SHARING THE RISK OF BEING POOR: COMMUNAL SAVING GAMES IN BANGKOK

by

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When the commercial or governmental forms of credit are inaccessible, poor people are found to establish credit mechanisms among themselves. Throughout the developing world, people share the risk of lending money to each other by forming small credit societies where periodic savings of all members go to one of the members on a rotating basis. There are many variations of such communal arrangements, and in different countries they are known by different names: '*bisi*' in Pakistan, '*cheetus*' in Sri Lanka, '*hwei*' and '*kuttu*' in Malaysia and Singapore, '*ho*' in Viet Nam, '*arisan*' in Indonesia, '*paluwagan*' in the Philippines, '*kye*' in Korea, and '*consorcio*' in Brazil. While the rules, practices and purposes of savings may vary, there is always a similarity in the communal nature of the arrangements, in the regularity of payments, and in the rotation of recipients.

To our knowledge, these arrangements have not been the subject of intensive study. Our interest in studying the social and economic organization of poor urban communities, particularly with respect to mutual aid in housing finance, has led us into a detailed investigation of this phenomenon. It is a good example of the type of organization that flourishes in low-income communities. It demonstrates, contrary to commonly held views, that poor people are capable of organizing mutually beneficial joint efforts. It shows that poor people are capable of generating significant savings and are capable of meeting regular payments.

Van der Harst (1974), in his study of low-income housing in Pakistan, identified the '*bisi* committee' as a pecuniary organization popular among low-income groups. He found that about one out of three respondents used this financing method for investing in a house. A *bisi* committee was described as consisting of members who are related to each other—coming from the same up-country village, being a member of the same '*biraderi*', living in the same neighbourhood, or contributing to the same union. A good relationship among *bisi* members is needed because mutual trust is essential.

The *bisi* committee proceeds as follows: a fixed number of members agree to meet at regular intervals. To each meeting every member brings a fixed amount of money, one share.

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During the meeting the individual shares of all members are paid to one of the members. The amount of money paid to that member is referred to as the 'pot'. Each member obtains the pot once for the duration of the committee. The number of meetings therefore equals the number of members in the committee.

The decision on who gets the pot at a particular meeting varies from one committee to another. In some committees, the drawing of lots determines the lucky member. In others, the one who needs the money most urgently at that particular time receives the pot. Harst also found that 90 per cent of the members of various committees took care that the monthly share did not amount to more than 25 per cent of household income. About one out of every two *bisi* members was reluctant to pay more than 10 per cent of his household income.

In Thailand, several studies refer briefly to communal saving practices. Morrell and Morrell (1972), in their study of six slums in Bangkok, found that while 62 per cent of the families interviewed in four slums had no savings of any kind, 28 per cent belonged to mutual savings groups.

Rozenthal (1970) also discussed '*len chaer*' in Thailand, but referred to it as '*bia huey*' (rotating credit society). He treated it mainly as a source of funds for business investment. Rozenthal described the society as a mechanism by which persons obtain funds on an intermittent basis from other persons similarly situated. Members make periodic contributions to revolving funds and at regular intervals, and disbursements are made from this fund to one of the participants. He found that the Thai *bia huey* differs from other similar arrangements in Asia, seeming to be an exclusively urban phenomenon, and providing a significant amount of funds for ongoing business operations, rather than just *ad hoc* funds for consumption needs. Rozenthal described the mechanism of the game and estimated that modal interest rates for the games played by businessmen range from 3 to 5 per cent per month.

Parvez (1975), in his study of the people's housing resources in Bangkok, described the *len chaer* and estimated that it was practised by an estimated 51 per cent of the people in his study of four low-income communities. He also estimated the total annual transactions in *chaer* ('share') games in Bangkok's low-income settlements to be on the order of 108 million baht (US$ 5.4 million; currently $1 = 20 baht). The procedure of the game is similar to the *bisi* committee in Pakistan except that a member has to bid in order to get the pot. The highest bidder gets the pot, and the amount he bids is a form of interest he has to distribute to other members at that particular meeting. Parvez was of the opinion that the *chaer* game has great potential to be exploited for the development of housing capital.

Chen (1976) discovered a similar system in Taiwan called '*hwei*' (loan club), and a somewhat distinct variation of the system in the rural areas. The procedure of both of these practices is the same as in *chaer* in Thailand, except that in the rural areas rice is used instead of money as the medium of exchange among farmers. '*Che'ga'hwei*' (rice club) is more popular than the *hwei* and meetings are held twice a year to coincide with the harvest season. Most of the rice clubs have 14 members, and last for seven years. The amount of rice each shareholder pays is approximately 600 kilogrammes.

Similar rotating credit societies are mentioned by Kerkal (1967) in his study of the so-called unorganized money markets in India. The 'chit fund' in India functions with rules similar to those mentioned above, and is prevalent in villages and towns. Topley (1964) also touches on traditional credit associations among farmers in Hong Kong's New Territories. Few as these works are, they provide a useful background for this more detailed study.

In this study, we focus our attention on the workings of *len chaer*, the 'share game', which is the popular type of communal saving arrangement practised widely in Bangkok. In the following section, we explain the rules of the different types of share games, and discuss the findings of a field study in the Din Daeng squatter community in Bangkok, which reveal the extent and characteristics of participation in the games. In section III we present the social organization of share games, with particular emphasis on the mechanisms for establishing and sustaining trust among participants. In section IV we discuss the economic aspects of the games—the accumulation, extent and use of savings. Finally, in section V, given the records of 23 games collected in Bangkok, we analyse the financial aspects of the games, and the advantages or disadvantages of participation in the games compared with available alternative uses of savings.

An improved understanding of communal saving practices in low-income communities may shed some light on the feasibility and possibility of the use of savings in self-help community development in slum and squatter improvement projects. In many recent attempts at slum and squatter improvements, the financial participation of the people has been estimated independently of the institutional arrangements which exist for the people to save. This study examines one type of arrangement whereby people have saved a considerable amount of funds. New arrangements, incorporating a better understanding of existing practices, may have a better chance of success than a strict application of established commercial or governmental credit schemes. One such new arrangement is described in the conclusion of this paper.

Games

The rules of the share game are fairly complex, and systematic effort is needed to establish, organize and complete it. The games often continue for periods of several months to over a year. Cooperation and enthusiasm must therefore be maintained over a relatively extended period of time.

