w - c) + \left( \frac{\alpha^j - \alpha^{N+1}}{1 - \alpha} \right) b$$

where  $\alpha = \frac{1}{1 + R}$ ,  $R$  being the discount rate,  $R > 0$ . This implies that the present value of the per capita net benefit from the ROSCA is

$$\begin{aligned} \left( \frac{\alpha - \alpha^{N+1}}{1 - \alpha} \right) (w - c) + \sum_{j=1}^N \left( \frac{\alpha^j - \alpha^{N+1}}{1 - \alpha} \right) \frac{b}{N} &= \left( \frac{\alpha - \alpha^{N+1}}{1 - \alpha} \right) (w - c) \\ &+ \frac{\alpha - \alpha^{N+1}}{(1 - \alpha)^2} \frac{b}{N} - \frac{\alpha^{N+1}}{1 - \alpha} b. \end{aligned}$$

for the  $N$  members. The second part can be interpreted in several ways. The most obvious interpretation is that the average ROSCA member acquires  $B$  in about half the time it would take him or her to save for  $B$  on his or her own. The term also points out that approximately half of the members obtain a positive net credit through participation in the ROSCA.

Until now we have implicitly assumed that the alternative to the ROSCA was the individual saving of money without receiving interest income on the accumulated savings. Under what conditions is participation in a ROSCA more advantageous to the individual than participation in an interest-bearing savings account, such as provided by the Credit Union (also present in the village)? Consider the case where an individual saves  $\$C$  per period and receives an interest on the savings account. For simplicity, we assume that interest is paid each period (i.e., no compound interest calculations are applied). The total net benefit of such saving for an individual over  $N$  periods is given by:<sup>15</sup>

$$N(w - c) + \sum_{j=1}^N jrc = N(w - c) + N \frac{(N + 1)}{2} rc. \quad (8)$$

We now evaluate the benefits of the "average" ROSCA member (someone with a rank  $j$  exactly in the middle of the cycle) with the benefits of saving against an interest rate  $r$  in the Credit Union. One could also look at this problem in terms of the ex ante benefits of participation if one assumes that the rank an individual gets in the ROSCA is allocated at random, so that the benefits of the average ROSCA member are in fact the expected benefit of any individual prior to the establishment of the rank order. Choosing between the ROSCA and the Credit Union, the individual chooses the ROSCA if and only if:

$$N(w - c) + \frac{(N + 1)}{2} b > N(w - c) + N \frac{(N + 1)}{2} rc.$$

---

<sup>15</sup> In the case of a positive rate of time preference, the net present value of net benefit of saving is

$$\sum_{j=1}^N \alpha^j (w - c) + \sum_{j=1}^N \alpha^j rjc = \left( \frac{\alpha - \alpha^{N+1}}{1 - \alpha} \right) (w - c) + \left( \frac{\alpha - (N + 1) \alpha^{N+1} + N \alpha^{N+2}}{(1 - \alpha)^2} \right) rc$$

where  $\alpha = \frac{1}{1 + R}$ ,  $R > 0$  being the discount rate.

Since we know that by definition  $c = B/N$ , this reduces to:<sup>16</sup>

$$b > rB. \quad (9)$$

Thus, the periodic benefits  $b$  of the indivisible good  $B$  need to be sufficiently large in relation to the interest rate on savings. The interest rate on savings establishes a lower bound on  $b$ . If  $b$  is below the periodic opportunity cost of the fund  $B$  valued at the interest rate  $r$ , the "average" individual will decide not to join a ROSCA, but will rather join the Credit Union. However, if  $b > rB$ , it means that there are positive benefits from participation in the ROSCA. In other words, if  $b > rB$ , the ROSCA is superior to participating in an interest-bearing savings account: the "average" individual can be made strictly better off by joining a ROSCA. Interest rates on savings in formal savings institutions in most less developed countries tend to be quite low. Equation (9) thus indicates that, on the average, the existence of indivisible goods can provide a motivation for the existence of a ROSCA. In that sense, we can interpret any participation in a ROSCA as indirect evidence that  $b$  is in general above the opportunity cost of saving in liquid assets,  $rB$ . Result (9) should be interpreted with caution. It does *not* imply that *every* ROSCA member would always prefer a ROSCA to a savings account. In other words, there is a potential problem of adverse selection for the ROSCA: the last individuals to receive the pot have less incentive to participate in the scheme than the first individuals. Solving this problem will require rules that minimize asymmetry information and the incentive to "free-ride" in the ROSCA. These issues will be discussed in some detail below.

The next case is the loan alternative. What if the individual can take a loan to obtain  $B$  in period 1 and receive benefits  $b$  each period,  $t = 1, \dots, N$ ? Let us formulate the following loan repayment schedule: repayments in every period are equal to a fixed portion of the principal sum (i.e.,  $B/N$ ), interest payments are due starting in the second period and are calculated as a function

---

<sup>16</sup> In the case of a positive discount rate, equation (9) becomes

$$\left( \frac{\alpha - \alpha^{N+1}}{1 - \alpha} \right) (w - c) + \frac{\alpha - \alpha^{N+1}}{(1 - \alpha)^2} \frac{b}{N} - \frac{\alpha^{N+1}}{1 - \alpha} b > \left( \frac{\alpha - \alpha^{N+1}}{1 - \alpha} \right) (w - c) + \left( \frac{\alpha - (N + 1) \alpha^{N+1} + N \alpha^{N+2}}{(1 - \alpha)^2} \right) r c$$

or

$$b > \frac{[1 - (N + 1) \alpha^N + N \alpha^{N+1}]}{1 - \alpha^N [1 + N (1 - \alpha)]} rB.$$

of the original loan amount.<sup>17</sup> Thus, total repayments will equal  $B + i(N - 1)B$ , where  $i$  is the interest rate on credit.<sup>18</sup> To establish the conditions for the "average" individual to prefer the ROSCA to the contracting of a private loan, we need to evaluate the following inequality:

$$N(w - c) + \frac{(N + 1)}{2} b > N(w + b) - B - i(N - 1)B \quad (10)$$

which, given  $B = Nc$ , reduces to the following condition:<sup>19</sup>

$$b < 2iB. \quad (11)$$

---

<sup>17</sup> This is in fact the method employed in the trouble bank.

