Pretending to Be Poor: Borrowing to Escape Forced Solidarity in Cameroon

JEAN-MARIE BALAND
University of Namur

CATHERINE GUIRKINGER
University of Namur

CHARLOTTE MALI
University of Namur

I. Introduction

A field survey that we carried out on credit cooperatives in Cameroon reveals a puzzling behavior: 19% of the loans taken are fully collateralized by savings available on the borrowers' saving account. For these loans, the amount of savings available to the borrowing member is, on average, twice as large as the amount of the loan. This behavior of "excess borrowing" is costly, as these members could save on substantial interest payments by self-financing their project with their savings.

Similar cases of simultaneous borrowing and savings have been reported in the literature. In their analysis of liquidity constraints among consumers in the United States, Gross and Souleles (2002) estimate that one-third of credit card borrowers have more than 1-month's worth of gross total household income in checking and saving accounts. They argue that these households could have paid off part of their expensive credit card debt by drawing down these low-return, liquid assets. To answer this puzzle, two types of explanations have been proposed. The first approach highlights the existence of indirect benefits from excess borrowing. These households may need liquid assets for specific transactions and precautionary purposes and therefore choose to run credit card debt while holding positive balances on liquid accounts. This is because there are large parts of household expenditures, such as rent payments

or medical emergencies, that cannot be paid for by credit card (see, in particular, Telyukova and Wright 2007; Zinman 2007; Telyukova 2009).[1] The building up of a credit history provides another potential benefit of excess borrowing, as agents may initially take small loans to secure lower interest rates or larger amounts for future loans. Finally, as outlined by Levine (1997, 2004), if projects are long term and risky, entrepreneurs will be reluctant to finance them entirely with internal funds and would prefer to share the risk by financing a portion with borrowed funds. Under limited liability, a loan becomes a vehicle for risk diversification. In the absence of credit, risky projects will go unfunded, despite the existence of sufficient internal funds. Thus, differences in the time horizon and risk level of projects may explain why some borrowers engage in excess borrowing and some borrowers do not.

The second approach relies on behavioral explanations. Holding debt obligations may be viewed as a strategy to protect savings from either future or other selves. Laibson, Repetto, and Tobacman (2003) argue that the existence of a sanction in the case of default implies that paying back a loan may be easier than saving in the presence of commitment problems. Individuals with time-inconsistent preferences therefore engage in illiquid saving to protect their money from their future selves and rely on credit to fulfill immediate cash needs.[2] A particular instance of illiquidity explored by Basu (2009) occurs when future access to savings is uncertain so that the borrower cannot rely on savings to pay back his loan.[3] Bertaut and Haliassos (2002) propose a model based on self-control and mental accounts where holding credit card debt may help the "accountant self" to restrict to the allowable credit limit the purchases that the "shopper self" can make. More generally, a consumer may view debt repayments and savings as part of two different mental accounts.

In our particular context, savings used as collateral for the loan are illiquid for the duration of the loan. As a result, they cannot be used for transactions or precautionary purposes. Moreover, under excess borrowing, the borrowers' savings are seized in the event of default. Because of full liability, there is no risk sharing with the lender. In addition, as credit and savings take place in the same institution, regular savings payments and regular reimbursements

---

[1] Relatedly, savings may be kept to secure access to future loans, before the current loan is fully reimbursed. However, in our setting, cooperatives do not allow for multiple simultaneous loans: it is not possible to take a new loan before the current loan is completely reimbursed.

[2] In the context of Rotating Savings and Credit Associations (ROSCAS), Gugerty (2007) provides empirical evidence from Kenya to support the view that individuals choose saving products that enable them to overcome commitment problems.

[3] This explanation was motivated by the existence of simultaneous borrowing and saving in a Peruvian MFI, FINCA, where savings are intragroup and lent to other group members so that ready access to these savings is not guaranteed.

provide the lender with similar information about the financial discipline of the member.[4] By saving, the member is always able to replicate the payments due under a credit contract. Furthermore, the local cooperatives explicitly allow borrowers to draw on these savings to pay back their loans. As a result, taking a loan does not effectively protect savings against future selves. A time-inconsistent member will always be tempted to use his savings to pay back his loan.[5] Therefore, the arguments based on cash needs for transaction purposes, credit history, risk sharing, and time-inconsistent preferences do not seem the most convincing explanations for the observed phenomenon.