The purpose of the game is to mobilize funds in time of need, without having to resort to a moneylender. The game is generally initiated by a leader, who invites a number of trustworthy acquaintances or relatives to contribute to the pool a fixed amount, a share, every payment period (which may vary from daily to monthly). The number of payment periods is equal to the total number of shares and may exceed the number of participants, since some may opt for more than one share. The price per share varies widely—from one baht ($0.05) for some daily share games to 500,000 baht ($25,000) for games played by affluent businessmen

on a monthly basis. Although the persons participating in a game are generally friends or relatives, total strangers guaranteed by the leader may also become members.

In order to win the periodic pot, a member must bid. Those who need the money at any given payment period will bid, and the highest bidder will get the pot. Bidding is done by secret ballot. The level of bidding varies widely from game to game. The intensity of bidding is related to the implied interest rates for borrowers and lenders in the game. But since almost everyone is both a borrower and a lender, these are not immediately apparent. The game is thus a game in the real sense of the word, incorporating the exciting aspects of gambling and uncertainty, while in practice providing financial security for participants.

Rules

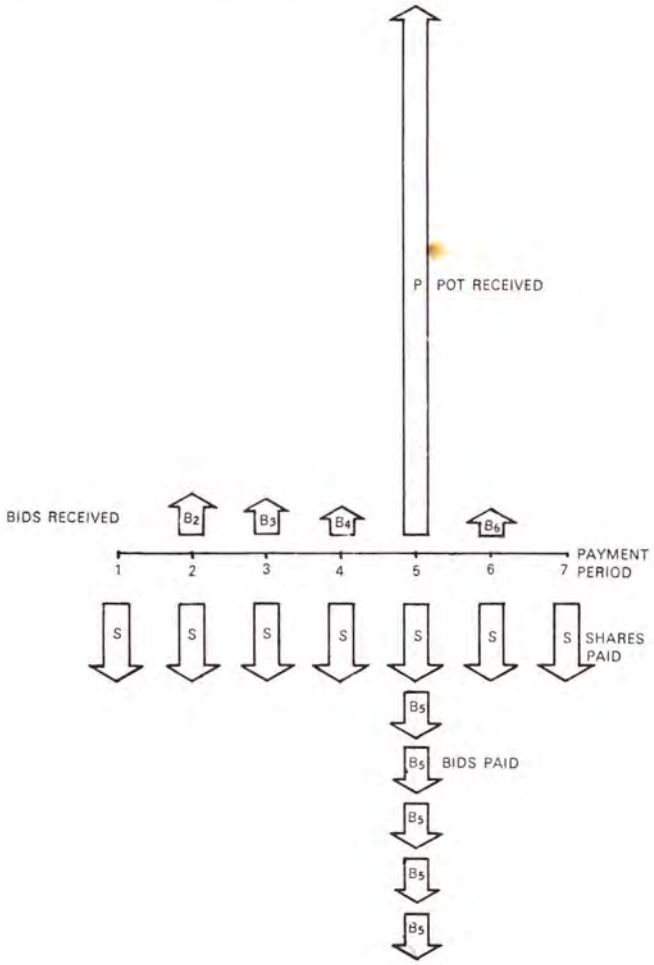
Our survey revealed three major types of share games played in low-income communities, all of which require considerable discipline from participants. The first type of game is called '*chaer dɔk klap*', which is popular among middle and upper-income people. The value of a share may vary from 500 baht ($25) to 100,000 baht ($5,000) or more among the richer groups. The price, payment day, payment period (usually monthly), number of shares for each member, total number of shares and rules are discussed and agreed upon during the first meeting when all members are present. At the first meeting the pot goes to the leader as a loan to himself free of interest.

In the second payment period (one month later), a second meeting is held. If there are seven persons having a 1,000-baht share each, the total pot will be 7,000 baht. Those who need money will have to bid for it by writing their name and bid on a sheet of paper which is placed in a bowl. The leader opens the bids and reads them to other members. If A is the highest bidder at 150 baht, he then has to pay each of the other six members 150 baht. The net amount that participant A will receive is 5,100 baht [7,000 - (6 × 150), minus A's 1,000-baht share]. All these transactions are managed by the leader, since he receives all the contributions. When there is no formal leader, this is handled by the highest bidder himself. In this period, therefore, each of the six other members contributes 850 baht towards A's loan.

In the third payment period, the leader and member A can no longer participate in the bidding since they have already received their pots. Suppose B makes the highest bid, say 130 baht. The net amount B receives is 5,220 baht [7,000 - (6 × 130), minus B's 1,000-baht share]. Thus each of the other six members contributes 870 baht towards B's loan. This procedure goes on until the last period, in this case the seventh, and in each period the number of members eligible to bid decreases. If there are few bidders and nobody wants to make a bid, the winner may be chosen by lottery decided on by agreement among the remaining members entitled to bid. The last player naturally gets the pot without bidding.

It is important to note that the unique features of *chaer dɔk klap* are : firstly, the immediate deduction of the bid payment from the share, and secondly, the privilege of receiving bid payments after a member has received his pot. Payments and receipts in this game are illustrated in figure 1.

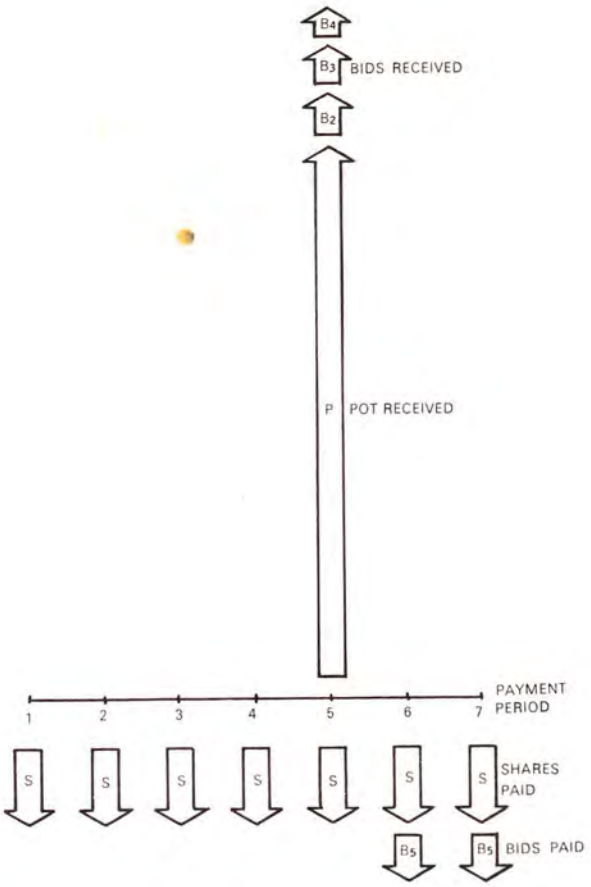
Figure 1. Payments and receipts in '*chaer dɔk klap*' by the winning bidder in the fifth period, in a game with seven members.



