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ALTERNATIVE FINANCIAL VEHICLES: ROTATING SAVINGS AND CREDIT ASSOCIATIONS (ROSCAs)

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Alternative Financial Vehicles: Rotating Savings and Credit Associations (ROSCAs)

Abstract

Where do immigrant groups without access to mainstream financial institutions find capital? Research on this subject has found alternative financial vehicles called rotating savings and credit associations (ROSCAs), which continue to be used today. These associations are found in the developing world and are popular among many immigrant groups in the United States. In addition to providing a short review of some of the literature on ROSCAs, this paper describes how ROSCAs work and discusses the benefits that accrue to ROSCA participants and some of the costs they incur. Of particular interest is the introduction of a partial data set collected from a local ROSCA, which offers a glimpse of the capital costs ROSCA participants face and which ultimately could be contrasted with the capital costs faced by borrowers at mainstream financial institutions.

Introduction

Minority businesses[1] as a share of U.S. small firms grew from 6.8 percent in 1982 to nearly 15 percent in 1997, according to a report released in November 2001 by the U.S. Small Business Administration. These numbers are particularly interesting in light of efforts by community and government organizations to increase access to capital for minority groups, whose members may be unable to meet the credit criteria set by financial institutions. Despite such constraints on access to mainstream sources of capital, the growing number of minority-owned businesses suggests that other avenues to capital may also exist.

In addition to family, friends, and personal savings, studies of entrepreneurial activity cite other forms of informal finance as a means to obtaining the capital needed to start or continue to run a business. While informal finance serves as a catch-all phrase to include capital not obtained through mainstream financial institutions and may suggest an unregulated and unruly sector, evidence suggests that the informal sector can be quite sophisticated. In fact, since at least the early 1960s, research into the networks of minorities has found a system of savings and credit based on an individual's social connections known as rotating savings and credit associations (ROSCAs), which continue to be used today.

ROSCAs: What They Are and How They Work

In "The Comparative Study of Rotating Credit Associations," Shirley Ardener in 1964 described a rotating credit association as "an association formed upon a core of participants who agree to make regular contributions to a fund which is given, in whole or in part, to each contributor in rotation" (Ardener, 1964, p. 201). These informal associations, composed of a group of closely knit people, usually family or friends, have appeared in many parts of the world, including South America, Africa, and Asia. One source contends that some form of economic cooperation may have existed as early as 200 B.C. in China.[2] (For a list of countries where ROSCAs appear, along with the names given to them by local participants, see the Appendix.) ROSCAs permeate the world landscape, appearing in rural villages, where there is a lack of formal financial infrastructure; in developing countries, where the formal sector is nascent or corrupt; and even in developed countries as an alternative to mainstream financial institutions.[3]

ROSCAs serve both an economic and a social function. Their primary purpose is to pool funds from multiple participants in order to achieve certain financial goals. In addition to ROSCAs' economic aspects, ROSCA meetings also provide opportunities for feasting, drinking, and networking. In many places, meetings proceed in a ritualistic manner, according to the social customs of the group. At ROSCAs (called djanggi) in

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[1] Minority businesses include those owned by African-Americans, Asians, American Indians, Alaska Natives, Native Hawaiians, Other Pacific Islanders, Hispanics, and other races, as defined by the U.S. Census Bureau.

[2] This was translated from German to English from the following source: "Intermediation der Wohnungsfinanzierung: Vom kollektiven Zwecksparen zur Kreditverbriefung" Schirmeister/Nadler in WiSu 5/98. See http://www.lbs.de/bw/english/bausparen/historical-development.

[3] Stefan Klonner and Ashok Rai describe more structured ROSCAs in India; see Klonner and Rai (January 2004) and Klonner and Rai (October 2003).

West Cameroon, for example, participants exchange greetings and share kola nuts while reserving drinking until after the day's business affairs have been settled (Bouman and Harteveld, 1976, p. 108). With so many groups and subgroups participating in these credit associations, ROSCAs are complex and vary according to the needs of their members. Despite all of the idiosyncratic variations, however, ROSCAs routinely follow the same paradigm: A group of people assemble, usually at the behest of a leader or organizer. This organizer may be the person with the most extensive financial background, or he may be the person in need of a loan. The individuals in this group – usually 10 to 12 people, but it may include upward of 300 – meet regularly and contribute a predetermined fixed amount to a universal fund, which rotates at regular intervals to each participant in turn.

The number of ROSCA participants, the regularity of the meetings, and the fixed amount contributed are determined based on the needs of the group. For example, if the ROSCA is established because the organizer requires a lump sum of $1000, the organizer may gather nine people whom he believes to be credible and trustworthy and may require that each participant, including the organizer himself, contribute a fixed amount of $100 at each meeting. At the end of the first meeting, the organizer will be able to take home his lump sum of $1000. Another member, according to assignment, will take home the $1000 collected in the following meeting. This continues until everyone has had a turn with the pot. If meetings are held monthly, the ROSCA will last 10 months, after which the ROSCA disbands.

The order of rotation in which participants obtain the funds can be determined in a number of ways. Normally, the organizer, in exchange for undertaking the administrative duties of organizing the ROSCA, will receive the pot first. Some ROSCAs rotate the funds to the remaining members by random assignment. Others determine the order of assignment based on the social stature of the participants. (Those with the highest social standing obtain the pool of funds in the beginning rounds.) Finally, some ROSCAs determine the order of rounds based on a system of bidding. According to Besley, Coate, and Loury, ROSCAs that rotate funds based on random assignment can generally be referred to as random ROSCAs, while ROSCAs that rotate funds based on a system of bidding can be referred to as bidding ROSCAs (Besley, Coate, and Loury, 1993, pp. 792-793). Bala Shanmugam (1989, pp. 354-358) prefers to call them the simple and discounting ROSCA respectively. Shanmugam (1989, p. 356) also describes a consumer durable ROSCA, which functions, for the most part, like a simple ROSCA.

Types of ROSCAs

In a **simple** or **random ROSCA**, each individual contributes a predetermined fixed sum to a universal fund (Table 1). In this particular example, the organizer, who requires $500, assembles a group of four participants. The organizer receives the first pool of money, which totals $500, in the first rotation. Then according to random assignment, the fund rotates to another participant at each meeting, until every member has had a turn at the $500 pot. In the random ROSCA, the contributions are fixed, and everyone contributes the same amount at each meeting and receives the same size pool when his turn arrives to collect. By the end of the ROSCA, everyone will have received, in lump sum, the total of their monthly contributions. In that sense, there is no net gain or loss for any participant.

Table 1
ROSCA system based on five participants with monthly payments of $100

Members	Contributions by Month (in dollars)					Total Paid	Difference in Amount Received Less Paid = Net Gain (Loss)
	t_1	t_2	t_3	t_4	t_5		
P1 (Organizer)	100	100	100	100	100	500	0
P2	100	100	100	100	100	500	0
P3	100	100	100	100	100	500	0
P4	100	100	100	100	100	500	0
P5	100	100	100	100	100	500	0
Total Received	**500**	**500**	**500**	**500**	**500**	**2500**	

Note: Shaded cells represent the period in which the participants received the pot.
Source: This table contains exemplary data provided by the author and uses a table format similar to one used by Shirley Ardener in "The Comparative Study of Rotating Credit Associations" (Ardener, 1964, p. 214).