Interviews with members of these cooperatives point to two other possible rationales for excess borrowing. The first one relates to the mental account explanation provided by the behavioral literature. The other is new. It is based on the idea that excess borrowing is a strategy used by some members to protect their savings from demands for money by relatives and friends. By taking a loan, the member signals to the latter that he is currently cash constrained and cannot respond to their demands. One member summarizes it as follows: "When I take a loan from my savings, my children and my wife think I have no money. I do it on purpose. If I simply withdraw my money, it will end, so I tell them that I borrowed. Then, when one complains he has a problem, I say I have to pay back my loan. It protects me from my children's demands." While taking a loan may seem an expensive mechanism to escape solidarity obligations, it needs to be examined in light of the African context. Social pressure for interpersonal redistribution in the form of cash transfers is high in Africa (Kennedy 1988; Platteau 2000), and several studies reveal a large demand for hidden or protected savings (Miracle, Miracle, and Cohen 1980). Anderson and Baland (2002), for example, show that the need to protect savings from their husbands triggers women's participation in ROSCAS in a Kenyan slum. Closely related to this paper, Kinnan (2009) shows that hidden income is the main obstacle against full risk sharing among households in rural Thailand. Our article can be viewed as illustrating a particular mechanism used by households to hide their income and thereby evade their social obligations (such as those involved in informal risk-sharing arrangements).

The article is organized as follows: in Section II, we document the importance of excess borrowing in credit cooperatives in Cameroon. In Section III, we present ethnographic evidence based on interviews made with some mem-

---

[4] Strictly speaking, saving and borrowing are not equivalent in the presence of moral hazard. The latter argument, however, does not apply if the main purpose of the loan is to build up a credit history.

[5] The argument is further strengthened by the fact that interest payments reduce his future income and thereby further decrease his incentives to maintain his savings.

bers. In Section IV, we develop a signaling model to analyze the conditions under which excess borrowing is an equilibrium strategy, and Section V concludes.

II. The Prevalence of Excess Borrowing in Credit Cooperatives in Cameroon

A. Context and Survey Methodology

We carried out a field survey of rural credit cooperatives in Cameroon in 2006. The survey focused on a microfinance network called Cameroon Cooperative Credit Union League (CamCCUL). The network, created in 1964, is composed of a large number of local credit and savings cooperatives. We surveyed four of these cooperatives and collected information on all credit operations and deposits of their members between 2004 and 2006.[6] We also conducted semi-open interviews with 22 members in order to investigate the motives behind their savings and credit operations. Eighteen of the interviewees were members who borrowed less than the amount of their available savings.

Each cooperative is composed of 200–700 members, out of which about one-third can be considered active (i.e., they made at least one financial operation over the past 12 months). There are, on average, 266 active members per cooperative. Each cooperative offers to its members two types of financial services: savings accounts and credit. With a savings account, a member can freely deposit and withdraw money at any time. However, each cooperative requires members to deposit a minimum amount in their savings account that cannot be withdrawn. This amount varies from 10,000 to 230,00 CFA across cooperatives.[7] Savings earn a yearly interest that varies between 3.6% and 6.0%, depending on the performance of the cooperative. Over the period considered, average savings in the cooperative were 117,000 CFA per member (which corresponds to the monthly wage rate of a secretary).

The conditions to obtain a credit are rather strict. First, the amount borrowed cannot exceed three to five times the total amount of the savings account. This loan multiplier varies across cooperatives and defines the credit line available to each member. Second, the borrower must have been a member for at least 6 months and must offer a collateral that exceeds the value of the loan (savings in the cooperative, land titles, cosigners). Moreover, if the amount

---

[6] We did not run a separate household survey on the members but restricted ourselves to the information contained in the files of the credit cooperatives. We are therefore not in a position to relate excess borrowing to particular characteristics of the borrower, such as his total wealth or the number of his relatives.

[7] In 2006, 10,000 CFA was approximately equivalent to US$20.