The second type of game, '*chaer dɔk tam*', is popular among lower, middle and upper-income people. In a game with seven participants, each having a 100-baht share, the pot is 700 baht. The procedure for the first payment period is exactly the same as in *chaer dɔk klap*—all the money collected goes to the leader. In this case, the net amount received by the leader is 600 baht.

In the second payment period, suppose A happens to be the highest bidder at 16 baht. The net amount A receives is equivalent to the pot minus his share or 600 baht. But from then on, starting from the third to the last payment period, A has to pay the winning bidders in addition to his share an amount equal to his bid, or a total of 116 baht.

Figure 2. Payments and receipts in '*chaer dɔk tam*' by the winning bidder in the fifth period, in a game with seven players.



Thus, in the third payment period, the net amount received by the winning bidder grows to 616 baht because of A's additional payment of 16 baht. Again, the leader and A are not eligible to bid, since they have already received their pots. Suppose B bids highest at 14 baht. B then gets a pot of 616 baht. From the fourth period to the last payment period, B has to pay 114 baht.

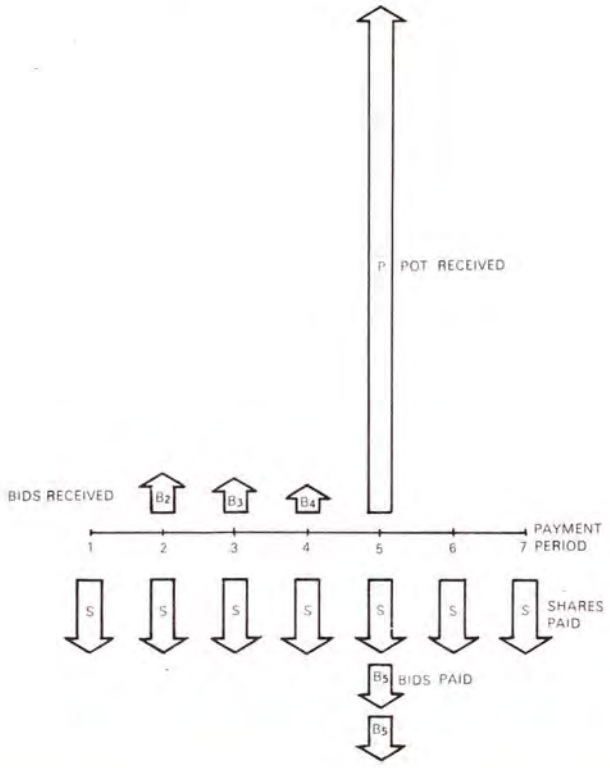
The main features of this type of game are, firstly, that bid payments from other members are received only at the time the bid is won. Bid payments are not deducted from the shares, and have to be paid by each winner in the succeeding periods. The pooled amount thus grows each payment period by an amount equal to the accumulated bid payments of previous winners. Payment and receipts in this game are illustrated in figure 2.

The third type of game, '*chaer dɔk hak*', is more popular among the lower-income groups, and is the major type practised in the Din Daeng study area. The name of this particular type of game indicates the major feature of this game. '*Hak*' means deduct: the game works on the principle of deducting the bids at the time payment is made. To match needs and income patterns of lower-income people, the amount of money per share is lower (5 to 300 baht), and there is a greater variation in the duration of payment periods: daily, 5-day, 7-day, 10-day, 15-day, and monthly.

Suppose we have seven members each having a 100-baht share. The procedure for the first payment period is the same as in the two previous games: the leader receives a net amount of 600 baht (i.e. the total amount of the shares contributed by the other six members).

In the second payment period, suppose A makes the highest bid of 45 baht. A makes bid payments of 45 baht each to the five members who have not yet received their pot. The pot A receives is 375 baht [700 - (5 x 45), minus A's 100-baht share]. A pays back in the succeeding periods 100 baht for every 55 baht lent to him. In this period, A receives 55 baht from each of the five members, plus 100 baht from the leader.

Figure 3. Payments and receipts in '*chaer dɔk hak*' by the winning bidder in the fifth period, in a game with seven participants.



As with the two previous types, those who receive their pots are no longer eligible to bid in the next payment period. The main difference here is that they are not entitled to receive bid payments in the succeeding payment periods.

In the third meeting, suppose B makes the highest bid of 40 baht. The pot he receives is 440 baht [700 - (4 x 40), minus B's 100-baht share]. Thus B receives 60 baht from each of four members plus 100 baht from A and 100 baht from the leader. This procedure goes on until the end of the game. In each period, the number of members receiving interest equals the number of payment periods left.

The main features of this game are, therefore, the immediate deduction of bid payments from the pot and the cancellation of the privilege to receive interest after a member has received his pot. Payments and receipts in this game are illustrated in figure 3.

Participation

A survey was conducted in the urban squatter community of Din Daeng in Bangkok. A total of 82 households, or approximately 10 per cent of those living in the survey area were interviewed. The sample was evenly distributed throughout the community. Of the 82 respondents interviewed, 38 or 46.4 per cent of the sample was participating in share games at the time.

The 38 respondents surveyed who practised *chaer* reported having played a total of 111 games (including those in progress) in the last two years, an average of approximately three games per respondent. While about two thirds of the games were held in the survey area, the rest were held in nearby flats, in work places or in other places outside the area. The larger percentage of games held in the community indicates its primacy as the focal point of social relations. Members living together for a long time are better able to assess each other's trustworthiness.

Participants in share games come from all income levels within the community. Some are comparatively well off, and others are sometimes poor and sometimes not so poor. The wide distribution of income in the community is the major factor which makes the share game possible and successful. Those with surplus income may be in a position to provide financing to those in need. Those in need could repay their loan by instalments.

The diversity of incomes in the community is illustrated by the average monthly household income of respondents shown in table 1.

It can be clearly seen from the table that monthly incomes are relatively evenly distributed from the lowest to the highest bracket, and that there is no significant difference between participants and non-participants. The median household income for participants was 1,599 baht per month, while that for non-participants was 1,549 baht.