The **consumer durable ROSCA**, popular among women, is a slight variation on the random ROSCA. As in the random ROSCA, the organizer assembles a group of people who contribute a fixed amount to the fund. Instead of rotating a lump sum of funds, however, participants receive a physical good, such as a dishwasher or a grain mill, that the group has agreed upon at the beginning of the ROSCA (Shanmugam, 1989, p. 356). The organizer usually obtains a discounted price for the goods in exchange for the guaranteed purchase of a certain number of goods in the coming months (Shanmugam, 1989, p. 356). Thus, participants in consumer durable ROSCAs can attain the purchasing power necessary to negotiate goods at a lower price.

Discounting or **bidding ROSCAs** use bidding as a means of determining the order by which participants receive the pot. As in the random ROSCA, the organizer, in exchange for assembling the participants, receives the pot first. To generate a pot of $1000, for example, the organizer would gather nine other participants and require that each (plus himself) contribute $100 monthly. At the end of the first rotation of contributions by the 10 participants, the organizer receives the $1000 pot (including $100 of his own funds).

To determine the order in which the participants would receive the pot, a system of bidding is introduced in the subsequent rounds. At the beginning of each rotation, the organizer contacts the participants who have not yet received the pot in order to obtain bids for the round. A participant's bid amount is the amount of each other potential bidder's monthly contribution that the bidding participant is willing to forgo in exchange for early receipt of the pot. The person who submits the highest bid for the rotation receives the

pot. The highest bid amount for the round, therefore, translates into a discount for some of the participants: Rather than contributing the fixed amount determined at the outset of the ROSCA ($100), each participant who has not yet received the pot pays a discounted amount that equals the fixed amount less the bid amount. ROSCA participants who have already received the pot, however, are ineligible for the discounts in subsequent rotations and continue to pay the original amount (Table 2). The combined amount generated in a particular rotation from both types of participants goes to the rotation's highest bidder.

Table 2
ROSCA bidding system based on 10 participants with monthly payments of $100

Members	Contributions by Month (in dollars)										Total Paid	Difference in Amount Received Less Paid= Net Gain (Loss)
	t_1	t_2	t_3	t_4	t_5	t_6	t_7	t_8	t_9	t_{10}		
High Bid		25	20	25	20	25	20	25	20			
P1 (Organizer)	100	100	100	100	100	100	100	100	100	100	1000	0
P2	100	100	100	100	100	100	100	100	100	100	1000	(200)
P3	100	75	100	100	100	100	100	100	100	100	975	(115)
P4	100	75	80	100	100	100	100	100	100	100	955	(105)
P5	100	75	80	75	100	100	100	100	100	100	930	(30)
P6	100	75	80	75	80	100	100	100	100	100	910	(10)
P7	100	75	80	75	80	75	100	100	100	100	885	55
P8	100	75	80	75	80	75	80	100	100	100	865	85
P9	100	75	80	75	80	75	80	75	100	100	840	140
P10	100	75	80	75	80	75	80	75	80	100	820	180
Total received	**1000**	**800**	**860**	**850**	**900**	**900**	**940**	**950**	**980**	**1000**	**9180**	**0**

Note: Shaded cells represent the period in which the participants received the pot.
Source: The example in this table is based on an interview with a Chinese and a Cambodian ROSCA participant.

Table 2 shows, horizontally, the monthly payment stream of each participant for the 10-month time frame. Shown vertically is the payment received by the highest bidder from the other participants in his respective rotation. The highest bidder of each round is shown sequentially, as illustrated by the shaded boxes (P1 receives the pot in t_1, P2 receives the pot in t_2, P3 receives the pot in t_3, etc.). For illustrative purposes,

Table 2 also assumes that the highest bid for each rotation is $25 or $20, respectively, depending on the rotation. In reality, the amount of the bid would vary according to the participants' preferences.

In this particular type of bidding ROSCA, the effects of discounting are illustrated clearly in the above table. As mentioned earlier, only participants who have not received the pot are eligible for the discount. Notice that the payment amounts to the left of the shaded cells show an amount less than the fixed amount ($100), except in the second round (t_2). Once a participant has received his turn at the pot, his subsequent monthly contributions revert to the fixed amount ($100), as can be seen in the cells to the right of the shaded cells in Table 2. For example, P5 received the pot at t_5. So for the rotations between t_1 and t_5, P5 contributes a discounted amount. After t_5, however, his contributions are fixed at $100.

Table 2 suggests that both the bid amount and the time frame in which ROSCA participants receive their pot affect their financial experience in the ROSCA. For example, the amount of a participant's bid directly affects the resulting size of that participant's pot: A high bid amount translates into a smaller pot amount and a low bid amount translates into a larger pot amount. (Compare P2's pot of $800, as a result of a high bid of 25, and P3's pot of $860, as a result of a high bid of $20.) Additionally, P2, P4, P6, and P8 all received pots based on bid amounts of $25, yet their pot amounts differ because of the time frame in which they received the pot. Specifically, despite identical bid amounts, participants who received the pots in later rounds received a larger pot. (Compare P2's pot of $800 to P8's pot of $950.) The dynamics of the bid amount and timing will be the subject of the next section.

Another pattern that emerges from Table 2 can be seen in the last column of the table, *Difference in Amount Received Less Paid = Net Gain (Loss)*, which simply presents the difference between the total amount received by each participant and the total amount paid. It appears that those receiving the pot in the earlier rounds paid more into the ROSCA than they received, while those receiving the pot in the later rounds paid less into the ROSCA than they received.[4] This pattern suggests that in a bidding ROSCA, there are borrowers and lenders of capital.

At one extreme is the person who organized the ROSCA (participant P1 in the above example), who obtains the pot for his efforts at what is effectively a zero rate of interest. At the other extreme is the last person to receive the pot (participant P10 in the above example), who has essentially lent money in each of the previous periods to the other participants. Each participant between these extremes might be thought of as a lender up to the point he receives the pot and a borrower thereafter. Or one might think of the participants who have a net loss in the last column of Table 2 as, on balance, borrowers, and those with a net gain as lenders. In this case, participants receiving the pot early in the cycle of awards in a bidding ROSCA would tend to fall toward the borrowing end of the spectrum compared with those receiving the pot late in the cycle of awards.

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[4] Note that this is not the case in a random ROSCA.

The Random and Bidding ROSCA: Savings or Lending Mechanisms or Both?

It is difficult to envision a random ROSCA as a series of loans and debt repayments, since (as shown in Table 1) none of the participants will show a difference between the total amounts paid and received (i.e., no net gain or loss). Although clearly the organizer who obtains the pot in the first round is effectively receiving an interest-free loan, it is not clear how best to think of the experience of the other participants. All of the participants except for the organizer begin the ROSCA as lenders, not borrowers, and the cost of their doing so is simply the opportunity cost of not using their funds to invest in some alternative financial instrument. One could think of this as the interest rate on a bank savings account or on a marketable instrument such as a Treasury security. Of course, participants in ROSCAs may not have access to traditional financial institutions that offer such alternative financial investments, so realistically there may not be a large opportunity cost to ROSCA participants. After the first round, participants in a truly random ROSCA have an equal chance of getting the pot in the second round. But it is not clear that obtaining the pot in this fashion is best thought of as a loan. Random ROSCAs may best be thought of as a type of forced saving, rather than as a series of loans.