TABLE 1
COMPARISON OF LOANS AND SAVINGS AMOUNTS IN THE FOUR COOPERATIVES (1,000 CFA)

	All Loans	$B \leq S_L$	$B > S_L$	Mean Difference (t-Test)
Number of loans	1,427	272	1,155	
%	100.0	19.1	80.9	
Loan amount (B):				
Mean	309.3	88.1	361.3	. . .
Median	100.0	40.0	150.0	
SD	652.1	196.1	708.6	
Borrower's total savings (S_T):				
Mean	126.2	243.3	98.6	. . .
Median	60.3	118.5	50.1	
SD	256.6	414.6	192.4	
Borrower's liquid savings (S_L):				
Mean	111.7	230.4	83.7	. . .
Median	45.9	106.1	23.0	
SD	256.2	413.7	191.9	
B/S_L (median) years of membership:	2.9	.5	3.8	
Mean*	4.8	5.9	4.5	. . .
Median	4.0	6.0	3.0	
SD	4.1	4.1	4.1	

Note. Ellipses indicate that the difference in mean across the two types of loans is significant at 1%.
* The difference holds if we compute the mean separately in each cooperative to account for different starting dates.

borrowed exceeds savings, no withdrawal from the savings account is permitted until the loan is fully repaid. If the amount borrowed is lower than one's savings, the excess savings are at the member's disposal. On average, 150 loans are given in each cooperative over the period considered, which corresponds to 0.56 loans per active member. Interest rates on loans are equal to 24% or 36% per year, depending on the cooperative.[8] The average maturity is equal to 6.26 months.

B. Excess Borrowing: The Evidence

Through our survey, we recorded a total of 1,427 individual loans, the identity of the borrower, and the amount of his savings. Table 1 presents information about these loans and savings. To account for the fact that total savings, S_T, includes a minimum amount that must be left on the account, we define liquid savings, S_L, as the amount that exceeds this minimum amount and can thus be withdrawn at any time. Across all members, the median loan size is 10,0000 CFA, and the median amount of total savings held at the time of the loan is 60,300 CFA, with a corresponding loan-to-savings ratio equal to

[8] Real interest rates are relatively high given inflation rates equal to 2.0% in 2006 and 2.4% in 2007.

1.7. The corresponding average amounts are higher: the average loan equals 309,300 CFA, an average saving of 126,200 CFA, and a corresponding loan-to-savings ratio equal to 2.45.

Loan-to-savings ratios differ considerably across borrowers. Column 2 in table 1 shows that 19.1% of the borrowers take a loan of amount B that is smaller than the amount of their liquid savings ($B \leq S_L$). For those borrowers, the median loan-to-liquid-savings ratio is 0.5, implying that the amount they borrow is one-half of the amount of savings that is readily available in their account. By contrast, 80.9% of the borrowers take a loan that exceeds their liquid savings ($B > S_L$), with a median loan-to-liquid-savings ratio of 3.8. It is striking that those who borrow less than their liquid savings have also accumulated a much larger amount of savings, with an average of 243,300 CFA, which is substantially more than the corresponding 98,600 CFA for the borrowers in the other category. Conversely, the amounts borrowed are smaller, as the average amount borrowed in the first category is 88,100 CFA, while it is 361,300 CFA in the other category. Finally, it is worth noting that, at the time of credit, those who borrow less than their savings are older members of the cooperative.[9] This suggests that excess borrowing is not a strategy used by younger members to build up their reputations.

Another way to present this evidence is to compare the amount borrowed by a member to his credit line. The latter, which is the maximum that a member can borrow given his total savings, was computed by applying the official rules of the cooperative to which the member belongs. We then computed for each loan the ratio of the loan size to the credit line of the borrower. Figure 1 presents the distribution of this ratio, which is clearly bimodal. While about a fourth of the loans fully exhaust the credit line, a large number of loans are much smaller. Thus, 28% of the loans fall below one-fifth of the credit line. All borrowers in this situation borrow less than their total savings.

As already discussed, borrowers who have enough savings available and choose to borrow could save on interest payments by self-financing their project. Given an average monthly interest per loan of 2.25% and an average monthly interest on savings of 0.41%, the cost of this strategy is equal to the payment of a net annual interest rate of 24.46%.