There seems to be no significant correlation between composition of members in a game and kinship ties of a member, except in very few cases. In fact, on average the number of members known by name rarely exceeds 30 per cent of the total. The major factors which bind

Table 1. Monthly household income distributions (in percentages) of participants and non-participants in share games in the Din Daeng community

MONTHLY INCOME *Baht*	PARTICIPANTS	NON-PARTICIPANTS	TOTAL
500-800	–	9.09	4.88
801-1000	13.16	13.64	13.41
1001-1200	10.53	9.09	9.76
1201-1400	10.53	11.36	10.98
1401-1600	15.79	9.09	12.19
1601-1800	7.89	4.54	6.10
1801-2000	7.89	4.54	6.10
2001-2500	10.53	15.92	13.41
2500 +	23.68	22.73	23.17
Total	*100.00*	*100.00*	*100.00*

Note: In 1976, US.$1.00 = 20 baht.

these people together in a cooperative relationship are proximity in living and working situations and the presence of a leader whom they can trust.

We can thus see that when the need is there, poor people form effective organizations to meet the need. These organizations are necessarily loose and temporary. They do not lend themselves easily to static perceptions of order. What may appear as disorganization may be our own inability to perceive a dynamic order. By investigating the organization of share games we observe that informal contacts within the community allow for the development of mutual trust, which in turn allows financial organizations, largely based on trust, to flourish. The establishment and maintenance of trust is the subject of the following section.

Trust

It is very difficult for low-income people to obtain loans or credit from banks or other formal financial institutions which share the conservative conviction that the poor cannot meet regular payments. There is also a related belief that, since poor communities do not have proper mechanisms of social control, written laws and regulations are needed to maintain order. Contrary to this view, we have found that poor people are extremely conscientious about meeting the payment obligations of share games. Social control is maintained, and fear of ostracism prevents members from cheating.

Leadership

When a game is formed, members are generally recruited at the invitation of a leader. It was found that a majority of the respondents (60.5 per cent) reported having been invited by the leader, and 18.4 per cent by other members. Only 13.2 per cent presented themselves to a group when they heard of its formation.

These findings suggest the importance of a leader's network of social relationships which is mobilized when he organizes a game. Membership then is generally limited to a leader's circle of friends. Trustworthiness of potential participants is established over long years of mutual acquaintance and frequent social interaction — 73.7 per cent of the participants had spent at least four years in the community. The minimum number of years that a respondent had known a leader was two, while the majority had known the leader for an average of five years.

The primary consideration for evaluating a leader's qualities is the people's subjective perception of his personality. A positive perception is based on the credibility of the leader— that he will not abscond with the money, and that he will honour his guarantee against default by a new member, unknown to the others. Of the sample 81.6 per cent felt that the most important qualities of a leader are that he is trustworthy, honest and responsible. The importance of credibility is not, however, limited to the leader. The trust works both ways; a corresponding evaluation of prospective members is made by the leader. Therefore, the relationship between a leader and a member must be close enough to evaluate each other's trustworthiness.

Some of the leaders reported that there are times when more people want to participate than the leader intends to accept. This is unavoidable, because news of a game being organized spreads very fast in the neighbourhood. The leader, however, manages to keep the membership within the desired size by setting up criteria for admission. To weed out 'high-risk' persons, selectivity is exercised based on closeness of prospective members to the leader, and the person's income or ability to pay. (The latter is normally based on the nature of one's employment.)

Reliability

Most of the participants pay their contributions directly to the leader at his house, on regular payment days. Some contributions are not paid on time, usually due to a temporary shortage of cash, unexpectedly low earnings, or late payment of salary. Payment may then be postponed, generally not longer than two days, with the knowledge and approval of the leader.

One leader, when asked how she would respond if a member did not pay his contribution on time, said that her policy would be to tolerate a maximum of three unfaithful members for only two successive periods. Beyond that, she would dissolve the game. There are of course instances where members who fail to pay are excused. This happens when one loses his job or dies unexpectedly. In such circumstances, his share is cancelled without further obligations on either side.

Members were also asked what action they would take if a game were to fail because of another member. More than half responded that they would ask the leader to do something, which would be effective only if the leader were willing to shoulder the obligation of unfaithful members. A quarter of the respondents would do nothing and would leave the person alone. Not a single respondent mentioned that he would confront the member personally. This does not mean, however, that social control is lacking, because there are more subtle ways in which sanctions to erring members can be effected.

Since the people playing the game have similar backgrounds and incomes, cheating becomes an affront to the community at large, and would involve considerable loss of face in the neighbourhood as well as the loss of the leader's friendship and trust. The cheating member would essentially be ostracized and would probably have to leave the area. This situation was verified in one case of a leader whom the members reported had left the area because he did not pay the pot due to a member, and consequently the game failed.

These controls account for the relatively low rate of failure of games. Of the 111 games reported by respondents, eight games were unsuccessful and were not completed, a failure rate of 7.2 per cent. The failure rate is thus low enough for people to risk their precious savings regularly to participate in the game.

Legality

This low rate of failure of games persists although the law provides no protection to participants against default. The legality of the game is also questionable. Of the 38 respondents who played *chaer*, 19 thought the game legal, 10 considered it illegal, and the rest had no opinion. Almost 66 per cent of the respondents thought participation in the share game is not gambling. Prevailing social attitudes seem to regard the negative aspects of gambling and infringement of civil laws as less important than the more relevent factor of savings.

The question of possible legalization of share games was posed to the participants to determine whether the support of the law would be a welcome feature. Twenty of the participants answered in the affirmative, while 18 answered in the negative. This could mean that in reality members do not see any necessity to recognize 'share' as a legal institution. Some cynical comments reflected the people's lack of faith in the efficacy of the law; they felt that the law would be of no help to them if the game were to fail. Some felt that legalizing *chaer* would be too troublesome, which may reflect an attitude which is engendered by an awareness of the slow and frustrating pace of government bureaucracies. Other comments, however, were more positive. One respondent felt that if *chaer* were legalized, cheating would be minimized.

From the findings on participants' attitudes towards *chaer*, it seems that they are generally satisfied with the present arrangements, practices and rules. Share games are well established and widely accepted, and have endured over time without outside interference and institutional connections.

Legalization is a complicated issue and should not be considered apart from the social structure of the game. If ever there is a move to legalize *chaer*, it must be made with extreme

care. Legalization would necessitate instituting formal rules which might be unacceptable to participants and result in the slow death of the game. Formalities, such as requirements that share games be registered and that members write a promissory note, would no doubt help to reduce the incidence of malpractice, but would transform the nature of the game. Since the game depends on mutual trust, such formalities could be interpreted as alienating and damaging to social relations. Among close relations for example, such requirements would be considered as a personal affront since they would be tantamount to questioning the member's credibility and good name. Legalization, policing and prosecution may also entail major costs, which can hardly be afforded by the people. Mutual trust is free, but its replacement may be expensive.