<sup>18</sup> In the case of a positive discount rate ( $R > 0$ ), the net present value of a loan is

$$\sum_{j=1}^N \alpha^j (w + b) - \sum_{j=2}^N \alpha^j \left[ iB + \frac{B}{N - 1} \right] - \left( \frac{\alpha - \alpha^{N+1}}{1 - \alpha} \right) (w + b) - \left( \frac{\alpha^2 - \alpha^{N+1}}{1 - \alpha} \right) \left( iB + \frac{B}{N - 1} \right)$$

where  $\alpha = \frac{1}{1 + R}$  and the individual is assumed to repay  $\left( \frac{B}{N - 1} + iB \right)$  each period for  $j = 2, \dots, N$ .

<sup>19</sup> In the case of a positive discount rate, equation (10) becomes

$$\left( \frac{\alpha - \alpha^{N+1}}{1 - \alpha} \right) (w - c) + \frac{\alpha - \alpha^{N+1}}{(1 - \alpha)^2} \frac{b}{N} - \frac{\alpha^{N+1}}{1 - \alpha} b > \left( \frac{\alpha - \alpha^{N+1}}{1 - \alpha} \right) (w + b) - \left( \frac{\alpha^2 - \alpha^{N+1}}{1 - \alpha} \right) \left( iB + \frac{B}{N - 1} \right)$$

or

$$b < \frac{(\alpha - \alpha^N) \left( i + \frac{1}{N - 1} \right) - \left( \frac{1 - \alpha^N}{N} \right)}{1 - \alpha^N - \frac{1 - \alpha^N}{N(1 - \alpha)} + \alpha^N} B.$$



The existence of the credit alternative thus establishes an upper bound on the benefits  $b$  of the indivisible good  $B$ . Only if the benefits  $b$  of the indivisible good  $B$  are larger than  $2iB$  would the average individual prefer to contract a loan against interest  $i$  so that he or she can immediately profit from  $B$ . The attractiveness of the ROSCA compared with a private credit source would exist when  $b$  is smaller than  $2iB$ . Given the fact that interest rates  $i$  for private moneylending can be quite high, we will interpret any participation in a ROSCA as indirect evidence that  $b$  is, in general, less than  $2iB$ .

It should be emphasized that the result (11) holds only for an "average" individual. As such, (11) should be interpreted with caution. In particular, it does not imply that every ROSCA member would always prefer a ROSCA to a loan, thus raising the issue of possible adverse selection for a ROSCA. The issues of information and possible adverse incentives associated with a ROSCA will be discussed in some detail below.

In summary, we have established the existence of a specific range for the benefits  $b$  associated with the indivisible good  $B$ . If  $b$  falls within this range, it would be profitable for the average individual to participate in a ROSCA.

$$rB < b < 2iB. \quad (12)$$

The bounds of the ROSCA-relevant range are a function of the opportunity costs of saving and the opportunity costs of credit. It would seem that empirically such a range can be quite large in developing economies, given the generally low interest rates on savings and the high interest rates charged by private moneylenders.

The marriage story in the beginning of this section illustrated that such conditions apparently existed for the three brothers. The fact that they were presumably operating in a non-monetized economy in which labor was the "currency" does not change the above argument. Conceivably, it would still have been possible to "save" labor by investing it in other projects, whereas it may have also been possible to acquire labor "on credit." The important point is that there existed microeconomic benefits to the collective action of the brothers that resulted in the creation of an economic institution, viz. a type of rotating association, in which benefits were rotated among the members. The more generic forms of rotating associations in sub-Saharan Africa are the well-known rotating labor associations.<sup>20</sup> These also existed in the particular village studied and

---

<sup>20</sup> In a historical study of ROSCAs among the Ngwa Igbo of Nigeria, Nwabughuogu (1984) confirms the hypothesis that ROSCAs were merely a monetary variation on a principle that had already proven its economic worth, i.e., the rotating labor association.

were employed for the clearing of coffee farms or certain weeding operations.<sup>21</sup> *Death aid societies* provide another example of rotating associations.<sup>22</sup> The rotating "bride price" association, the rotating labor association, the death aid societies, and the ROSCA are institutional variants of the same principle.<sup>23</sup> They are economic institutions that define unconditional contracts for the solution of the lumpiness problem following a pattern of exactly specified reciprocity. However, the microeconomic incentive that existed in the case of the three brothers was only one condition for the establishment of the ROSCA. The other condition was the existence of an appropriate monitor, viz. the father. This authority figure provided the institutional management that could enforce the contract the three brothers were willing make. In other words, the contract was enforced in an institutional setting that minimized the risk and transactions costs associated with contracting in an uncertain environment (e.g., moral hazard and adverse selection).

---

<sup>21</sup> Note that the problems of clearing and even of weeding can be sequentially solved. However, one would not expect to find a rotating labor association with respect to, for instance, planting operations, which have a narrow window of opportunity.

<sup>22</sup> In death aid societies part of the fund needed to organize the elaborate final farewell to the deceased is provided by the guests themselves. Donations are recorded so that the hosts will be able to reciprocate at a future date, i.e., the occurrence of a death in the guests' families.

<sup>23</sup> ROSCAs may also be created for temporary "lumpiness" problems. For instance, it has been reported in Swaziland that in 1984 many ROSCAs started after the ravages of a cyclone forced many households to finance the rebuilding of their homes.

#### 4. MINIMIZING RISK AND TRANSACTION COSTS

The marriage story pointed to the need for an authority figure who could ensure that the money was handled fairly and who had the power to inflict punishment. How exactly does the ROSCA enforce its contracts and, more specifically, how does it handle the risk of default? Or, in the symbolism of the marriage story, how is the older brother, once married, prevented from running away with his wife without paying his brothers?

The person responsible for the overall efficiency of the operation of the ROSCA is the president. He or she has several risk-reducing mechanisms at his or her disposal. For instance, risk can be reduced ex ante by carefully matching the average level of contributions with the repayment capacity of its membership. Thus, members can be selected in terms of quantity and "quality" – the level of individual contributions. In this respect, we observed a trade-off between quantity and quality: the greater the contributions in an association, the fewer its members (see Table 1). Of the 30 ROSCAs with an average contribution per member of less than 3,500 CFAF, 25 had more than 15 members. Membership ranged from approximately 40 in the "poor" ROSCAs to 10 in the "richest."