In contrast, the bidding ROSCA illustrated in Table 2 suggests that bidding ROSCAs combine elements of lending and borrowing. It is easier to think of the recipients of the pot in the early rounds of this type of ROSCA as, on balance, borrowers. Nevertheless, participants in a bidding ROSCA will not know ex ante what the sum of their payments will be over the life of the ROSCA, so it is not clear how to compare ex ante a person's decision to join a bidding ROSCA with the alternative of borrowing funds from a mainstream financial institution and making regular monthly loan payments. Participants in a bidding ROSCA who successfully obtain the pot in the early rounds will know that their future payments are fixed *after* they receive the pot, but they do not know at the time they decide to join the bidding ROSCA what their total payments will be – nor is it clear how well such payments could be predicted by participants. After the pot is awarded, however, the bidding ROSCA described here requires the winning participants to make future contributions at the original level, so that at least in this ex post sense, the winning bidder will know his stream of total payments at the time he wins the pot, which might then be compared to what he would have had to pay had he taken out a loan from a financial institution for a similar amount.

Although comparing the ex post cost of ROSCA participation with a market-based alternative source of funds is not a totally satisfying approach, it may still be instructive to consider how one could construct such a comparison. One approach is to think of the payments into the ROSCA up to the time the pot is received as "upfront fees" that must be paid to eventually receive the pot. Once the pot is received, the recipient's future payments each period return to the original initial amount ($100 in Table 2), and one could then determine the interest rate that would be consistent with making those remaining payments in return for obtaining the net proceeds of the pot minus the previously paid fees. (This will somewhat underestimate the interest rate, since it ignores the fact that the participant has forgone earning interest on the earlier ROSCA payments – although ROSCA participants may not have access to such alternative investments.) By calculating the resulting interest rate as if the net funds received were a loan, this exercise at least provides some insight into whether the ex post cost of participating in a ROSCA is wildly out of line with what the successful bidder would have faced had he approached a traditional financial institution for a loan.

So if one thinks of bidding ROSCAs as a series of loans and debt service payments among the participants, the key question is whether we can calculate an estimate of the costs associated with obtaining capital through ROSCAs. If so, can we then compare them to the costs of accessing capital from mainstream financial institutions? The next section explores these issues in more detail using some actual data from a bidding ROSCA to provide some insight into how one might think of such borrowing costs.[5] In an effort to learn more about actual costs faced by ROSCA participants, the next section introduces primary data collected from a 40-member bidding ROSCA operating in an Asian community located in Philadelphia.

Cost of Capital: Using the Equation of Net Present Value

As a result of its distinct financial characteristics, calculating the cost of capital for participants in ROSCAs is challenging. Compared to an amortizing mortgage or auto loan, ROSCA loans are paid out to participants (except P1) after participants begin paying into the ROSCA. In the case of the bidding ROSCA, participants make uneven monthly payments as a result of the bidding process.

One approach to accounting for these distinct characteristics is to modify existing financial equations that estimate the interest cost of borrowing funds. With a typical loan, a borrower receives the full disbursement of the loan in the first period (t_1), and he repays the loan in periodic, even payments. Using the equation for net present value, the usual approach to finding a loan interest rate is to set the amount of the loan received (which is normally received before payments begin) equal to the sum of the discounted present values of the monthly loan payments made for the term of the loan. For instance, for a four-month loan:

$$\text{Loan Amount} = \frac{PMT}{(1+i)^1} + \frac{PMT}{(1+i)^2} + \frac{PMT}{(1+i)^3} + \frac{PMT}{(1+i)^4}$$

where PMT is the fixed monthly payment amount, and i is the monthly interest rate for which we are solving. Knowing the loan amount, the term of the loan, and the equal monthly payment amounts, one can use a book of amortization tables or a financial calculator to find the loan interest rate (which is usually reported as a rate per annum by annualizing the monthly interest rate).

Borrowers in a ROSCA, however, begin paying into the ROSCA in the first period (t_1) and, except for the participant who receives the pot in t_1, do not receive a "loan" until some later time (call it *k*). Moreover, the monthly payments of participants in a bidding ROSCA are not all equal. Only after participants receive their pot do their monthly payments become regular (and equal to the original initial contribution amount). As a result, the most common formula for calculating a loan interest rate does not apply to most ROSCA participants.

However, because the participants are committing to participate in the ROSCA in the first period (even though they do not receive the pot until later), one approach is to treat the payments made before the

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[5] Some researchers, however, have questioned whether thinking about a ROSCA as a series of mutual loans and debt service payments matches up with how ROSCAs operate. One alternative view is that ROSCAs are a form of collective action rather than a series of mutual loans and debt service payments. (See Callier, 1990, p. 274.) Some researchers suggest ROSCAs are a form of insurance. See, for example, Calomiris and Rajaraman (1998) and Klonner (2003) or Klonner (2000).

pot is received as "upfront fees" that reduce the gross proceeds of the "loan" amount received in a future period *k*. This approach would modify the above equation. For instance, in a bidding ROSCA that lasts four months, consider the participant who receives the pot in the second period, after already making a payment in the first period, call it PMT_1. Then the loan amount is paid back in the following three periods and the equation is solved for the monthly interest rate, i, using:

$$\text{Net Loan Amount} = (\text{Pot} - PMT_1) = \frac{PMT}{(1+i)^1} + \frac{PMT}{(1+i)^2} + \frac{PMT}{(1+i)^3}$$

Again, knowing the net loan amount, the term of the loan, and the equal monthly payment amounts, one can use a book of amortization tables or a financial calculator to find the loan interest rate per annum.[6] We now turn to applying this type of approach to some actual data.

The Bid Amount: Partial Data from a Local ROSCA

To explore actual capital costs faced by ROSCA participants and to better understand the dynamics of bidding, the Federal Reserve Bank of Philadelphia is collecting data on a 40-member ROSCA that began in October 2003 in an Asian community in Philadelphia. This bidding ROSCA required members to initially contribute $1000 and up to $1000 monthly for each of its 40 months. But it also allows the actual monthly payments contributed by participants to be less than the $1000 initial amount, based on the bids of the participants who want to obtain the pot each month, as illustrated below. Because the ROSCA will continue for 40 rounds, the data collection process will not conclude until early 2007; however, data collected from the first seven rounds are presented in Table 3.

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[6] Another approach might be to equate the present value of the pot (which in this approach would then be treated as the loan amount) with the sum of the present values of all the monthly payments into the ROSCA and find the monthly interest rate (i) consistent with this equation. To do so, however, one has to assume some discount factor (interest rate r) to calculate the present value (in t_1) of the pot received in a future period (k) using the following equation:

$$\text{PVpot} = \frac{\text{Pot Amount}}{(1+r)^k}$$

Presumably this rate r would be different from i and reflect what the participant could have earned on an alternative investment. Like the "upfront fees" approach, this approach also relies on the view that the participants are committing to participate in the ROSCA in the first period even though they do not receive the pot until later. One difficulty with this approach, however, is that different assumed discount factors (r) will yield different results for i.