Savings

Extent

In Din Daeng, the majority of members (81.6 per cent) participate in the game because it is a 'good way to save and get money any time'. Because of the structural arrangements of the game, once people participate, they are then obligated to save money that would otherwise be spent on other things. As such, the share game can be viewed as a mechanism to help people control their spending.

It was found that 71 per cent of those who play the game contributed from 1,000 to 6,000 baht a year to the game, while a total of 76.3 per cent contributed over 3,000 baht. Nearly two thirds of the respondents had share contributions amounting to 30 per cent of their over-all monthly expenditures. Monthly share contributions increase with income. The average monthly contribution for share participants was found to be 618 baht. If the median monthly income is 1,600 baht, this estimate would mean a monthly share contribution representing a savings of 36.6 per cent of income. If a conservative estimate of 25 per cent of the estimated 150,000 households in the squatter and temporary tenure communities in Bangkok[1] play *chaer*, with an average of 4,800 baht per household saved per year, the total would be in excess of 180 million baht ($9 million), a significant amount of money circulating within low-income communities. This amount is roughly equivalent to 2 per cent of private residents' savings deposits in commercial banks in Thailand by the end of 1975[2].

Uses

The uses of the '*ngun chaer*' or 'pot' were found to be diverse and varied; however, almost 73 per cent of the participants in Din Daeng used the pot to buy household appliances (see

[1] Angel, Benjamin and de Goede (1976), p. 3.
[2] Bank of Thailand (1976), p. 42.

table 2 below). A notable feature of the findings is that priorities for use of the pot were similar for games with long and short payments intervals. Also, the priorities seem to be independent of the participants' income levels, as similar rankings were observed for all levels.

Table 2. Uses of '*ngun chaer*' (pot) received in share games in the Din Daeng squatter community

USES	SHARE PAYMENT INTERVALS						
	Daily share	7-day	10-day	15-day	Monthly	Total	Per cent*
Household appliances	1	4	3	13	6	27	72.9
Spending little-by-little	1	3	1	8	2	15	40.5
Buying food in bulk	-	3	1	6	3	13	35.1
Needs of children (e.g. education)	1	1	1	5	-	8	21.6
Business, investment	-	1	-	3	1	5	13.5
Paying debts	1	-	-	2	1	4	10.8
Bank deposits	-	-	-	3	1	4	10.8
Emergency needs (e.g. illness)	-	-	-	3	1	4	10.8
House repairs	-	-	-	1	1	2	5.4
Religious contributions	-	-	-	-	1	1	2.7

Note: *Percentage based on 27 respondents

It may be presumed that the pattern of spending priorities, which emphasizes household appliances, reflects the living situation of the people. Since most of them have no security of tenure, home improvements rank low. Money is then diverted to buying durable consumption goods and food in bulk which improve living conditions within the community. The fourth preferred use of the pot was for the education of children, which might more appropriately be labelled as a social and, ultimately, an economic investment.

As for household appliances, all respondents were asked about their possession of various items costing more than 100 baht, and the manner in which they were acquired. The results were tabulated by income level, and were divided between participants and non-participants. The three most commonly possessed items, owned by more than 50 per cent of respondents in both groups, were radios, cabinets and mattresses.

However, it is interesting to note that although there were no significant differences in income levels between the two groups, there were proportionately more items owned by participants than non-participants. This is also clear from the average number of possessions per family, where a marked difference is observed: 5.55 for participants *vs.* 2.63 items for non-participants. It is noteworthy that over 50 per cent of the participants possessed an electric iron, a fan and a television set in addition to the above-mentioned three items. Most of the

household possesions in the list could be purchased in cash with the pot received from an average 15-day game.

These comparisons may indicate that the participants in share games are able to modernize and adapt themselves to an urban lifestyle more easily than others. Furthermore, possessing these items may be regarded as indicative of their standard of living, and their relative status in the community. Knowing that they will have a fairly large amount of money available during a given time period allows them to plan expenditures.

The frequency of borrowing money from others was also studied: 32.6 per cent of the non-participants had borrowed money often, while only 23.7 per cent of the participants had done so. More participants (34.2 per cent) indicated that their income exceeded their expenditures than nonparticipants (13.6 per cent). Consequently, fewer participants (26.3 per cent) were found to be overspending than non-participants (31.8 per cent). Participants in share games appear to have a higher propensity to save, a factor which may increase their social and economic mobility.

Interest

The reader has surmised by now that bid payments paid to participants in the share game are a form of interest payments. Players who bid for the money at an earlier date pay other players who bid at a later date. Thus at the end of the game, early bidders end up with less money than what they contribute, and late bidders end up with more money than they contribute. Transactions among players can be seen as payments for capital services, or interest payments. The rates of interest in any particular game are different for every participant, since they depend on the level of his winning bid. They are difficult to calculate or predict since they also depend on all the other bids. Moreover, the concept of interest cannot be applied readily because most participants are borrowers and lenders at the same time.

The objective of this section is to determine the rates of interest in share games, and to relate them to known parameters in the game. For this purpose we have collected complete records of transactions in 23 games and analysed the financial aspects of these games using a computer programme[3]. The rationale for studying the rates of interest in share games is to determine whether the share game is as good or better a form of savings or investment than the alternatives available to the participants. The main alternatives considered here are commercial banks, and money lending or borrowing in the 'unorganized' money market.

It was necessary first to determine the financial structure of the game. The value of a transaction in the game depends on the time at which it takes place. Money paid or received earlier in the game is worth more than money paid or received later. For financial analysis it is necessary to know exactly how much more.

The rate at which future transactions are discounted to find their present value is identical to that at which present transactions gain in value with time. Hence, the discount rate and the

[3] Of the 23 games only two were collected in the Din Daeng area during the survey. The rest were collected in other communities and workplaces, and are included here for purposes of comparison.

interest rate can be considered the same. If the interest rate on a 100-baht loan is 20 per cent per month, 100 baht lent today will be worth 120 baht in one month's time (100 × 1.2).

This interest rate is equal to the discount rate. The present value of 120 baht a month from now is, therefore, 100 baht (120 ÷ 1.2). Similarly, 144 baht two months from now is worth 100 baht now (144 ÷ 1.2 ÷ 1.2). Postulating an unknown discount rate for each participant thus enables us to treat all his transactions as if they took place at the beginning of the game. The sum of all his discounted transactions is, then, their present value. (For a precise treatment of this subject, see the annex to this article.) The 'breakeven' interest rate for each individual is that discount rate at which the present value of the sum of all his transactions is equal to zero. This rate is unknown and must be calculated from our knowledge of all the other parameters in a given game: its type, the number of participants, the time period between bids, and the winning bid in each time period.