The argument also applies to all members who borrow less than their credit line, since they could save on interest payments by withdrawing some of their savings and reducing their loan by a corresponding amount. Clearly, to min-

---

[9] Of course, cooperatives started at different dates. For ease of exposition, we report aggregate figures in the table, but the difference in years of membership also holds in each cooperative taken separately.
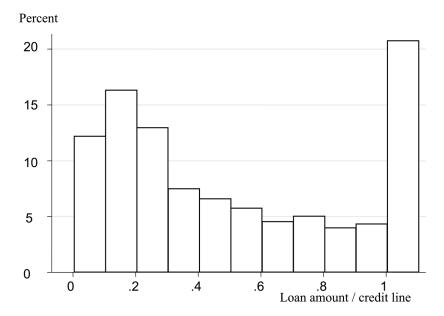
Percent

Figure 1. Distribution of the ratio of loan size to borrower's credit line

imize interest payments, members should always exhaust their credit line. We define the cost-minimizing savings, S^*, as the minimum amount that must be left in the savings account to maintain the credit line that enables him to finance the project. The amount to be financed initially is equal to B. Let S_T represent the amount of total initial savings and λ the loan multiplier. S^* is such that $B = S_T - S^* + \lambda S^*$. In this equation $S_T - S^*$ corresponds to the part of the project that is self-financed, while λS^* is borrowed.[10] We compute the proportion of the loan that could be self-financed under this cost minimizing strategy, $(S_T - S^*)/B$.[11] Figure 2 presents the distribution of this ratio, which is clearly bimodal. For a majority of the loans, this ratio is close to zero (below 0.2), which corresponds to the cost-minimizing behavior. At the other end, 19% of the loans have a ratio greater or equal to one, which corresponds to the group of borrowers who could entirely self-finance their loan in the cooperative. In between are borrowers who cannot fully self-finance

[10] Note that the initial collateral is always large enough to justify the new borrowing scheme. The borrower has an initial collateral of at least B, out of which $B - S_T$ corresponds to nonsavings collateral. Consider a reduction in savings by $1. As this reduces the amount to be borrowed by exactly $1, it leaves the required nonsavings collateral unchanged.

[11] In fig. 2, we also take into account the fact that a minimum amount must be left in the savings account. Members cannot withdraw more than their liquid savings, S_L, so that the figure reported is actually the minimum of $((S_T - S^*)/B, S_L/B)$.
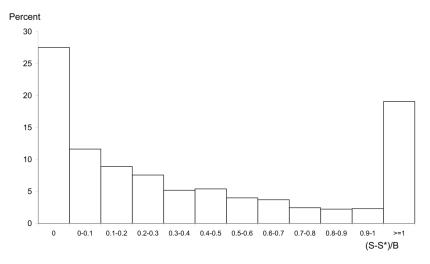
Percent

Figure 2. Distribution of cost-minimizing reduction in saving, $S - S^*$ (as a proportion of loan size, B)

their loan but could have substantially reduced their interest payments by taking a smaller loan and drawing on their savings.[12] Note that, given our limited data, we do not really know the size of the projects being financed and the alternative sources of funds available to the individuals. As a result, the borrowers' classification used here remains somewhat imprecise.

III. Excess Borrowing as a Signaling Strategy: Ethnographic Evidence
In this section, we first focus on the use of excess borrowing as a strategy to signal financial difficulties to relatives in search of financial help. Reimbursement obligations are then used as an argument to discourage such demands.

As suggested by our interviews, demands for help are frequent and represent a major impediment to save; for example, "I have to help many people. There are many people below me who expect me to help them. It is hard but I am forced to help." While close relatives are often solicited for help, solidarity obligations extend much beyond to distant kin. "There is one thing in Africa: we have a family. The family is elastic. There is the little brother of your father, of your mother. . . . Everyone with a problem, you are condemned to help. Saving is difficult because there are always problems. You have to squeeze

[12] This behavior may also be consistent with our main interpretation. First, it is likely that the credibility of the signal is enhanced by the size of the loan. In particular, the amounts borrowed should be consistent with the living standards of the member. Second, consider those people who have repeatedly denied having savings. When they invest in a project of known size, such as a motorcycle, using their savings could damage their reputation. They may thus prefer to borrow the full amount.

your heart before putting money on your saving account." "Mostly daddies make troubles; they want to drink. Mothers and friends can understand that we have our own problems and leave us alone, but daddies cannot!"