Table 3
ROSCA bidding system based on 40 participants (first seven rounds)

Members	Contributions by Month (in dollars)								Total Paid	Difference in Amount Received Less Paid = Net Gain (Loss)
	t_1	t_2	t_3	t_4	t_5	t_6	t_7	t_8 - t_{40}		
High Bid	0	65	105	110	100	50	65	*b*		
P1	1000	1000	1000	1000	1000	1000	1000	33,000	40,000	0
P2	1000	1000	1000	1000	1000	1000	1000	33,000	40,000	(2,470)
P3	1000	935	1000	1000	1000	1000	1000	33,000	39,935	(3,820)
P4	1000	935	895	1000	1000	1000	1000	33,000	39,830	(3,790)
P5	1000	935	895	890	1000	1000	1000	33,000	39,720	(3,220)
P6	1000	935	895	890	900	1000	1000	33,000	39,620	(1,320)
P7	1000	935	895	890	900	950	1000	33,000	39,570	(1,715)
P8-P40	33,000	30,855	29,535	29,370	29,700	31,350	30,855			
Total Received	40,000	37,530	36,115	36,040	36,500	38,300	37,855			

Note: Shaded cells represent the period in which the participants received the pot.
Note: *b* represents the highest bid amounts for rounds t_8 - t_{40} , for which not all the data have yet been collected.
Source: This table contains data collected from the first seven rounds of a local ROSCA, which began in October 2003.

Table 3 is organized along the same lines as Table 2. Each participant's monthly payment stream is illustrated horizontally, while each participant's contribution to the pot of the highest bidder is illustrated vertically. For the later rounds (t_8 through t_{40}), the monthly amounts contributed by each of the first seven participants are illustrated as an aggregate amount ($33,000). This amount can be determined because, in this ROSCA, participants who have already received the pot are no longer eligible for any discounts. Since participants P1 through P7 received their turn at the pot before period t_8, their subsequent monthly contributions will be $1000 for the last 33 rounds.

In a similar vein, the pot amount obtained by the highest bidder in periods t_1 through t_7 can also be determined once the bid amount and the order of rotation have been determined. For those who have not yet received their turn at the pot, their monthly contribution is an amount equal to the initial fixed amount ($1000) less the bid amount of the particular rotation. Since P8 through P40 will not receive the pot until after t_7, the sum of their monthly contributions for each period t_1 through t_7 can be calculated, as shown in the second to last row of Table 3.

The modified equation for the net loan amount can be used to show each bidding ROSCA participant's payment stream and the pot amount net of the sum of the "upfront fees" paid before receiving the pot.

Table 4
Modified equation for net loan amount in a bidding ROSCA

Value of pot minus sum of contributions paid before receiving the pot = Sum of the discounted present values of monthly contributions made by each participant over the remaining term of the ROSCA (n). The monthly interest rate is denoted by i.

$$\text{Net Loan Amount} = \text{Pot - Fees} = \frac{PMT}{(1+i)^1} + \frac{PMT}{(1+i)^2} + \ldots + \frac{PMT}{(1+i)^n}$$

P1:	39,000	=	$\frac{1000}{(1+i)^1}$	+	$\frac{1000}{(1+i)^2}$	+	$\frac{1000}{(1+i)^3}$	+	. . .	+	$\frac{1000}{(1+i)^{39}}$	
P2:	35,530	=	$\frac{1000}{(1+i)^1}$	+	$\frac{1000}{(1+i)^2}$	+	$\frac{1000}{(1+i)^3}$	+	. . .	+	$\frac{1000}{(1+i)^{38}}$	
P3:	33,180	=	$\frac{1000}{(1+i)^1}$	+	$\frac{1000}{(1+i)^2}$	+	$\frac{1000}{(1+i)^3}$	+	. . .	+	$\frac{1000}{(1+i)^{37}}$	
P4:	32,210	=	$\frac{1000}{(1+i)^1}$	+	$\frac{1000}{(1+i)^2}$	+	$\frac{1000}{(1+i)^3}$	+	. . .	+	$\frac{1000}{(1+i)^{36}}$	
P5:	31,780	=	$\frac{1000}{(1+i)^1}$	+	$\frac{1000}{(1+i)^2}$	+	$\frac{1000}{(1+i)^3}$	+	. . .	+	$\frac{1000}{(1+i)^{35}}$	
P6:	32,680	=	$\frac{1000}{(1+i)^1}$	+	$\frac{1000}{(1+i)^2}$	+	$\frac{1000}{(1+i)^3}$	+	. . .	+	$\frac{1000}{(1+i)^{34}}$	
P7:	31,285	=	$\frac{1000}{(1+i)^1}$	+	$\frac{1000}{(1+i)^2}$	+	$\frac{1000}{(1+i)^3}$	+	. . .	+	$\frac{1000}{(1+i)^{33}}$	

Solving for the monthly i with the assistance of a financial calculator and expressing the result as an annual interest rate yields the estimated annual interest rates shown in the last column of Table 5.[7]

[7] A Texas Instruments BAII Plus advanced financial calculator was used. Since the construction of the net loan amount for this bidding ROSCA leaves equal monthly payments to be made after the pot is received, determining i and expressing it as an annual interest rate is no different from what can be found in books of amortization tables.

Table 5
Estimated ex post capital cost per annum for the participants of a bidding ROSCA assuming payments before receiving pot are "upfront fees"

Member	High Bid	Pot	Upfront "Fees" (paid before receiving pot)	Net "Loan" Amount	Term of Loan (Months)	Ex Post Capital Cost (per annum)
P1	0	$40,000	$1,000	$39,000	39	0.0%
P2	65	$37,530	$2,000	$35,530	38	4.19%
P3	105	$36,115	$2,935	$33,180	37	7.03%
P4	110	$36,040	$3,830	$32,210	36	7.37%
P5	100	$36,500	$4,720	$31,780	35	6.55%
P6	50	$38,300	$5,620	$32,680	34	2.74%
P7	65	$37,855	$6,570	$31,285	33	3.81%

As illustrated earlier in Table 2, Table 5 shows the effect of the bid amount and the time frame in which the pot is received – which in turn reflects the time value of money. As the bid amount increases, the pot is smaller and the cost increases, as reflected in the higher level of the ex post capital cost per annum.

Take, for example, P2 and P3, whose high bids were $65 and $105, respectively. These bid amounts translate into ex post annual interest rates of 4.19 percent and 7.03 percent. However, the interplay of the bid amount and time also affects participants. Compare, for example, P2 and P7, who both placed high bids of $65, but in rounds 2 and 7, respectively. P2 faced a higher cost for his loan (4.19 percent per annum) than P7 (3.81 percent per annum). Intuitively, this makes sense because P7 benefited from the discounts that were applied to his monthly contributions in the rounds before he received the pot (even though the term of the loan is shorter by four months).

The above exercise provides some benchmark for how to think about the cost of obtaining funds by participating in a ROSCA. But admittedly the logic of the exercise is more likely to apply to those participants who receive the pot in the early rounds of the ROSCA. Its logic is less applicable to participants who obtain the pot in the late rounds of the ROSCA because they seem more like lenders than borrowers. So it would be helpful to have another, more general approach.