From the empirical analysis of the records it is possible to identify two main types of participants, borrowers and lenders, and one intermediate type which consists of borrower-lenders. Borrowers typically receive their money (the pot) in the early part of the game while lenders wait until the latter periods.

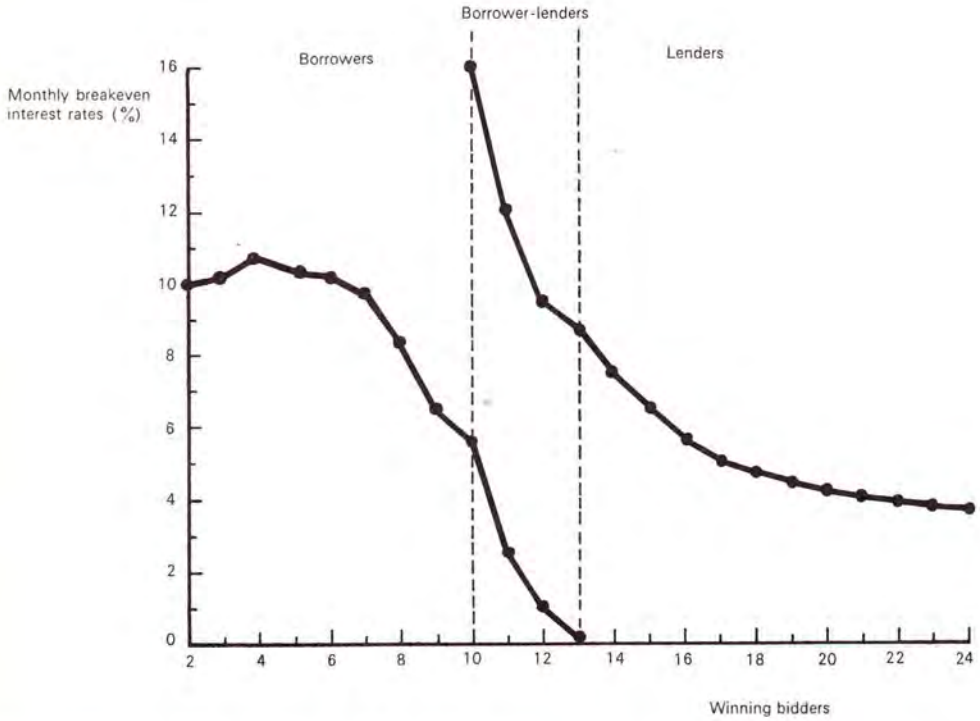
Borrowers and lenders are defined by the behaviour of their breakeven interest rates. The breakeven interest rate for the borrower is the **minimum** interest rate necessary for him to gain from playing the game. If he can borrow from an alternative source at a lower interest rate, it is not worthwhile for him to play the game. Alternatively, if he invests the pot, the return from his investment must be higher than his breakeven interest rate. If he consumes the money from the pot now, his preference for consumption now rather than later must be worth at least the interest paid for the pot. If he pays a 20 per cent monthly interest on a 1,000-baht pot, consuming it now implies that 1,000 baht now is worth more to him than 1,200 baht a month from now.

The breakeven interest rate for the lender is the **maximum** interest rate necessary for him to gain from playing the game. If he can lend money somewhere else at a higher rate than his breakeven interest rate, it is not worthwhile for him to participate in the game. Alternatively, if he borrows money to participate in the game, the interest rate on his loan should be lower than his breakeven rate for him to gain by playing the game. If he waits one month to receive a monthly interest rate of 10 per cent on a 1,000-baht pot, his waiting implies that 1,100 baht a month later is worth more to him than consuming 1,000 baht now. For the borrower-lender, a unique breakeven point cannot be determined, because he has both a breakeven borrowing rate and a breakeven lending rate. Breakeven minimum and maximum rates are shown graphically in figure 4.

In the 23 games studies, borrowers consistently form approximately 30 per cent of the players, and lenders approximately 50 per cent. The rest are borrower-lenders[4]. There are thus more lenders than borrowers in a typical game. A larger number of people lend money to a smaller number of people and share the proceeds. Gains from lending are

[4] More precisely, borrowers average 30 per cent of players with a standard deviation of 3 per cent, while lenders average 50 per cent with a standard deviation of 7 per cent.

Figure 4. A typical model of a share game: points represent 'breakeven' interest rates for participants.



Note: Participants 2-9 are borrowers, 10-13 are borrower-lenders, and 14-24 are lenders.

thus on average smaller than losses on borrowing. These fixed proportions also tell us something about the participants, in terms of predicting their roles in future games. If a participant takes the pot among the first 30 per cent of the players, he is likely to be a borrower. Conversely, if he takes it among the last 50 per cent, he is likely to be a lender.

In the games studied, two key variables appear to affect breakeven interest rates — the bids, and the time period between each transaction. The relationship between the bids and the breakeven interest rates is complex, and can be determined precisely only through mathematical computations. The reason is that this relationship is not a one-to-one relationship, but a many-to-many relationship. All bids determine all the breakeven interest rates in a game. Still, it appears possible to detect two related empirical regularities in the games, as follows.

(a) Average breakeven borrowing rates and average breakeven lending rates appear to be related to the time period between payments: generally, the shorter the time period, the higher the rates. This can be observed in table 3 below.

Table 3. Average monthly breakeven interest rates as a function of the payment period for the 23 games recorded

Time period *Days*	No. of games recorded	Average monthly breakeven rate (%) borrowing	lending
1	1	46.50	45.20
7	1	36.70	20.70
10	2	9.35	8.35
15	5	8.74	8.72
30	14	3.94	3.29

Although the number of games recorded in the shorter period categories was small, there appears to be a direct relationship between the time period between suceessive bids and the breakeven interest rates for borrowers and lenders in the game. Computed monthly rates decline rapidly as the time period increases. It appears that this relationship exists because the average bids as proportions of shares do not vary widely, while the interest in the shorter period game is accumulated more often. This can be understood more clearly by introducing the concept of the 'intensity of bidding'.