Careful matching is typically undertaken between the evaluation of a particular individual's repayment capacity and his/her rank in the order of rotation. The amount of credit an individual is accorded varies directly with the rank in the cycle. Thus, under a system of fixed contributions, the first member in the cycle receives the maximum credit, while the last member receives no credit at all. Intermediate positions cover intermediate amounts of credit. At a zero discount rate, half of the membership is a net borrower, whereas the other half is a net saver. An order of rotation, then, essentially equals a list of chronologically ordered loan applications of varying magnitudes. It is up to the president of the ROSCA to establish an order of rotation to balance the individual preferences against the objective of overall reduction of the risk of default.

Although some individuals prefer to be in the later positions given their temporal liquidity preferences, the earlier positions are, in general, the "better" positions. Conversely, the later positions would, in general, be considered less advantageous. If only one ROSCA cycle would be undertaken – i.e., if the ROSCA was played as a one-shot game – individuals who ended up at the end of the order of rotation would then have an incentive to drop out of the ROSCA ex post, after the rotation order had been established. It is useful at this point to draw a parallel between the ROSCA's order of rotation and the establishment of a "credit line" as found on a regular credit card. Without a credit history, individuals may be asked to collateralize the credit line by first depositing money in a savings account. Proper use of the credit card will

**Table 1** – Cameroon: Number of ROSCAs, by Average Contribution and Membership, Big Babanki, 1980

	<b>Less Than 3,500 CFA</b>	<b>3,500 CFA and Over</b>	<b>Total</b>
Less than 15 members	5 (11.9)	9 (21.4)	14 (33.3)
15 members and over	25 (59.5)	3 (7.1)	28 (66.7)
<b>Total</b>	<b>30 (71.4)</b>	<b>12 (28.6)</b>	<b>42 (100.0)</b>

**Note:** Percentages are given in parentheses.

establish a good credit history, after which the collateral constraint is relaxed and the credit line gradually increased. Advancement in the order of rotation of the ROSCA functions along the same lines. Provided the individual proves to be a good member, he or she can move up in the order and increase the amount of credit obtained. In other words, ROSCAs are not played as one-shot games; they are repeated games in which net benefits should be calculated over more than one period.

In ROSCAs where the contributions are not fixed, individual members can directly control the amount of credit accorded to a particular individual. In fact, in the particular village under study, most ROSCAs had a system of variable contributions subject to a certain minimum floor. Thus, under the rule of variable contributions, the exact amount of credit that one person extends to another person is individually controlled. Now each individual can evaluate subjectively another's repayment capacity, taking into account past experience, stated intentions, and the latest available information about the person's credit rating. Variable contributions also allow, to an extent that varies with the rank in the cycle, the individual to control the size of his or her own savings.

The crucial role that the order of rotation plays with respect to risk reduction is borne out by the fact that newer members are generally placed in the last positions.<sup>24</sup> These positions pose the least risk; if a person in one of the last positions fails to repay after having taken the fund, only the few members coming after him or her who have not yet taken the fund will be affected. The ROSCA, then, has the option of putting risky debtors last in the cycle. The order of rotation is perhaps the most powerful, and flexible, management tool that the president employs to screen potential borrowers.

The order of rotation is not always established ahead of time. Individuals may bargain during the cycle over the next allocation of the fund. This introduces some flexibility to the system, as the rankings can be adjusted to new information, but it also introduces the possibility of strategic behavior. It should be stressed that the institutional setup of the ROSCA does not easily lend itself for insurance purposes. For instance, a considerable number of income shocks in the village are covariant: all villagers are somewhat affected by these shocks at the same time (e.g., droughts, insect infestations, etc.). Additionally, if an individual could at all times successfully plead and bargain for the ROSCA fund to insure against immediate calamities, moral hazard would increase. However, as we will argue below, this opportunism is exactly what the ROSCA tries to escape. This explains why an individual plea to change the order of rotation while a cycle is already under way usually stirs heated debates. The fact that the mechanism of bidding for the fund does not seem to be widespread in the literature on ROSCAs in Africa may also be related to problems of moral hazard and adverse selection. Bidding could create a situation in which those who are most desperate for money acquire the fund, which may lead to a higher

---

<sup>24</sup> This is a general rule in many ROSCAs in West Africa. The same mechanism was observed in Mexico with respect to the functioning of the *tanda* (Kurtz and Showman 1977).

risk of default for the institution. In other words, riskiness would increase through self-selection.

The president ultimately decides on the order of rotation. The president is typically a man or a woman with expert knowledge about the current and potential members of his or her ROSCA. More than by business acumen, presidents are characterized by authority, prestige, and respect. Moreover, presidents are almost never full-time traders who would be absent for long periods from the village. By virtue of their social position, they are likely to be expert judges of a man or woman's integrity and economic capacity. Such information is used to establish accurate credit ratings of the individual members.

However, the problem of monitoring the monitor is only partly solved by relying on the president's interests and social reputation. The ROSCA has created a simple but effective incentive mechanism to ensure a president's dedication to risk management within the ROSCA: *the president always takes the last position*, that is, the position in which an individual only saves and no credit is accorded. He or she can never escape "punishment" if any one member defaults. Management is directly evaluated on loan performance. Consequently, the ROSCA attempts to solve the problem by a direct application of the theory of the firm (Alchian and Demsetz 1972). The person responsible for monitoring the ROSCA (the president) is made the residual claimant. The problem of "who monitors the monitor" is solved.<sup>25</sup>

So far, we have mainly discussed ex ante risk reduction measures. How does the ROSCA deal with ex post risk? What if, in spite of all the above ex ante risk minimization mechanisms, somebody shows up at the ROSCA without money?

Most commonly, a member who cannot meet the required contributions to the ROSCA has the opportunity to borrow from the trouble bank.<sup>26</sup> Apart from giving its members access to a short credit line independently of the ROSCA, *the trouble bank collateralizes part of the transactions of the ROSCA*. Given the size of the

---

<sup>25</sup> Of course, this leaves the president only with the benefits of personal prestige and social reputation. This reputation can, however, easily be used to gain entry to other ROSCAs. Moreover, we found several ROSCAs in which a fictitious "brother" or "wife" of the president was put in the first position, compensating the president for the last position.

<sup>26</sup> It should be noted that the ROSCA and the trouble bank are often confused with each other. These are two separate institutions which, however, can easily be combined to create a private, interest-charging banking system. For instance, in Nigeria private moneylenders would organize a ROSCA or associate themselves with existing ROSCAs in order to facilitate the repayment of high interest-bearing loans by debtors. Considerable financial wealth was accumulated by these middlemen, and this system damaged the reputation of the ROSCA (see Nwabughuogu 1984). However, it should be noted that the ROSCA in this case was merely part of a tied loan system exploited by financial middlemen to enforce the strict repayment of loans.