Cost of Capital: Using Cash Flows and Internal Rates of Return

One possibility is to treat ROSCA payments and the pot as a series of cash flows and then determine the internal rate of return associated with each person's ROSCA participation.[8] As with the earlier approach, this cash flow approach can be done only ex post, not ex ante. So, like the "upfront fees" approach, the cash flow approach also suffers from not being able to compare participation in a ROSCA ex ante with borrowing from a mainstream financial institution. Nevertheless, looking at whether the ex post internal rates of return are far out of line with the earlier approach or with market-based rates of return may still provide some per-

spective on whether participating in a ROSCA is wildly out of line with participating in mainstream financial markets.

However, since the cash flows during the entire life of the ROSCA are known only to those who have already received the pot in a bidding ROSCA, we again are restricted to doing a cash flow and internal rate of return exercise for only the early rounds of the ROSCA outlined in Table 3. As before, whether this approach will make sense for participants who receive the pot in the later rounds is not clear.

In this approach, the sum of the discounted cash flows are set equal to zero, as follows:

$$-CF_0 + \frac{-CF_1}{(1+i)^1} + \frac{-CF_2}{(1+i)^2} + \ldots + \frac{(Pot-CF_k)}{(1+i)^k} \ldots + \frac{-CF_{40}}{(1+i)^{40}} = 0$$

where $-CF_t$ is the payment to the ROSCA in month t, Pot is the pot amount received in month k, and i is the internal rate of return that equates the sum of these discounted cash flows to zero. The ROSCA lasts 40 months. The first payment is $1000 and so are the payments made in the month the pot is received and in the months after the pot is received. The payments between the first month and the month the pot is received are lower than $1000 by the amount of the bids shown in Table 3. For instance, in the second month the cash flow is –($1000 – $65) = -$935. Cash flows are uneven in this bidding ROSCA, which must be taken into account when calculating the internal rate of return with a financial calculator.[9] The results of this exercise for the first seven participants in the ROSCA are shown in Table 6 by solving for the monthly internal rate of return with the assistance of a financial calculator and expressing the result as an annual rate.

Table 6
Ex post internal rates of return estimated for participants of a bidding ROSCA

Members	High Bid	Pot	Internal Rate of Return (per annum)
P1	0	$40,000	0.0%
P2	65	$37,530	4.19%
P3	105	$36,115	7.06%
P4	110	$36,040	7.44%
P5	100	$36,500	6.67%
P6	50	$38,300	2.81%
P7	65	$37,855	3.96%

[8] Eeckhout and Munshi (2005) discuss using an internal rate of return framework to find a method for calculating an implicit interest rate within a given bidding ROSCA. They propose finding a within-group interest rate between participants winning the pot in the second round and those obtaining the pot in the final round. Since our ROSCA data have yet to reach the final round, we have insufficient data to use the Eeckhout and Munshi approach. But we can at least consider the internal rates of return for those ROSCA participants who have already received the pot as an alternative benchmark.

[9] A Texas Instruments BAII Plus advanced financial calculator was used.

For each participant in this bidding ROSCA, these internal rate of return figures are equal or close to the earlier "loan" interest rates calculated in Table 5 using the earlier "upfront fees" approach. The different bid amounts lead to a wide range of ex post internal rates of return, with higher bid amounts associated with higher internal rates of return.

Bidding ROSCA Behavior and Comparisons with Market-Based Interest Rates

The partial data set presented on the bidding ROSCA provides a fascinating glimpse into the workings of an alternative financial vehicle, where the behavior of the participants has yet to be explored. One would expect, for example, that borrowers would like to receive the pot by submitting a low bid, in order to maximize the size of the pot. Other ROSCA members, however, would like the winning bidder to submit a high bid, in order to maximize the size of the monthly discount. Because bids are placed without necessarily knowing the capital needs of other ROSCA members, they can vary from round to round, and as a result, the ex post interest rate can be low in one round and high in the next. One might find that in the same ROSCA, some participants could receive what would amount to "prime" loans, while others could receive "subprime" loans. Because of the fluid nature of ROSCAs and the monthly bidding process, a participant may not necessarily know beforehand what type of borrower he or she will be.

These issues will be explored in greater detail once the full data are collected on the bidding ROSCA. However, the data collected so far and the use of the modified equation for the net loan amount allow for some insight into the ex post costs of participating in a ROSCA, as compared to other forms of borrowing.

For example, participants in the bidding ROSCA's first seven rounds experienced ex post interest rates ranging from 2.74 percent to 7.37 percent per annum using the "upfront fees" approach and interest rates ranging from 2.81 percent to 7.44 percent per annum using the cash-flow internal rate of return approach.[10] Taken at face value, this suggests that, for some participants, the cost of accessing capital from a ROSCA is cheaper than accessing capital from mainstream financial institutions, while for others the cost of capital is higher. To compare, short-term rates on three-month bank certificates of deposit were close to 1.0 percent during the first seven rounds of the bidding ROSCA, which was between October 2003 and April 2004, while prime rates for commercial and industrial loans were 4.36 percent, according to the Survey of Terms of Bank Lending of November 2003.[11] For small loans – those between $1,000 and $99,000 – prime rates were 5.0 percent. For consumer loans, the prime rates for a 48-month new car loan at a commercial bank were 8.5 percent, and 13.22 percent for a 24-month personal loan, according to the 2003 Federal Reserve statistical release on consumer credit.[12] Banks normally price their commercial and consumer loan products several percentage points over the prime rate. In contrast, payday lenders have been known to charge upward of 300 percent for their short-term loans.

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[10] Ignoring the 0 percent interest rate obtained by the organizer of the ROSCA in the initial round.

[11] Federal Reserve Statistical Release E.2 Survey of Terms of Business Lending can be found at http://www.federalreserve.gov/releases/e2/.

[12] Federal Reserve Statistical Release G.19 Consumer Credit can be found at http://www.federalreserve.gov/releases/g19/.

It is apparent from the literature and from conversations with ROSCA members that ROSCA participants are motivated not only by considerations of cost but also by considerations of social relationships and standing, as well as other economic benefits. This becomes especially important when trying to understand why participants continue to make monthly contributions even after they have received the pot. These considerations will be discussed in the next section.

What Makes It Work: Social Capital and Other Economic Benefits

Social Capital

ROSCAs, like banks, make the decision to originate a loan to a borrower based on certain information. Banks arrive at a credit decision by assessing the borrower's credit history, current income, and available collateral. This process is highly efficient and allows financial institutions, on a large scale, to assess the creditworthiness of individuals with whom they haven't had previous relationships. ROSCAs, in contrast, rely on a person's social capital to assess a participant's creditworthiness. Social capital, a concept coined by Glenn Loury in 1977, represents "the consequences of social position in facilitating individual acquisition of (say) the standard human capital characteristics" (Loury, 1977, p. 176). In regard to ROSCAs, a person's social capital is the basis of his or her creditworthiness and can grant him or her access to capital. Most ROSCA members are personally acquainted with each other and are generally part of the same community. As a result, a participant's current and previous economic status, as well as his commitment to meeting his financial obligations, is generally known.