Individuals are secretive with respect to their savings and income, even within the household. "Money is a terrible thing. Nobody should know what you have in your pocket. If my wives knew what I have, they would create new problems to force me to spend my money." This behavior does not seem to depend on gender. "Here we hide money a lot. I hide money from my brothers and my husband. Every time they know I have money, they come with new demands." "To be happy, live hidden!"[13] "When a husband knows you have something, he will do anything to have you get the money, until nothing is left. Men here in Africa, to be happy with their wives, shouldn't set their eyes on their money. And his other wives, if they know you have money, they will be jealous." "My husband ignores how much is on my account. When I save I don't tell him, and I make sure to hide my passbook. When I take a loan I even tell him how much I borrowed."

The existence of a loan is used as an excuse to avoid demands. "Sometimes when somebody comes crying for help, I say I have nothing. The loan is a good excuse not to be bothered." This is because family members who observe a loan assume the borrower is poor. "When I borrow money, my wife thinks I don't have money on my account. How can you have money and borrow? She thinks that I have no money, and that is why I take a loan." "If I take a credit to pay school fees for a child, he cannot come and ask for a new pair of shoes. But if I take money from my savings, they always ask for other things. If I take a loan, they believe I have no money." "Even when I use my savings to get a loan, I can tell my family that I have nothing. I say that I have a problem, that I must reimburse my loan. This is why I prefer to borrow."

Table 2 summarizes the answers given in the interviews by the 18 members who practiced excess borrowing ($B < S$). Two questions are of direct relevance. The first one reports the various motives for excess borrowing. It is striking to see that 17 members reported using this strategy as a protection against the demands from relatives and friends. They also mentioned the difficulties "to save on one's own," an answer that is unfortunately much less precise as it may relate either to the pressure from relatives or to some behavioral explanation. We return to this issue below. The second question investigates whether family members know about the existence and the amounts of savings and credit at the cooperative. While for most members, the existence of a savings account (which involves membership) and of a credit contract are

---

[13] Our translation of the French proverb "pour vivre heureux, vivons cachés."

TABLE 2

ANSWERS TO EXCERPTS OF THE MEMBERS' QUESTIONNAIRE FOR THE 18 MEMBERS WITH $B < S$

Question	Frequency of "Yes"
Why did you take a loan instead of drawing on your savings?	
Because it is hard to save on your own	18
Because it facilitates access to future loans	1
Because savings is not easily available	0
Because it protects my savings from demands by relatives and friends	17
Do other members of your households know about:	
The existence of your saving account?	18
The amount of your savings?	0
The existence of a loan?	17
The amount you borrowed?	15

known, the amounts of their savings are unanimously hidden. By contrast, the amount of the credit taken is usually known. It is worth noting that, for every loan taken at the cooperative, the borrower is given a "credit book," where the details of the loan and of the repayments made are indicated. Members reported showing their credit book to certify their financial obligations to suspicious relatives.[14] Note that even if saving passbooks could be observed, showing a zero balance would not necessarily be as credible a signal of financial difficulties. Indeed, members could choose to have a zero balance on their account while holding savings in other forms.[15] Moreover, incurring a loan implies a sequence of future payments that reduces the amount of income available for other uses, including demands for help.

Interviews with members also give some support to the mental account explanation of excess borrowing. Members consider their saving accounts and their credit obligations to be completely distinct. In their words, "When I withdraw money, I know that it is mine and I don't kill myself trying to reimburse." "If I withdraw money, I don't have the courage to reimburse because I think it is mine and I spend it. If I take a loan, I think that money belongs to someone else." "When I borrow, my heart says 'this is someone's money'; if I withdraw (from the saving account), I cannot force myself to save back because there are always problems." These excerpts indicate that some members consider these two types of transactions as belonging to two different types of accounts, as if they were managed by two different selves: the "accountant" self manages the savings and, once the loan is taken, is able to resist

---

[14] Interestingly, in one interview, the member explicitly mentioned that he refused to disclose the amount of his loans so as not to attract opportunistic or envious demanders.