ROSCA fund in relation to the levels of subscriptions and the loan ceilings in the trouble bank, however, it is obvious that the trouble bank cannot perfectly collateralize the ROSCA operations. Ultimately, the ROSCA may have to face outright default by one of its members, although no such event took place during the survey period of six months. When somebody was asked what his ROSCA would do to a man unable to contribute after taking the fund, he said, "We will take him to Bamenda<sup>27</sup> for execution!" After which he broke out in laughter. This is what another informant told us on the subject:

No society lacks those who cannot contribute. A man who fails to contribute to the njangeh, can postpone it. If you haven't paid by the next month, people will go tired. Of course you can go to the quarterhead or to the traditional court, but if the man simply hasn't got the money, you will just hear that, and that is all. Besides, you have to pay the quarterhead and the court: do you compensate them for nothing? Only a fool would do that. In town, people take property out of the man's house, but here in the village, we don't do that, we say: "ashia for our money" and forget it. Another njangeh can take the man, and if he changes his fashion, all the better.

Thus, while social pressure is certainly great, people do keep a sharp eye on the transactions costs involved in enforcing repayment. They put limits on how far they will go to get their money back. Costs of loan recovery will at some point outweigh the potential benefits.

Defaulting comes in phases and in gradations. The worst default is to be unable to contribute after one has already taken the fund. This is theft. A milder form of default is to be unable to contribute before one's turn has come. This reduces the size of the fund for the members yet to take the fund. The majority of those interviewed stated that they had never experienced default of the first kind, but default of the second kind is more common. Additionally, defaulters of the first kind rarely stay in default for long. Various arrangements and promises can postpone the repayment, sometimes for years.<sup>28</sup> Thus, when informants said that defaulting was rare or almost absent, they meant that theft, in the form of infinitely rescheduled debt, was very rare.<sup>29</sup> On the other hand, people are not exactly acquiescent with respect to any kind of default. They see it for what it is: an undermining of the institution. Default challenges the very principles on which the success of the operation is

---

<sup>27</sup> Bamenda is the capital of the North West Province of Cameroon.

<sup>28</sup> Someone who had defaulted went to the plantations in the South West Province, and when he returned ten years later, paid all his contributors, including the fines he had been charged, and was readmitted as a ROSCA member again.

<sup>29</sup> The attitude in the village with respect to common thievery can be disastrous for the thief: if he values his life his best bet is to run to the nearest police station and beg to be put safely behind bars.

based. If bad luck befalls one outside the ROSCA, one may plead and bargain. However, inside the ROSCA there are no excuses. This is why the villagers claim that "not even death is an excuse": the heir will automatically be responsible for repayment. Ex post, then, the opportunity for strategic behavior is limited.

Ultimately, the unconditional contracts of the ROSCA are enforced by the threat of sanctions emanating from the wider structure of conditional contracting, which characterizes the economy within which the ROSCA is embedded. The mechanism operating to minimize the residual risk of default is social ostracism and peer pressure. The costs of social ostracism within a networking economy are by definition considerable: the individual is declared morally, socially, and economically bankrupt.

As long as the net benefits of defaulting and becoming a social outcast are strictly less than the benefits of paying and enjoying the future benefits of the ROSCA and the wider network, ROSCA members will not choose to default ex ante. If this condition holds, the ROSCA agreements become self-enforcing even in the absence of legally binding contracts along the arguments of a repeated Prisoner's Dilemma (Friedman 1986). However, in the rare case that a significant downward income shock indeed rules out the possibility for the individual to live up to the terms of the contract, the ROSCA has no alternative but to accept the loss.



## 5. COMPARATIVE INSTITUTIONAL PERFORMANCE: EMPIRICAL EVIDENCE

How well does the ROSCA system perform compared with other forms of financial mediation in the village? For instance, how important is the ROSCA in terms of membership? For 1979, the estimation was that, out of a total population of 3,355, 95 percent of all household heads were members of ROSCA (van den Brink 1980). This estimate was confirmed by the subchiefs of the tribe, who gave a lower limit of 90 percent. Thus, we can safely say that at least 90 percent of all household heads was a member of ROSCA.

Many ROSCAs had mixed male/female memberships. Thus, women with income sources comparable to those of male heads of households (farming, trading, handicrafts, etc.) showed a similar pattern of membership in the ROSCA system. Moreover, most adult women in the village were members of one or more of the many specialized trouble banks, i.e., the terminating fixed fund associations.<sup>30</sup>

What is the relative financial importance of the ROSCA system for the village? The system has a turnover of about 74,000 dollars annually, given out in approximately 650 loans. This is a substantial amount by any standards. If we take a 200 dollars per capita income, which is a generous estimate, it would mean that the ROSCA system mobilizes 11 percent of village income. If we add to this the amount of savings accumulated in the numerous trouble banks, the indigenous credit sector seems to be doing a good job in mobilizing savings and extending credit. Moreover, in the ROSCA, savings are immediately and locally transformed into credit. If we feel that the transformation of savings into credit, i.e., mobilization followed by immediate reinvestment, should be an indication of efficiency, the ROSCA performs very well.

At the same time, the system allows for individual mobility with respect to credit: within a particular ROSCA, an individual can gradually advance in the

---

<sup>30</sup> It is sometimes argued that women have differential access to credit "because women generally do not own marketable land rights and, as subordinates in the household, cannot establish independent reputations for creditworthiness" (World Bank 1990, 5). It is true that the traditional property rights system generally accords women only cultivation rights for annual crops, which do not easily transform into more permanent property titles. However, given the property rights regime in place, most men do not possess marketable land rights either: this does not prevent them from establishing their creditworthiness in the ROSCA system. Additionally, there hardly seems to be any relation between a husband's creditworthiness and that of his wife. The ROSCAs and trouble banks provide women with ample opportunity to establish their own credit rating, irrespective of that of their husbands.

rotational order and increase his/her credit line, matching repayment capacity with rank order. Mobility is also common between ROSCAs. Thus, whereas the distinction between net savers and net debtors within one cycle seems to distribute the benefits of the ROSCA unequally over its membership, such inequality is reduced in the long run through the opportunity given to the individual to advance in the order of rotation. In other words, the ROSCA forces some individuals to save for the benefit of others, while collecting information for the benefit of the group. From the viewpoint of the individual, starting out in the later positions is an investment in one's credit record.