The intensity of bidding[5] measures the average amount of bids paid in one month as a proportion of the value of one share. More specifically:

Intensity of bidding = (average bid) × (no. of payment periods per month) ÷ (value of one share)

Simply stated, the higher the bids relative to the value of the share, the higher the intensity. An average bid of 40 baht on a monthly share of 100 baht will have double the intensity of an average bid of 20 baht on a monthly share of 100 baht. Similarly, an average bid of 80 baht on a monthly share of 200 baht will have the same intensity as an average bid of 40 baht on a monthly share of 100 baht. Intensity, however, also incorporates the effect of the frequency of bidding. An average bid of 40 baht on a monthly share of 100 baht will have the same intensity as a bi-weekly bid of 20 baht on a 100-baht share, or a weekly average bid of 10 baht on a 100-baht share. When we compare the breakeven interest rates for borrowers and lenders in the 23 games recorded, we find a direct linear relationship between the two. This empirical regularity can be stated as follows.

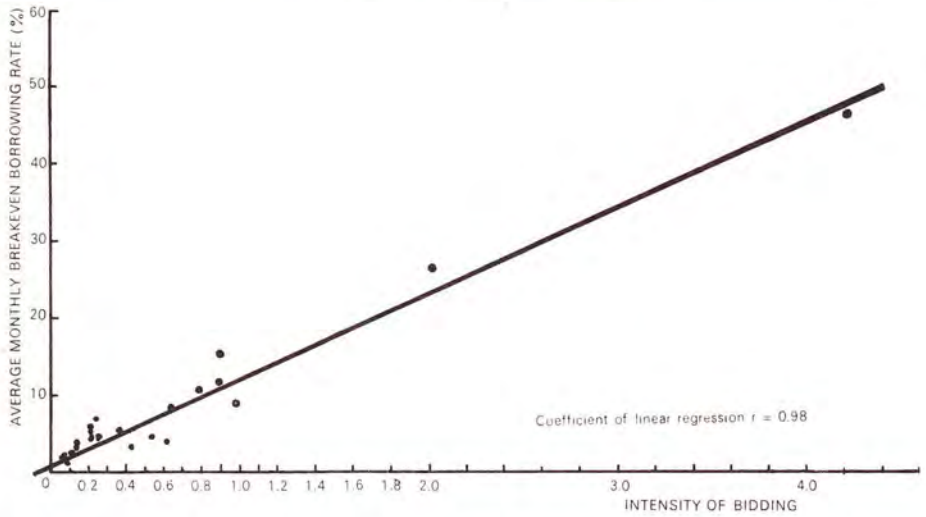
Coefficient of linear regression r = 0.98

(b) Average breakeven interest rates are linearly related to the intensity of bidding in the game. Generally, the higher the intensity, the higher the rates.

The relationship between the intensity and bidding and average breakeven borrowing rate is illustrated graphically in figure 5. A similar relationship holds true for lenders.

[5] A mathematical definition of the 'intensity of bidding' appears in the annex.

Figure 5. The observed linear relationship between the intensity of bidding and the average breakeven borrowing rate



As can be observed in figure 5, the breakeven rate is roughly 10 times the intensity of bidding. Unfortunately, the data are insufficient to formulate this parameter as a rule of thumb. With more data it may be possible to formulate such a rule, and thus be able to calculate roughly the breakeven rates in a game without resort to the computer. For example[6], if the average bid in a game were 20 baht, the value of a share 100 baht, and the bid period 15 days, the intensity of bidding would be $20\ (30 \div 15) \div 100 = 0.4$, and the monthly breakeven interest rate would be approximately 4 per cent (0.4×10).

Given our understanding of breakeven interest rates, we are now in a position to compare the financial advantage or disadvantage of participating in a share game against borrowing money from a commercial bank or a moneylender; or saving money in a commercial bank rather than participating in games as a lender.

We conducted a small survey of moneylender borrowing rates in Din Daeng. Sixteen respondents borrowed money ranging from 100 to 2,000 baht for an approximate period of 20 days. The average borrowing rate in this sample was 32 per cent per month. Table 4 below

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6 The exact linear regression equation for borrowers is

$$i_B = 11.1\ I + 1.1, \text{ with } r = 0.98$$

and for lenders

$$i_L = 10.2\ I + 1.1, \text{ with } r = 0.98$$

for the 23 recorded games. With this more precise formula, if the average bid in the game were 20 baht, the value of the share 100 baht, and the bid period 15 days, the intensity of bidding would be 0.4 as calculated above, and the expected breakeven borrowing rates would be

$$i_B = 11.1 \times 0.4 + 1.1 = 5.54\% \text{ per month for borrowers}$$

and $$i_L = 10.2 \times 0.4 + 1.1 = 5.18\% \text{ per month for lenders.}$$

reproduces table 3, with the addition of computations for annual interest rates for purposes of comparison.

Commercial banks do not usually allow low-income people to borrow. Their borrowing rates, however, are in the range of 15 per cent per year. Interest paid on deposits is approximately 6 per cent per year.

Table 4. Average monthly and annual breakeven interest rates for the 23 games recorded

Time period *Days*	No. of games recorded	Average monthly breakeven rates (%)		Average annual breakeven rates (%)	
		borrowers	lenders	borrowers	lenders
1	1	46.50	45.20	9,674	8,682
7	1	26.70	20.70	1,611	856
10	2	9.35	8.35	192	162
15	5	38.74	8.72	173	173
30	14	.94	3.29	59	47

As can be seen immediately from the table, lending breakeven rates are higher than commercial bank rates in all games. It is therefore financially more profitable to participate in a share game as a lender than to save money in the bank or invest it in a venture which yields a lower rate of return than the breakeven lending rate. Judging from the rates in table 4, few such ventures are available to low-income people!

Conversely, borrowers would benefit from being able to borrow from financial institutions if such loans were available. Unfortunately, in most cases they are not. Borrowing arrangements do exist at workplaces and among relatives, usually at low interest rates. These may be preferable to participation in a share game as a borrower, but may require favours or social obligations that carry a social cost. Finally, borrowers can borrow from moneylenders at the existing rates.

Given the current average borrowing rate from moneylenders, 32 per cent per month, we can observe from table 4 that borrowers in the one-day game would on average do **better** if they borrowed money from moneylenders. They are paying a higher monthly interest rate in the game to break even. Borrowers in all the other games observed would on average do better by playing the game than by borrowing from moneylenders. On the other hand, lenders in the one-day game receive higher interest rates than moneylenders. Moneylenders would thus benefit from playing similar one-day share games than lending money to individuals (at a higher risk).

Hence, we must conclude that when the intensity of bidding is very high, borrowers pay exorbitant interest rates to participate in games and would do better by seeking loans from other sources. This conclusion is necessarily limited, however, to financial considerations, and cannot account for the social costs and benefits of participation or non-participation.