The reliance on social capital to create a functioning ROSCA is evident in the anecdotal literature. ROSCA participants depend on social capital to assess financial risk and viability; to promote forced savings, networking, and information-gathering; and finally, to create the group pressure that will guarantee continued commitment. Each of these will be described below.

Assessing financial risk. In most ROSCAs, as in our bidding example in Tables 2 and 3, organizers employ social capital to recruit individuals from their own social network whom they can depend on to meet financial commitments. Participants, on the other hand, will agree to join ROSCAs as long as they view the organizer as credible and trustworthy. This credibility must extend to the organizer's ability to choose equally honest and reliable individuals to join the ROSCA and to perform the administrative tasks associated with collecting funds and ensuring payment, even if it means assuming the payments of a defaulting member. Participants must also trust that the organizer will not disappear with the funds after the first rotation.

In some cases, ROSCAs will allow new members of the community to join; however, membership will be granted based on references or at the recommendation of an existing member. In other traditions, new members must first demonstrate their creditworthiness to the community. For example, new members might receive the pot toward the last rounds and move up in the pecking order once they have shown their creditworthiness (Bouman and Harteveld, 1976, p. 110).

Forced savings, networking, and information-gathering. Some participants regard ROSCAs' emphasis on social capital as a means of self-discipline where savings are concerned. Because maintaining one's social capital is necessary to obtain future access to credit, participants join ROSCAs as a way to compel themselves

to make the monthly payments and, hence, to save. Many participants point to the ease with which a person could discontinue making monthly payments to financial institutions because of the lack of social consequences. In contrast, not only would a defaulting ROSCA member endanger his future access to credit, participants also understand that their default would directly correlate with another member's not being able to obtain the funds necessary for some transaction.

Participants also cite altruistic motivations for joining ROSCAs, particularly random ROSCAs. Participants feel that their contributions assist members of their own community who may be in need of a lump sum of money to make a down payment on a house, to pay for a wedding or college tuition, or to make large purchases, such as furniture for a home.

Finally, ROSCAs facilitate social networking and information exchange. As mentioned previously, many ROSCA meetings involve ritualistic practices and social observances. They also provide opportunities for participants to network, to support each other in economic endeavors, and to congratulate each other in attaining a financial goal. As a consequence, participation in a ROSCA has been compared with membership in a Weight Watchers program, where group pressure and support make progress possible (Light, 1996, p. 2). Light also describes ROSCAs as "educational institutions" because they support information sharing. It is not uncommon for participants to discuss what they intend to do with their pot and for other participants to offer information on where to best purchase a particular good or service (Light, 1996, p. 2). In this way, ROSCAs offer some, and perhaps many, of the services that financial advisors in banking institutions provide.

Group pressure. Finally, organizers and group members rely on social capital to ensure continuous monthly payments throughout the life of the ROSCA, even after a member has had his turn at the pot. Normally, participants meet their contributions for fear of the social consequences. Sometimes, however, members need coercing. Often, the organizer or another group member may visit the home of the defaulting member and make clear that he must pay his obligation (Bonnett, 1981, p. 64). When that fails, the organizer may "proceed to announce to all and sundry in the vicinity what the defaulting member had done" (Bonnett, 1981, p. 64). In a tightly knit community or in a community based on cultural ties rather than geography, as in immigrant communities across the U.S., social disapproval could mean the end to access to credit.

Other Economic Benefits

While ROSCAs require the social infrastructure of a community in order to function, they are essentially formed to meet certain economic needs, the primary being access to credit, which was discussed at length in previous sections. ROSCA participants also derive other economic benefits, which are attested to by the fact that ROSCAs continue to operate in developing countries and in immigrant groups in developed countries. One benefit of participating in the consumer durable ROSCA, which perhaps pertains to ROSCA participants in the developing world, is that it allows participants to attain the purchasing power necessary to negotiate for goods at a lower price. Having access to goods at a lower price allows households to save or to purchase more of other goods, in addition to any benefit the household may derive from owning the good.

Other benefits include increased utility, lower transaction costs, and accessibility and flexibility, which will be discussed in more detail below.

Increased utility. Economic analysis in the academic literature finds increased utility accruing to ROSCA participants when they do not have access to formal financial markets. That is, ROSCA participants could not otherwise place their money in savings vehicles in mainstream financial institutions. The authors Besley, Coate, and Loury (1993) used lifetime utility possibility models to examine the overall utility of ROSCAs and concluded that both random and bidding ROSCAs yield higher utility than under autarky, which is a state of self-sufficiency.[13] To illustrate: A country that does not engage in trade because it produces all the goods its citizens require operates under autarky. Countries engage in trade, however, because they stand to gain from it. ROSCA participants, the authors show, receive goods sooner as a result of their ROSCA membership than if they were to save individually.

Refer to the random ROSCA example in Table 1. If ROSCA participants were to use their own personal saving schedule to purchase a $500 good, each participant would receive the good in the fifth month, assuming that participants saved $100 per month. By participating in a ROSCA, however, Table 1 shows that each participant, except P5, receives the good before the fifth month, as represented by the shaded cells. Thus, ROSCAs benefit participants by allowing them to receive goods earlier than if they were to save individually. (Note, however, that when the time value of money is taken into account, a random ROSCA participant's level of utility decreases, the later in the rotation cycle he receives the pot.)

The last individual in the ROSCA derives no apparent economic benefit from his participation. Since it would take as much time to receive the good by participating in the ROSCA as it would if he saved by himself, one would think that the last participant would opt out of participating, causing a chain reaction of nonparticipation among members (Besley, Coate, and Loury, 1993, pp. 795-797). However, the authors recognize the importance of social capital in a ROSCA. Therefore, while the last participant may not gain any economic benefit from his membership in a ROSCA, he receives social benefits. His membership in this particular ROSCA is a step toward building his social capital, so that perhaps in the future, he may be credible enough to organize his own ROSCA.

Lower transaction costs. Because ROSCAs are formed by assembling participants of a closely knit community who are aware of each other's creditworthiness, costs associated with bank lending – such as running a credit check, assessing credit risk, requiring collateral, and performing pre-loan and post-loan monitoring – are not explicitly incurred. The anecdotal literature also suggests that ROSCAs enjoy small incidences of default – a result of effective group pressure (Chami and Fischer, 1995, p. 362). These lower transaction costs are thus passed along to ROSCA members, which may result in lower cost loans or higher yielding savings plans (Chami and Fischer, 1995, p. 362).

Accessibility and flexibility. Fewer transactions costs also enable ROSCA members to receive loans quickly. While borrowers with little or no credit history (as may be the case for immigrants) may experience some difficulty or delay in accessing funds from financial institutions, a ROSCA organizer may have his funds in as little as a day. Quick disbursal of funds may be instrumental to closing a deal or responding to an emer-

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[13] In a companion article, Besley, Coate, and Loury (1994) find that ROSCAs are generally dominated by formal financial markets when they are available to ROSCA participants.

gency (Shanmugam, 1989, pp. 360-361). Additionally, many meetings are routinely held at a member's home and at night, making it convenient for working members, who may not have access to bank services either because of location or because of limited branch hours (Bouman and Harteveld, 1976, pp. 115-116). Furthermore, ROSCA meetings are social gatherings, where members share a common language and culture. For individuals unfamiliar with financial institutions and the banking concepts associated with them, being able to access funds generated by the community can prove to be less intimidating.