[15] Our field survey indicates that most individuals in that area belong to multiple (mostly bidding) ROSCAS, of which the membership and the amounts are kept secret. The other main forms of liquid savings are stocks of food and savings accounts in other financial institutions.

the "shopper" self in using these to reimburse the loan. The shopper self is constrained in his expenses by his disposable income and the loan obligations. While we are not able to evaluate the relative importance of these two interpretations, our interviewees tend to report the signaling strategy much more often than the mental account argument.[16]

IV. A Model of Signaling

In this subsection, we briefly describe a signaling model to understand the conditions under which the above-described strategy is an equilibrium outcome. Consider n members of a credit cooperative and a demander soliciting financial help.[17] To allow for saving and credit, we assume that members live for two periods. In the first period they earn an uncertain income y_1 that takes one of three values $\{y - 2\delta, y, y + 2\delta\}$ with associated probabilities $\{\mu_p, \mu_m, \mu_r\}$. In the second period, all members earn the same level of income y. In each period, consumption and donation may be financed by income, saving, and borrowing.

We assume away discounting so that, in the absence of donation, each members' utility is given by $U = u(c_1) + u(c_2)$, where c_1 and c_2 represent his consumption in periods 1 and 2, respectively, and u is increasing and concave. We assume that saving earns no interest, but there is an interest rate on credit $r > 0$ that is paid in each period.

In each period, the demander has a cash need of D. In the first period, he chooses the member that he will solicit over the two periods. He can only make one such demand. He cannot observe the members' consumptions or savings. However, he observes whether or not they borrow from the cooperative. Donating reduces a member's consumption in each period by D but provides a joy of giving β per period, so that a member who has x available for consumption and is asked for a donation has a utility $u(x - D) + \beta$. Refusing has a per period utility cost α so that, if the member refuses to donate, his utility per period is $u(x) - \alpha$. Note that $[u(x - D) + \beta] - [u(x) - \alpha]$ is increasing in x, so that it is relatively less costly for richer agents to donate when asked. The latter feature is crucial for the mechanism described below.

[16] We cannot completely rule out the possibility that cooperatives encourage members to take loans rather than dissaving, even though, in separate interviews, managers mentioned that they do not encourage members to take loans if they have enough savings available, as it runs against the latter's interest.

[17] For simplicity, we assume n large so that $1/n$ has a negligible impact on the probabilities described below.

The precise timing of the game is as follows:

1. Period 1

    a) Income y_1 is realized.
    b) Members save or borrow.
    c) The demander selects a potential donor among the members and addresses his demand.
    d) The selected member chooses whether or not to make the donation D.
    e) Donation, interest payments, and consumption take place.

2. Period 2

    a) Income y_2 is realized.
    b) Donation, interest payment, and consumption take place.

Consider first a "poor" member who is hit by the bad shock, so that $y_1 = y - 2\delta$. In the absence of a request by the demander, he chooses to smooth consumption by borrowing δ and paying $r\delta$ in each period.[18] When asked for a donation, we assume that he always refuses:

$$u(y - \delta - \delta r) - \alpha > u(y - \delta - \delta r - D) + \beta.$$

Symmetrically a "rich" member hit by the good shock always chooses to save in order to smooth consumption. In the absence of a request, he saves δ and consumes $y + \delta$ in each period. We assume that, when asked, he always agrees to donate

$$u(y + \delta - D) + \beta > u(y + \delta) - \alpha.$$

Moreover, we assume that the joy of giving outweighs the cost of forgone consumption so that $u(y + \delta - D) + \beta > u(y + \delta)$.

Finally, let us call a member with no income shock a middle-class member. In the absence of donation, a middle-class member neither saves nor borrows and consumes y in each period. When asked, he chooses to donate. However, he would much prefer not to be asked at all:

$$u(y) > u(y - D) + \beta > u(y) - \alpha.$$

To summarize, for the poor, the cost of forgone consumption D exceeds the joy of giving, and he is better off not making the donation and bearing the cost of refusal. In contrast, the cost of forgoing D is lower than the joy of giving for the rich, who then prefers making a donation rather than consuming his

[18] We assume that the interest rate is low enough to make borrowing desirable: $2u(y - \delta - r\delta) > u(y - 2\delta) + u(y)$.

full revenue. Finally, the middle-class members donate when asked in order to avoid the cost of refusal. However, they prefer not being asked for a donation at all, since the joy of giving does not fully compensate for the forgone consumption.