A person can hold several memberships at any time. Moreover, even if an individual cannot afford the contributions to a certain ROSCA, he or she can share a membership with another person. Individual mobility has important distributional implications. Such mobility is often constrained in the case of collateralized lending against physical assets. There the problem for the borrower is either how to get the first loan or how to prevent asset sale in the case of an exogenous income shock. In imperfect credit markets, initial, discrete asset distribution can exclude individuals structurally from credit opportunities.

The default risks of private moneylending – a type of single-stranded market relation – within the context of a networking economy, a multistranded setting – are probably a major reason for the development of the ROSCA institution. Related to the issue of substitution of payments for side payments within the networking economy is the problem of information and enforcement. It is difficult for the individual parties to assess where insurance stops and opportunism begins.<sup>31</sup> With respect to private moneylending, then, imperfect information and transaction costs seem to be important sources of comparative inefficiency. Consequently, interest rates outside of economic institutions, such as the ROSCA or the trouble banks, are highly variable and consistently high in many parts of Africa (Miracle et al. 1980).<sup>32</sup>

---

<sup>31</sup> In litigation cases in the traditional courts, such dilemmas surface explicitly. It is very difficult for the traditional justice system to differentiate the credit relation between the two parties from the other strands of their relationship. Interpretation problems quickly arise, and the final ruling may leave both parties dissatisfied.

<sup>32</sup> However, the mere citing of an interest rate out of its context can be misleading. Many of the examples of "exorbitant" rates given in the literature are not interest rates of explicit, unconditional credit contracts. They may be implied interest rates that are part of a more general implicit contract between the two parties. Typically, business contracts are set up as joint ventures in which each of the two parties contributes certain inputs while profits are shared according to a particular formula. Such contracts are essentially a type of sharecropping contract. The question then becomes whether the fact that the creditor receives profit shares is an example of "exorbitant" interest rates or rather an example of a particular type of risk-sharing arrangement which provides incentive mechanisms in a context of imperfect information and uncertainty.

The following example will point to some of the implications. Before the harvesting of coffee, a number of traders buy coffee "on the tree." The farmer mortgages the standing crop in exchange for credit.<sup>33</sup> To the farmer involved it is a welcome source of cash in the preharvest period. However, many farmers do not repay their loan, i.e., fail to deliver the specified amount of coffee after harvest. To understand this attitude and to explain why traders continue to make such loans, one has to look more closely at the wider implicit contract and the nature of the payments involved.

The relationship between the trader and the farmer is basically of the generalized reciprocity kind. It is a multistranded relationship. The trader may in fact receive payments in the form of a certain political allegiance or a range of small services, i.e., side payments. Consequently, a point may be reached at which the farmer considers the debt as repaid. Neither of the two parties may question this arrangement. In fact, traders are well aware of the more narrow default risks of getting their money back, instead of side payments. One trader estimated this "default risk" as a 50 percent chance of getting his money back.

The above example clarifies why individuals are hesitant to enter into person-to-person, cash-credit transactions. The risk of explicit defaulting induced by the implicit contracting of the wider social structure may be considered too high. The possibility that the other party will substitute cash repayment for services, allegiance, or patronage might be unacceptable to the individual. Private moneylenders – i.e., individuals who deal strictly in money – are not present in the village. Enforcement of such contracts can be costly. This suggests that an induced demand for an alternative economic institution exists, which would reduce the transaction costs of unconditional contracts. In other words, a need for "free trade zones" emerges, which, in the context of the ROSCA, facilitates exact reciprocity under the terms of an unconditional contract. In the ROSCA the contract is unconditional: it is money for money, and the time frame is exactly specified.

To distinguish clearly between conditional and unconditional contracting, the ROSCA in fact prohibits direct individual-to-individual transactions. Contributions are made into a collective fund, which is handed over to the president who can be seen as the legal person representing the collective. He or she then allocates the fund to a particular individual. In the process, the enforcement problem is qualitatively altered: the contract is transformed from a person-to-person contract embedded in generalized reciprocity to an unconditional contract embedded in the ROSCA setting. In other words, the collective "cosigns" each loan. Defaulting by one individual now directly threatens to

---

<sup>33</sup> The existing property regime clearly distinguishes between the crop, i.e., the produce of labor and capital, and the land on which the crop stands. Within the village community, the sale of the land itself is deemed illegal. Sales to strangers, however, do in fact occur, but the payments are often masked as symbolic gifts given the notion of illegality which surrounds the outright sale of land.

compromise a multitude of other unconditional contracts. Inasmuch as individuals value the benefits of continued membership in the collective more than they value the benefits of defaulting, the contract is self-enforcing. The intermediation of the group reduces the risk of the credit transaction.

To deal with this informational problem, one could introduce asset collateral into the private moneylending transaction. This could potentially increase repayment. However, although the coffee-on-the-tree moneylending was essentially collateralized credit, it is not clear that it would necessarily result in a more efficient credit scheme. Even the credit system of the coffee cooperative, in which the cooperative supplies preharvest credit, was characterized by lower repayment rates than the ROSCA. As with the ROSCA, it seems that members' evaluation of the total future benefits of continued membership is the crucial factor of successful enforcement, not the introduction of collateral per se.

The Credit Union, which operates in the village, is a formal savings and credit cooperative. Firstly, how important is the Credit Union compared to ROSCA in terms of membership? As mentioned, at least 90 percent of all household heads are a member of ROSCA. The number of members of the Credit Union in the village was 199, which is 30 percent of the total number of ROSCA members. It appears that the Credit Union attracts substantial amounts of savings because people generally feel that their savings are safe and out of reach of the contingent claims of the local networking economy. In fact, the bureaucratic hassles members experience in withdrawing their savings seem even to work in favor of the Credit Union, because they reduce the liquidity of savings kept in a credit union account.

However, the possibility that the Credit Union has created for the cosigning of loans has enabled the networking economy to infiltrate its operations. The fact that an individual cannot withdraw savings, which serve as a guarantee for another individual's loan, is often mentioned as the greatest disadvantage of the Credit Union.