ROSCAs also exhibit a certain degree of flexibility. Characteristics such as loan amount, duration, regularity of meetings, and rotational assignment depend on members' requirements. ROSCAs, which are formed to meet a community's financial demands, could thus be organized according to the specific needs of the community.

Finally, participants cite ROSCAs as a good source of obtaining small loans, which banks are normally reluctant to extend to someone with little credit history. Some pool sizes can be as small as $100, requiring members to contribute as little as $10 a month. Others, however, can aggregate funds of $40,000 or more.

Although ROSCA membership may be economically beneficial, the majority of Americans are unaware of its benefits. There is evidence that early forms of U.S. savings and loan associations exhibited similar characteristics, but they have evolved into the current banking system of today in order to serve large numbers of people. ROSCAs, however, are still used in the United States among minority groups, imported by immigrants from their country of origin.

Use in the United States and Among Different Minority Groups

In the U.S., ROSCAs are used for many different reasons, including consumer purchases, large-scale life events such as weddings and funerals, and small-business capital formation. In fact, the success of Asian and West Indian small-business owners may be attributable to the existence of ROSCAs, which can serve as a source of start-up capital. According to Light (1972, pp. 25-26), the Chinese ROSCA (hui) is used especially for small-business capitalization and has evolved in the U.S. more for commercial purposes than for social reasons.

Surveys suggest that the Japanese ROSCA (tanomoshi), Korean ROSCA (kye) in Los Angeles, and West Indian ROSCA (susu) in New York are still used in certain circles for business enterprises and for social reasons (Light, 1972, p. 30). Although no firm numbers exist to document the number of ROSCAs in the U.S. or the number of total participants, informal estimates abound. In 1983, the *Korea Times* estimated that there were "at least 1,000" kyes in Los Angeles (Light and Bonacich, 1988, p. 252). Two participants in a survey conducted by Edward Chang in 1983 estimated that 80 percent of their circle of family and friends participated in kyes (Light and Bonacich, 1988, p. 248). In a survey conducted in 1965-66, slightly less than 50 percent of foreign-born Japanese in California indicated participation in a tanomoshi (Light and Bonacich, 1988, p. 28).

Members' reluctance to discuss their participation poses a barrier to conducting an accurate survey. Members, most of whom are immigrants and some of whom are illegal immigrants, worry about the legality of

their form of economic cooperation. As Chang discovered, respondents who knew and trusted him were more willing to provide detailed answers (Light and Bonacich, 1988, p. 249).

In almost every minority group, anecdotal evidence exists to suggest the use of ROSCAs for business purposes or for consumer purchases. In each instance, the general paradigm of pooling and disbursing funds among participants can be found. However, studies in the anthropological literature fail to uncover much evidence of ROSCA use by African-Americans. Light (1972, p. 36) refers to this lack of reference as "negative evidence" of its use. Historians are unable to say conclusively whether this practice existed at all among African-Americans or whether it was lost as a result of their unique experience in the United States. Many studies, however, point to the use of ROSCAs by West Indians to support the view that ROSCAs were a part of the African-American culture but that the practice subsequently fell into disuse. Since African-Americans and West Indian Africans originated from West Africa, the use of ROSCAs by West Indian Africans is important (Light, 1972, p. 37). Light hypothesizes that West Indian Africans were able to maintain their culture of systematically rotating their funds because of the system of landlord absenteeism that characterized life in the islands. Left to their own economic initiative, Africans in the West Indies relied on their traditional financial sources, which included ROSCAs. African-Americans, on the other hand, lived in close proximity to the members of the majority population, whose lifestyle and economic practices they could more easily imitate (Light, 1972, pp. 37-44).

As a result, the use of ROSCAs has not been documented as emanating from the African-American community, although in his survey of West Indian Africans in New York, Bonnett uncovered several African-American participants. According to Bonnett, these African-American participants subsequently became organizers of their own ROSCAs (Bonnett, 1981, p. 59). Bonnett's finding, however, does not necessarily negate Light's hypothesis: The African-American participants in Bonnett's study were originally members of ROSCAs organized primarily by West Indian Africans.

Policy Implications and Observations

The literature abounds with anecdotal evidence describing benefits that accrue to ROSCA participants. Like financial institutions in the formal sector, ROSCAs provide participants with the savings and credit mechanisms necessary to smooth their consumption cycles. ROSCA participants can access larger sums of money than they currently have at their disposal with the convenience of a monthly repayment schedule, or they can participate in a ROSCA in anticipation of future cash-flow constraints. While it may be difficult to assess the precise economic impact of ROSCAs on their participants or in the informal sector, 2001 data released by the Small Business Administration may hint at ROSCAs' real economic impact.

A further look into minority business ownership shows that Asians, who make up 3.6 percent of the U.S. population according to the 2000 census, own 4.4 percent of U.S. small businesses — a disproportionately larger share than any other minority group. Interestingly, Asians are also widely cited in the literature as using ROSCAs for business capital formation. In contrast, African-Americans and Hispanics, who make up 12.3 percent and 12.5 percent of the population, respectively, own 4.0 percent and 5.8 percent of U.S. small businesses. A survey conducted in 1993-94 and 1997-98 in the Little Village and Chatham sections in Chicago by the Federal Reserve Bank of Chicago and the University of Chicago found that "firms owned by Hispanics and

Blacks start with lower amounts of start-up funds on average than [whites, Asians, and others]" (Huck, Rhine, Townsend, and Bond, 1999, p. 475). If barriers to capital exist equably across minority groups, the disproportionately larger share of Asians may suggest, but does not substantiate, that ROSCAs play large and vital roles in offering an alternative avenue to capital.

If ROSCAs offer viable financial alternatives to banking institutions, what is the possibility of replicating the ROSCA model in groups unfamiliar with them? The difficulty of such a proposition lies in the complex social nature of ROSCAs, which require a closely knit community and high levels of social cohesion – both of which may be easier for those in developing countries or for immigrant groups to satisfy. Through technology and progress, American society has become geographically mobile, even in low- and moderate-income communities; it is not uncommon for families to move from one neighborhood to another and, as a result, move from one community to another. The result is a loosening of social ties and, to a lesser degree, of community identification. Decreased community affiliation has a direct effect on participants' sense of obligation toward each other, and it decreases the effectiveness of peer pressure that the organizer or group exerts on an individual. Furthermore, if participants place less emphasis on social stature or altruism, the incentive for the last participant (P5 in Table 1) to join the ROSCA would diminish, if not disappear altogether. Finally, geographic mobility allows an unethical participant to physically leave one neighborhood after he has received his turn at the pot and to establish himself at another location and begin anew.

Attempting to replicate the ROSCA model in communities not equipped with the prerequisite social or cultural attributes could result in some parties' not making regular payments, possibly resulting in participants' losing their investment, a burden that low- and moderate-income individuals are least able to assume. Such an experience could have the unintended consequence of leaving participants disillusioned not only with their neighbors and the community but with the financial sector in general. These potential pitfalls surrounding the introduction of ROSCAs to new communities must be balanced against the possible benefits that might accrue to the participants. Additionally, the size of a pool generated in low- and moderate-income communities will likely be small, at least initially, and would have to expand over time to better support business capital formation.