On the other hand, the demander maximizes his chances of getting his request accepted. Since he cannot observe members' income, he bases his decision on the transactions he observes on the credit market. In all situations, the poor takes a credit and refuses to donate, while the rich takes no credit and agrees to donate. The existence of a loan therefore informs the demander about whether his request will be accepted or not. Given this, middle-class members may have an incentive to take a loan in order to mimic the poor and avoid being asked for a donation. However, interest payments make this signal costly. In addition, as the demander observes the credit amount, the middle-class member needs to borrow for the signal to be credible.

We are now in a position to describe the perfect Bayesian equilibrium of this game. The demander's beliefs are described by the probabilities $\pi = \{p_l, p_{nl}\}$, where p_l is the probability that the request is accepted, given that the demand was made to a member with a loan, and p_{nl} is the probability of acceptance, given that the demand was made to a member with no loan. In addition, let q_l stand for the probability for a member to face a demand if he has taken a loan and q_{nl} stand for the corresponding probability if he has not. There exists an equilibrium where all middle-class members take a loan if

$$
\begin{cases}
q_l[u(y - D - r\delta) + \beta] + (1 - q_l)u(y - r\delta) \\
\quad > q_{nl}[u(y - D) + \beta] + (1 - q_{nl})u(y) \\
\pi = \left\{ \dfrac{\mu_m}{\mu_p + \mu_m}, 1 \right\}.
\end{cases}
\tag{1}
$$

At this equilibrium, the demander solicits only members who do not take a loan, since it ensures that their demand will be accepted. Given this, a member who has a loan faces a zero probability of being asked for a donation: $q_l = 0$ and $q_{nl} = 1/\mu_r$. As a result, the first equation of condition 1 may be rewritten as

$$
u(y) - u(y - r\delta) < \frac{u(y) - u(y - D) - \beta}{n(\mu_r)},
$$

where the left-hand side represents the cost of taking a loan while the right-hand side represents the expected cost of donation. There exists another equilibrium where no middle-class member takes a loan if

$$\begin{cases} q_l[u(y - D - r\delta) + \beta] + (1 - q_l)u(y - r\delta) \\ \quad < q_{nl}[u(y - D) + \beta] + (1 - q_{nl})u(y) \\ \pi = \{0, 1\}. \end{cases} \tag{2}$$

Here again, all members who do not take a loan face a positive probability, q_{nl} of being solicited, where $q_l = 0$ and $q_{nl} = 1/(\mu_m + \mu_r)$. The first equation of condition 2 is thus

$$u(y) - u(y - r\delta) > \frac{u(y) - u(y - D) - \beta}{n(\mu_m + \mu_r)}.$$

It is worth noting that conditions 1 and 2 allow for the existence of multiple equilibria, which occur when both conditions are simultaneously satisfied:

$$n\mu_r < \frac{u(y) - u(y - D) - \beta}{u(y) - u(y - r\delta)} < n(\mu_m + \mu_r). \tag{3}$$

It is all the more likely that in this situation the proportion of poor members is small compared to the proportion of middle-class and rich members. In contrast, the signaling equilibrium where all middle-class members take a loan is unique when the proportion of poor members is large compared to the rich and middle classes: even when all middle-class members choose not to take a loan, they still face a high probability of a request. On the other hand, there is no signaling equilibrium when the proportion of poor members is very small, so that the chances of a request when one does not take a loan remains negligible.

Interestingly, field evidence suggests that poor members constitute an important part of the population. The proportion of members who take a loan even though they have enough savings to finance their project is relatively small compared to those members whose credit is essential to carry out their project. Moreover, insofar as having savings is an indicator of wealth, the first category of borrowers have much larger amounts of savings compared to the other borrowers. These findings are consistent with the signaling equilibrium just described.