Conclusion

Communal saving games do provide a socially acceptable and readily available source of funds in low-income communities. The incentive to save is strengthened by the participation of friends and neighbours in the game, by the recreational aspects of the game, and by the equality of the participants in the game. Although we have identified borrowers and lenders in a given game, roles may readily change from one game to the other, depending on the timing of urgent needs of particular participants. Even within a game, it is difficult to predict who will be a borrower and who will be a lender until people bid. However, future research may reveal that some participants are always lenders and some are always borrowers. There may indeed be a relationship between the relative incomes of participants and their roles as borrowers or lenders—lower-income people participating usually as borrowers and higher-income people participating as lenders. Our data cannot shed light on this issue at this time.

Even in case we may find that share games do transfer incomes from the poorer section to the richer section in the community and are therefore regressive, we must still remember that the funds remain in the community. The variations in income within the community are not so large, and in terms of the society as a whole transfers may not be as regressive as loans from commercial banks. The rotating credit society must be viewed as one alternative form of saving, with the social arrangements and the risks associated with it. For many, it may be the only acceptable form of saving.

Community development programmes that aim at increasing the financial capability of the poor may benefit by exploring this form of saving as a means of financing home improvements. An organization called Freedom to Build, Inc., was recently formed in the large squatter resettlement community of Dasmarinas on the outskirts of Manila. Freedom to Build sells building materials at lower than market prices to encourage housing improvements. Recently, the first group of nine families was organized into a *paluwagan*. Every two weeks they meet to pool their savings. There is no bidding and the order of recipients of the pot is decided in advance. The recipient family purchases building materials from the store, and on Sundays all the families come together to help build it. Similar arrangements are quite common in Pakistan as noted earlier, and can be expanded to other countries.

We must also look at the results of the study when we attempt to improve the credit arrangements in poor communities. The parameters of the share game provide us with a measure of what is available now. We can explore new arrangements which may compete with the moneylender and with the share game, may be more beneficial to the people, and may increase the availability of credit for productive investments within the community. The share game is by no means ideal, but until a better arrangement is developed, it appears to perform a useful and reliable role in the economic life of poor communities.

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ANNEX

A mathematical note

The procedure for calculating 'breakeven' interest rates for share game participants is described below. We are given the sequence of winning bids, B_j, where $j = 2, n$, in a share game with n participants and consequently n bid periods. We are also given the value of one share, S, and the length of the bid period, T, measured in days.

(a) '*Chaer dɔk tam*'.

Consider the stream of payments and receipts for a participant k. It consists of four components.

(i) n shares of value S, which he pays

(ii) a pot P_k which he receives in period k when he makes the highest bid, where $P_k = n \cdot S$

(iii) his bid payments B_k which he pays once every payment period to the winning bidders until the completion of the game

(iv) bids of other participants who won the pot before him, $B_2, B_3, \ldots . B_{k-1}$, which are paid to him when he wins his pot in period k

We find his breakeven interest rate, i_k, by calculating the sum of the present values of the four components and equating it to zero[1]. The present value of the first component, V_1^k, is

$$(1) \quad V_1^k = S + \frac{S}{(1+i_k)} + \frac{S}{(1+i_k)^2} + \ldots\ldots \frac{S}{(1+i_k)^{n-1}}$$

$$= \frac{S}{i_k}\left[\frac{(1+i_k)^n - 1}{(1+i_k)^{n-1}}\right]$$

The present value of the second component, V_2^k, is

$$(2) \quad V_2^k = \frac{P_k}{(1+i_k)^{k-1}} = \frac{n \cdot S}{(1+i_k)^{k-1}}$$

The present value of the third component, V_3^k, is

$$(3) \quad V_3^k = \frac{B_k}{(1+i_k)^k} + \frac{B_k}{(1+i_k)^{k+1}} + \ldots\ldots \frac{B_k}{(1+i_k)^{n-1}}$$

The present value of the fourth component, V_4^k, is

$$(4) \quad V_4^k = \frac{B_2 + B_3 + \ldots B_{k-1}}{(1+i_k)^{k-1}} = \frac{\sum_{j=2}^{k-1} B_j}{(1+i_k)^{k-1}}$$

To find i_k, we must solve

$$(5) \quad V^k = V_1^k - V_2^k + V_3^k - V_4^k = 0$$

This equation is a polynomial equation in $(1 + i_k)$ and has a large number of roots. We find the appropriate value for i_k by substituting different i_k in equation (5), and searching for zero values for V^k. We repeat the procedure for all other participants. With the aid of the computer, we can approximate a present value surface, where

$V^k = V(i, k)$, given n, S, T, and B_j, $j = 2, n$.

The intersection of this surface with the XY plane provides us with the breakeven interest values for all participants. Where the surface intersects the XY plane at two points, for a given participant, we can identify which point is his breakeven borrowing rate, and which point is his breakeven lending rate.

(b) '*Chaer dɔk hak*'.

The procedure here is similar to the procedure for *chaer dɔk tam*, with slight variations in the equations for the third and fourth components of present value. The participant's winning bid B_k is paid to every participant who has not yet won a pot at the time participant k

[1] i_k is the interest rate for one time period between bids, T. It can later be converted to a monthly rate i_k', or an annual rate i_k'', by $i_k' = (1 + i_k)^{30/T} - 1$, or $i_k'' = (1 + i_k)^{360/T} - 1$ respectively.

receives the pot. Bid payments of all participants who won the pot before him, B_2, B_3, ... B_{k-1}, are paid to participant k when they win their pot. We thus have

$$V_3^k = \frac{B_k \cdot (n-k)}{(1+i_k)^{k-1}} \quad \text{and}$$

$$V_4^k = \frac{B_2}{(1+i_k)} + \frac{B_3}{(1+i_k)^2} + \ldots\ldots \frac{B_{k-1}}{(1+i_k)^{k-2}}$$

$$= \sum_{j=2}^{k-1} \frac{B_j}{(1+i_k)^{j-1}}$$

The calculation for '*chaer dɔk klap*' proceeds in a similar manner and need not be repeated here.

(c) *The 'intensity of bidding'.*

We define the intensity of bidding in a game, I, as the ratio of the average bid payments per month and the value of a share. Using our previous notation we can write the following equation.

$$I = \bar{B} \cdot \left(\frac{30}{T}\right) \cdot \frac{1}{S}$$

$$= \left(\frac{1}{S}\right) \left(\frac{30}{T}\right) \left(\frac{1}{n-2}\right) \sum_{j=2}^{n-1} B_j$$