Several proposals in the literature attempt to facilitate the expansion of ROSCAs to low- and moderate-income communities. Light (1996, p. 3), for example, suggests that ROSCAs be introduced to groups that already have achieved high levels of social cohesion, such as church groups and social clubs. While it may be true that these groups enjoy higher levels of social cohesion than traditional American communities, the degree of social cohesion may not reach the levels required for ROSCA formation unless the groups have ties similar to those found in immigrant groups. ROSCA members are connected not only by social ties, but they also most likely share the same culture, language, and, more important, the same experiences. For immigrant groups in the U.S., arriving in a country where the language and customs are alien can be a defining experience. Immigrant groups are thus more willing to assist a new arrival in starting a business because of their shared experiences.

Light (1996, p. 3) also suggests formalizing or legalizing ROSCAs in order to make them viable in new communities and more efficient in general. While these steps could be helpful in protecting the assets of ROSCA members and would bring ROSCAs under the U.S. legal system, the additional paperwork and

oversight may adversely affect the dynamic of the ROSCA. Any additional costs that come with implementing additional documentation would increase the cost of capital. How important this effect actually is, however, is unclear, since we have little information in the U.S. on the actual cost of capital to ROSCA participants.

Data Needs

Although ROSCAs are important financial vehicles in the developing world and continue to be used by immigrant groups in the developed world, including the United States, we have accumulated little hard data about them within the U.S. Because ROSCAs can provide borrowers without access to mainstream financial institutions a means to acquire financial capital, it would be helpful to know whether ROSCA participants face substantially different costs than if they were to obtain such financial capital from mainstream financial institutions. The data collected here from one local ROSCA offer a unique glimpse into how one immigrant group currently obtains financial capital and at what cost. The particular example, however, is constrained by time and location: It shows only how one particular community of one ethnic group is obtaining capital today.

It would be interesting to explore how other immigrant communities across the U.S. obtain access to financial capital via ROSCAs and the precise manner in which they run their ROSCAs. Additionally, collection of ROSCA data could also show how participants respond to economic cycles. Would monthly bids (and hence the associated interest costs) change more or less dramatically than those of formal institutions? One could also explore the use of ROSCAs among second-generation immigrants in the U.S. Are there any cultural differences or varying degrees of assimilation among second-generation immigrants who use ROSCAs and those who do not? Could the decreased use of ROSCAs among second-generation immigrants as compared with first-generation immigrants result from the availability of access to mainstream capital or an inability to capitalize the ROSCA's loan pool? Could it simply be that the lack of social cohesion poses a barrier? Finally, additional data gathered on ROSCAs would show the incidences of default. Are defaults as low as the anecdotal literature suggests? Do default rates vary across time and across immigrant groups?

The actual bidding ROSCA described here will conclude its activities in early 2007. With a full data set, researchers will be able to explore the financial experiences of participants who received the pot in the early rounds, as well as those who received the pot in the later rounds. More data, however, are needed, and one of the purposes of this project is to obtain additional sets of complete figures from actual ROSCAs. The lesson that Edward Chang learned during his 1983 survey of Korean ROSCAs should be considered: Those whose confidence he gained were more likely to describe their experiences (Light and Bonacich, 1988, p. 249). People with ties to immigrant communities are particularly situated to collect the relevant data. Many organizations, in particular, the Federal Reserve Bank of Philadelphia, would be interested in creating a data warehouse to store primary ROSCA data.

Call For Data

Those interested in assisting with this project's data collection effort will find that the largest hurdle to overcome is gaining the confidence of ROSCA members. The dearth of ROSCA data lies in the fact that ROSCA members tightly guard the details of their transactions. Data collectors must make clear to ROSCA members that this project is interested only in documenting ROSCAs for research purposes and that no infor-

mation would be collected that could identify ROSCA participants. Once a participant's confidence has been gained, the data collection process is straightforward.

At the bare minimum, information such as the number of participants (and number of rotations or periods), the frequency of rotations (weekly, monthly, quarterly), and the periodic contribution amount should be collected. For bidding ROSCAs, the bid amounts of each rotation would be necessary so that the financial experience of ROSCA participants can be compared with what is available from alternative lenders. The following worksheet (see the Figure) provides an example of the type of data a collector would need to record. The collector may need to alter the worksheet to reflect the number of participants for each ROSCA. The worksheet could also be adapted to record additional information, provided participants are willing to share it. However, asking too many questions could significantly reduce ROSCA members' willingness to provide the basic information listed on the worksheet. For instance, although researchers would probably want to learn about the uses of funds, the bid amounts for each round (not just the highest one), the profession and income of the participant, the length of time the participant has resided in the host country, and demographic variables such as race or ethnicity, age, and gender, attempting to obtain such information might be counterproductive if it deters people from revealing the basic ROSCA data noted earlier.

The Federal Reserve Bank of Philadelphia is interested in creating a data warehouse for primary data on ROSCAs.[14] Primary ROSCA data would then be made available to those interested in learning more about ROSCAs. Questions related to ROSCAs in general, data collection, or data submission should be directed to: christy.hevener@phil.frb.org.

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[14] The Federal Reserve System encompasses 12 Reserve Banks across the country, and we are seeking their cooperation to support this data collection effort.

FIGURE

ROSCA – Data Collection Worksheet/Example of a 10-Person ROSCA

Contribution each period: ROSCA name:*

Frequency of rotation:* ROSCA type:*

Number of participants: ROSCA start date:

ROSCA Participant	Bid Amount
P1	
P2	
P3	
P4	
P5	
P6	
P7	
P8	
P9	
P10	

RECORD OF MONTHLY CONTRIBUTIONS (in dollars)

	t_1	t_2	t_3	t_4	t_5	t_6	t_7	t_8	t_9	t_{10}
P1										
P2										
P3										
P4										
P5										
P6										
P7										
P8										
P9										
P10										

Observations:

* **ROSCA name** refers to the name used by ROSCA participants (e.g., hui, kye, susu, chit, etc.); **ROSCA type** refers to the type of ROSCA (random, consumer durable, or bidding); **frequency of rotation** refers to the frequency of the meetings (weekly, monthly, quarterly, yearly, etc.). Any additional observations can be included in the space provided.

APPENDIX*

Country/Region	ROSCA name
Borneo	Kongsi
Cambodia	Tontine
Cameroon	Djanggi
China	Hui
Congo	Kitimo; Ikilemba
Egypt	Gameya
India	Kameti; Chit fund
Jamaica	Partners
Korea	Kye
Malaya	Tonti
Mexico	Tanda
Nigeria	Oha; Osusu; Adashi
Scotland and Northern England	Menages
Sierra Leone	Asusu
South Africa	Chita; Chitu; Mahodisana; Stokfel
Sudan	Sanduk; Khatta
Trinidad	Susu
Vietnam	Ho
Central and East Africa	Chilemba
West Africa	Esusu

* This is not an exhaustive list of the ROSCAs in use in the world. The information was obtained mostly from Shirley Ardener's "The Comparative Study of Rotating Credit Associations" (Ardener, 1964).

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