Another, more structural problem of the Credit Union is its limited capacity to reinvest savings locally. The lack of investment capacity constrains the operations of this institution. The equity implications of the information problems, which are at the basis of this low capacity to profitably invest funds locally, are equally important. Organizations like the Credit Union run the danger of substituting lack of information with what is perceived as "low-risk" loans. This often biases credit transactions toward the local elite.

The ROSCA system of the village handled 74,000 dollars annually, given out in 650 loans, or approximately 75 dollars per member. The Credit Union, in the same year, handled only 3,800 dollars given out in 37 loans, which is about 105 dollars per loan. At the same time, an increasing number of loans were rescheduled loans and posed a serious danger to the institution's long term viability.

What other formal credit alternatives exist? Donor-initiated revolving fund credit systems in the rural areas of West Africa generally do not revolve. Repayment rates are generally very low. Administrators may give a plethora of reasons for this failure (insufficient rainfall, peasant ignorance, absence of the cooperative spirit, lack of operating funds, etc.), but these are probably not at the heart of the general and widespread failure of these credit programs in rural Africa. The single most important problem of these institutions is an enforcement problem. Lack of incentives for management might be one reason for the low repayment rates usually associated with revolving fund schemes, since management is generally *not* judged on loan performance. In fact, most donors explicitly do not want their funds to return to the donor level, which is exactly why the revolving fund serves their purposes so well. Whereas that might be a laudable principle, it merely shifts the responsibility for enforcement to the recipient organization.

However, donor organizations rarely sanction the national and local bureaucracies that administer the credit schemes on loan performance. On the contrary, African and donor administrations alike are routinely evaluated on "absorption" capacity, i.e., their capacity to absorb new loans. As long as past performance of loans has no significant effect on the supply of new loans, the problem of lack of management incentives will probably remain. Is the relation between the African bureaucracies and the donor organizations also one of "conditional contracting" compromised by adverse selection and moral hazard? Even if the answer to the latter question is not affirmative, one has to concede that neither of the administering parties (donor and national) is evaluated on loan performance. From the extension agent,<sup>34</sup> via the local bureaucracy and its technical assistance, to the donor administration, one will find that, although nobody is particularly enthusiastic about the low repayment rates in formal credit schemes, no routine sanctioning (positive or negative) of administrative performance tied to repayment of loans exists. Whether or not the target groups know that such is the case, we will leave as an open question. Do low repayment rates basically stem from strategic behavior on their part?

A much more promising strategy for formal credit schemes would involve some form of collective liability, as in the ROSCA system. The automatic exclusion of a collective from new loans if one of its members fails to repay would involve, however, a coordination problem between competing formal credit schemes. Uncoordinated competition between donors unfortunately does exist. If that problem were solved, enforcement of sanctions would probably be evaluated as credible by the target group.

Another type of credit scheme is centered around a "technical package." It faces the same information and enforcement problems as the revolving fund schemes but adds to this the obligatory adoption of a supposedly profitable package of inputs (for instance, animal traction, fertilizers, pesticides, etc.). Many of

---

<sup>34</sup> The extension agents face the added problem of reconciliation of two potentially conflicting roles. He or she has to wear the conflicting hats of propagator and enforcer of a loan.

such technological packages are poorly adapted to the particular agroclimatic conditions prevalent in sub-Saharan Africa. As a result, the distribution of unprofitable technology on credit is a widespread phenomenon. Fortunately for the farmers, poor repayment rates on such "credit in kind" packages are equally widespread.

## 6. POSTSCRIPT: ON CREDIT AND INSURANCE

In analyzing economic exchanges within the institutional setting of the wider kinship – or tribal – system, economic anthropologists distinguish among the following three governing principles:<sup>35</sup>

1. *Generalized reciprocity*. The transaction triggers an obligation to reciprocate, but it is "diffuse" with respect to timing and exact content.
2. *Balanced reciprocity*. The transaction operates according to the familiar principle of "quid pro quo" within a well-defined time period.
3. *Negative reciprocity*. The transaction can be interpreted as exploitative behavior.

We might be tempted to think of market behavior only as all behavior falling squarely within the category of balanced reciprocity, viz. *unconditional economic contracting* under which the terms of exchange are certain at the time of the transaction. However, within the context of kinship-based economies, behavior described as generalized reciprocity is of particular economic importance. Generalized reciprocity is typically associated with transactions that embody an element of insurance and that deal with certain contingent commitments to future goods and services. To the extent that the kinship system is a multipurpose insurance scheme dealing with health risks, unemployment, crop failure, and retirement plans, generalized reciprocity is essentially a categorization which covers a set of *state-dependent, implicit contracts* between individuals (see also Bromley and Chavas 1989).

In generalized reciprocity, all the standard economic problems associated with contracting under uncertainty and imperfect information can arise: moral hazard, adverse selection, informational asymmetries, etc. An attempt to solve these problems is typically made by establishing durable partnerships based on trust and mutual knowledge between the actors. In other words, by way of generalized reciprocity within the kinship structure, individuals become shareholders of the same economic institution.

At the same time, it often seems that balanced reciprocity or unconditional contracting (the quid pro quo within a well-defined period) – tends to become

---

<sup>35</sup> See Sahlins (1968). These categories are not mutually exclusive and discrete. Rather, they represent different nodes on a continuum, which ranges from pure gift giving to outright theft.

characteristic of transactions with individuals outside the kinship system, e.g., strangers.<sup>36</sup> To accommodate transactions of balanced reciprocity, the kinship system may create *free trade zones* – niches of unconditional contracting – within the system, just as it often does with strangers outside the system. In these free trade zones, balanced reciprocity or unconditional contracting is the rule. Rotating labor groups or rotating credit associations are good examples of such niches of unconditional contracting. Unconditional contracts – balanced reciprocity – benefit from the existence of the conditional contracts – generalized reciprocity. Since kinship provides for stability and mutual trust in economic relations, defaulting on unconditional contracts, which are embedded in the institutional setting of generalized reciprocity, can be subject to formidable sanctioning mechanisms.<sup>37</sup> This suggests that the better generalized reciprocity works, the more efficient the balanced form is.

However, insurance, i.e., the active pooling of risk by means of generalized reciprocity or conditional contracting, is not costless. Its funding is ultimately based on individual payments that are basically a form of investment in an asset. Since the asset, i.e., state dependent benefit claims on the economic network, is specific to the institutional setting in which it is embedded, a situation of *asset specificity* arises (see Williamson 1985). To the extent that this asset provides the collateral that secures the unconditional transactions in the ROSCA, its market is imperfect outside of the medium in which the asset is fixed, i.e., the village network.