V. Conclusion

From field observations of credit cooperatives in Cameroon, we find that a substantial number of members take loans even though they have enough liquidity in their savings account in the same institution. Nineteen percent of the loans observed fall into this category. The net interest paid for this strategy is equal to 24% per year. In-depth interviews with members of the cooperatives suggest a new possible rationale for this behavior. Members resort

to excess borrowing to signal to friends and relatives that they are too poor and do not have available savings. By doing so, they can credibly oppose requests made to them for financial help. This supports the idea that traditional solidarity obligations impose an important burden on individuals who manage to accumulate wealth.

The evidence provided in this article is mostly qualitative, and we are not able to formally test the idea that borrowing is used to signal liquidity constraints. To further substantiate this interpretation and test its importance relative to competing hypotheses, we intend in future research to collect systematic data, on the one hand, on extended family networks, traditional solidarity arrangements, and actual transfers and, on the other hand, the various forms of savings available in those societies. The idea would be to relate redistributive pressure to particular savings strategies and to document the deadweight losses involved. Moreover, to assess the relative performance of those strategies, we will measure the extent of information sharing, by collecting systematic cross-reporting of income and assets among family members. Detailed information on actual income and occupational patterns will also allow us to investigate the importance of moral hazard problems, along the lines of the Samaritan's dilemma (Coate 1995).

References

Anderson, Siwan, and Jean-Marie Baland. 2002. "The Economics of Roscas and Intrahousehold Resource Allocation." *Quarterly Journal of Economics* 117, no. 3: 963–95.

Basu, Karna. 2009. "A Behavioral Model of Simultaneous Borrowing and Saving." MPRA Paper, University Library of Munich.

Bertaut, Carol, and Michael Haliassos. 2002. "Debt Revolvers for Self Control." HERMES Center Working Paper no. 01-11, University of Cyprus.

Coate, Stephen. 1995. "Altruism, the Samaritan's Dilemma and Government Transfer Policy." *American Economic Review* 85, no. 1:46–57.

Gross, David B., and Nicholas S. Souleles. 2002. "Do Liquidity Constraints and Interest Rates Matter for Consumer Behavior? Evidence from Credit Card Data." *Quarterly Journal of Economics* 117, no. 1:149–85.

Gugerty, Mary K. 2007. "You Can't Save Alone: Commitment in Rotating Savings and Credit Associations in Kenya." *Economic Development and Cultural Change* 55, no. 2 (January): 251–82.

Kennedy, Paul. 1988. *African Capitalism: The Struggle for Ascendency*. Amsterdam: North-Holland, Elsevier Science.

Kinnan, Cynthia. 2009. "Distinguishing Barriers to Insurance in Thai Villages." Working paper, Massachusetts Institute of Technology, Cambridge, MA.

Laibson, Davis, Andrea Repetto, and Jeremy Tobacman. 2003. "A Debt Puzzle." In *Knowledge, Information, and Expectations in Modern Economics: In Honor of Edmund S.*

Phelps, ed. Philippe Aghion, Roman Frydman, Joseph Stiglitz, and Michael Woodford. Princeton, NJ: Princeton University Press.

Levine, Ross. 1997. "Financial Development and Economic Growth: Views and Agenda." *Journal of Economic Literature* 35, no. 2:688–726.

———. 2004. "Finance and Growth: Theory and Evidence." NBER Working Paper no. 10766, National Bureau of Economic Research, Cambridge, MA.

Miracle, Marvin P., Diane S. Miracle, and Laurie Cohen. 1980. "Informal Savings Mobilization in Africa." *Economic Development and Cultural Change* 28, no. 4 (July): 701–24.

Platteau, Jean-Philippe. 2000. *Institutions, Social Norms and Economic Development.* Amsterdam: Harwood.

Telyukova, Irina. 2009. "Household Need for Liquidity and the Credit Card Debt Puzzle." Working paper, University of California, San Diego.

Telyukova, Irina, and Randall Wright. 2007. "A Model of Money and Credit, with Application to the Credit Card Debt Puzzle." Working paper, University of California, San Diego.

Zinman, Jonathan. 2007. "Household Borrowing High and Lending Low under No-Arbitrage." Working paper, Dartmouth College.