An apparently peculiar advantage of the ROSCA is that the individual can now transfer money out of the reach of the generalized reciprocity system. Thus, the opportunity the ROSCA provides for depositing money out of reach of such claims is a benefit of the ROSCA that many informants verbalize very directly: "I can hide money in *njangeh*"; or, "My family would chop all my money if it weren't for *njangeh*." These preferences seem to play an important role in the high valuation of the indivisible good in the kinship-based economy.<sup>38</sup> The more pressure there is on the individual to spend liquid assets, the more he or she will value the benefits of a lump-sum investment.

The ROSCA fulfills an essential service in this respect: every month the individual is compelled to contribute. Only when it is one's turn to receive the

---

<sup>36</sup> However, these transactions may ultimately also be transformed into generalized reciprocity: the immigrant sharecropper in the Gambia is often treated "like a son" by his landlord (Robertson 1987).

<sup>37</sup> For instance, this appears to be the reason why in West African long-distance trading ethnic monopolies arise as if they were somehow "natural": the kinship system provides an incentive structure which reduces the risk of default, fraud, and moral hazard.

<sup>38</sup> Such preferences for nonliquid assets are also at the basis of the typical African phenomenon of unfinished houses, which seem to be perpetually under construction.



fund is the individual "liquid": he or she can now better anticipate the use of those liquid assets. Moreover, while in the process of saving, the individual has a socially acceptable defense against claims of other people. Such temporal liquidity arguments are illustrated by remarks such as: "People cannot bore you by asking for money," or "Your relatives can ask you for money only at the right time."

In a kinship economy, direct relatives are a prominent source of contingent claims and strategic bargaining. In-laws, for instance, are notorious claimants. If an individual's in-laws were members of the same ROSCA, they would, first, have access to accurate information on the individual's financial wealth and, second, they would know exactly when to make their claims. One question asked of ROSCA members was whether they had any relatives in the same ROSCA. Their answers provided some evidence of temporal liquidity preferences: the higher the average level of contributions in a ROSCA, the fewer the relatives.<sup>39</sup>

Finally, it is of interest to examine the influence of wealth on the relative importance of generalized reciprocity versus balanced reciprocity. In general, one may expect that insurance motives and wealth accumulation are *substitutes*: the demand for insurance decreases as private wealth increases, *ceteris paribus*. To the extent that only generalized reciprocity can satisfy insurance needs, the importance of generalized (balanced) reciprocity would tend to decrease (increase) with wealth accumulation. In other words, the wealthier one is, the less one needs to rely on contingent claims from the kinship system, and the more one may use balanced reciprocity. There is some empirical evidence supporting this hypothesis: contributions to the ROSCA increased considerably between 1971 and 1980, a period over which general wealth in the village significantly increased.

---

<sup>39</sup> Spearman's rank correlation coefficient for the observed relation was 0.8214, significant at the 5-percent level.

## 7. CONCLUSIONS

The *njangeh* is a type of rotating savings and credit association, usually classified as an informal system, although such a qualification seems largely at odds with the explicit lack of informality in the ROSCA institution. Credit was inseparably linked to saving, as in all sound banking systems. The ROSCA enabled its members to undertake personal lumpy investment projects and provided a solution to the economic problem of indivisible goods within certain bounds, defined by the opportunity costs of saving and borrowing (13). If the benefits  $b$  associated with the indivisible good  $B$  fell within this range – defined as a function of exogenously given interest rates on savings ( $r$ ) and credit ( $i$ ) – it would be profitable for the average individual to participate in a ROSCA.

$$rB < b < 2iB \quad (13)$$

The particular institutional design of the ROSCA considerably reduced the risk of default. In particular, the order of rotation and the partial collateralization by the trouble bank were instrumental in reducing such risk. Moreover, sanctioning of ROSCA management was directly linked to loan performance through the rule that the president had to take the last position in the order of rotation. Since information and enforcement problems were thus greatly reduced, the institution did not rely on collateral in the form of physical assets as security for credit transactions. Additionally, there was no need to charge interest solely in order to compensate for the risks of default.

The empirical evidence from a village in Cameroon indicates that the ROSCA outperformed, in terms of efficiency and equity, all other credit institutions in the region by reaching virtually every household in the village, handling thousands of credit transactions every year, and doing so at a relatively low level of transactions costs. Within the village setting, there seem to be no major constraints for expansion of the ROSCA system.<sup>40</sup> ROSCAs also adapt to urban settings. However, urban ROSCAs rely less on the sanctioning mechanisms of the kinship-based social structure. Members directly and forcefully seize property of a defaulting member.

A word of caution seems necessary. This paper does not advocate the inclusion of ROSCAs in development projects. At no point, moreover, do we draw the conclusion that, for instance, agricultural credit programs should be

---

<sup>40</sup> Moreover, although no quantitative data exist to our knowledge, we were repeatedly told by various informants that the financial economy of Western Cameroon was crucially dependent on extremely wealthy ROSCAs (e.g., fund sizes of over 10,000 dollars per month) run by Bamileke traders.

replaced by ROSCA systems. Government intervention in the credit sector is inherently limited by informational problems and the lack of incentives for government agents to effectively monitor and enforce credit transactions. The unconditional contracts of ROSCAs ultimately depend on the wider sanctioning mechanisms of the kinship-based economy. The government is typically not part of this "moral economy" or "economy of affection" (Hyden 1986) and is often unwilling to enforce loan repayment. Direct government involvement in the provision of credit through ROSCAs would probably substantially increase default rates.

We believe that the role of government lies in providing a legal framework for ROSCAs. To the extent that formal legalization would improve the recovery of loans in situations in which recovery is problematic, the informal credit sector would benefit from legalization. It seems prudent, however, to make government intervention in the legal aspects of credit transactions dependent on the explicit demands of the associations themselves. To allow the ROSCA system to capture certain economies of scale, it would be particularly interesting if a legal and financial framework could be created which would enable credit transactions to be extended beyond the village level, for instance as a "super" ROSCA, which rotates funds *between* ROSCAs.

Finally, practitioners of development economics could benefit considerably from a better understanding of the informal credit sector. For instance, most ROSCAs keep records which, given the proper introduction, are readily accessible to researchers. Questions in formal surveys can be framed more specifically. The question "Have you borrowed any money?" and, if yes, "From whom?" is usually not specific enough. Respondents seldom associate this question with their membership in a ROSCA. Such unspecific questions yield unspecific answers, e.g., "friends" and "relatives," often leading the researcher to hastily conclude that credit markets are virtually absent or are merely constituted by a narrow circle of "friends" and "relatives." In other words, the researcher may not notice the existence of credit institutions, such as the ROSCA, by failing to ask the appropriate questions.

## REFERENCES

- Alchian, A., and H. Demsetz. 1972. "Production, Information Costs, and Economic Organization." *American Economic Review*. 62 (December): 777-795.
- Ardener, S. 1964. "The Comparative Study of Rotating Credit Associations." *Journal of Royal Anthropological Institute*. 92(2): 201-229.
- \_\_\_\_\_. 1953. "The Social and Economic Significance of the Contribution Club among a Section of the Southern Ibo." Annual Conference, West African Institute of Social and Economic Research, Sociology Section, Ibadan, 128-142.
- Basu, K. 1984. "Implicit Interest Rates, Usury and Isolation in Backward Agriculture." *Cambridge Journal of Economics*. 8: 145-159.
- Besley, Timothy, Stephen Coate, and Glenn Lowry. 1990. *The Economics of Rotating Savings and Credit Associations*. Discussion Paper No. 149. Princeton, NJ: Princeton University, Center of International Studies, Woodrow Wilson School.
- Bhaduri, A. 1973. "A Study in Agricultural Backwardness under Semi-Feudalism." *Economic Journal*. 83: 341-352.
- Bouman, F.J.A. 1977. "Indigenous Savings and Credit Societies in the Third World: A Message." *Savings and Development*. 1(4): 181-220.
- Bouman, F.J.A., and K. Harteveld. 1976. "The Djanggi, A Traditional Form of Saving and Credit in West Cameroon." *Sociologia Ruralis*. 16(1): 103-119.
- Bromley, Daniel W., and Jean-Paul Chavas. 1989. "On Risk, Transactions, and Economic Development in the Semiarid Tropics." *Economic Development and Cultural Change*. 37(4): 719-736.
- Den Ouden, Jan H. B. 1987. "In Search of Personal Mobility: Changing Interpersonal Relations in Two Bamilike Chiefdoms, Cameroon." *Africa*. 57(1): 3-27.
- Friedman, James W. 1986. *Game Theory with Applications to Economics*. New York and Oxford: Oxford University Press.
- Fry, Maxwell J. 1988. *Money, Interest, and Banking in Economic Development*. Baltimore and London: The Johns Hopkins University Press.

- Geertz, C. 1962. "The Rotating Credit Association: A 'Middle Rung' in Development." *Economic Development and Cultural Change*. 10(3): 241-263.
- Hart, G. 1986. "Interlocking Transactions: Obstacles, Precursors or Instruments of Agrarian Capitalism?" *Journal of Development Economics*. 23: 177-203.
- Hyden, G. 1986. "African Social Structure and Economic Development." In *Strategies for African Development*. R. J. Berg and J. Seymour Whitaker, eds. Berkeley: University of California Press, 52-77.
- Illy, H. F. 1973. "Saving and Credit System of the Bamileke in Cameroon: A Study on the Internal Financing of Development." In *Development Policy in Africa*. J. Voss, ed. Bonn: Verlag Neve Gesellschaft GmbH, 293-314.
- Kurtz, Donald V., and Margaret Showman. 1977. *The Tanda: A Rotating Credit Association in Mexico*. Discussion Paper No. 61 (August). Milwaukee: Center for Latin America, University of Wisconsin.
- Miracle, M. P., D. S. Miracle, and L. Cohen. 1980. "Informal Savings Mobilization in Africa." *Economic Development and Cultural Change*. 28(4): 701-724.
- Nwabughuogu, Anthony I. 1984. "The *Isusu*: An Institution for Capital Formation Among the Ngwa Igbo; its Origin and Development to 1951." *Africa*. 54(4): 46-58.
- Nweze, Noble Y. 1990. *The Role of Women's Traditional Savings and Credit Cooperatives in Small-Farm Development*. African Social Science Series Research Report No. 11. Morrilton, AK: Winrock International Institute for Agricultural Development.
- Owen, P. D., and O. Solis-Fallas. 1989. "Unorganized Money Markets and 'Unproductive' Assets in the New Structuralist Critique of Financial Liberalization." *Journal of Development Economics*. 31(2): 341-355.
- Penny, David H. 1968. "Farm Credit Policy in the Early Stages of Agricultural Development." *Australian Journal of Agricultural Development*. 12: 32-45.
- Robertson, A. F. 1987. *The Dynamics of Productive Relationships: African Share Contracts in Comparative Perspective*. London: Cambridge University Press.
- Sahlins, Marshall D. 1968. *Tribesmen*. New Jersey: Prentice-Hall Inc.
- Sahn, David E., and Alexander Sarris. 1991. *Structural Adjustment and Rural Smallholder Welfare: A Comparative Analysis from Sub-Saharan Africa*. Working Paper No. 3. Ithaca, NY: Cornell Food and Nutrition Policy Program.

- Stiglitz, Joseph E. 1989. "Rational Peasants, Efficient Institutions, and a Theory of Rural Organization: Methodological Remarks for Development Economics." In *The Economic Theory of Agrarian Institutions*. Pranab Bardhan, ed. Oxford: Clarendon Press.
- Van den Brink, R.J.E. 1980. *Big Babanki Revisited. A Study on Rotating Savings and Credit Associations in the Grassfields of Cameroon*. Wageningen, The Netherlands: Department of Agricultural Sociology of the Tropics and Subtropics, Landbouwhogeschool. Photocopy.
- Van Wijnbergen, S. 1983. "Interest Rate Management in LDC's." *Journal of Monetary Economics*. 12 (September): 433-452.
- Von Pischke, J. D., Dale W. Adams, and Gordon Donald. 1983. *Rural Financial Markets in Developing Countries: Their Use and Abuse*. Baltimore and London: The Johns Hopkins University Press for the Economic Development Institute of the World Bank.
- Williamson, Oliver E. 1985. *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting*. New York: Free Press.
- World Bank. 1990. *Analysis Plans for Understanding the Social Dimensions of Adjustment*. Report No. 8691-AFR (July). Washington, DC: World Bank, Social Dimensions of Adjustment Unit, Africa Region.