Explaining Participation in Rotating Savings and Credit Associations (RoSCAs): Evidence from Indonesia[§]

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Abstract:
This paper empirically tests the common rationales for participation in RoSCAs in Indonesia. The anthropological literature suggests that credit constrained and poor individuals, as well as women, are more likely to participate in the RoSCA. However, using data from Indonesia, I find that the relation between participation and income is quadratic. Moreover, I find that those who are credit constrained are less likely to participate in the RoSCA. Additionally, I confirm that women are more likely to participate in RoSCAs. Moreover, I find that the reasons for participating in several RoSCAs are similar to participating in just one RoSCA. This serves as a robustness check of the earlier results.

Keywords: Informal finance, RoSCAs, Indonesia

I. Introduction

RoSCAs (Rotating Savings and Credit Associations) are informal, indigenous savings and credit institutions, which are prevalent in both developing and developed economies around the world. A typical RoSCA works in the following manner. A group of individuals meet together on a regular basis (say once a month or once a week) and contribute some fixed amount of money, decided either mutually or by the leader of the RoSCA, into a `*pot'* every time they meet. At the end of each meeting, one member of the group is selected to receive the pot[1]. This can be done either randomly (hence the name - random RoSCA) or by bidding (which results in a bidding RoSCA). This process continues till every member of the group receives the pot of money once. Obviously, those members who have already received the pot earlier cannot receive the pot again, though they still have to contribute to the pot. When every member of the group has received the pot of money once, the group is disbanded, or can be started again with different members, different contributions and a possibly different duration between subsequent meetings.

The seminal contributions to the study of RoSCAs were anthropological, comparative studies by Geertz (1962) and Ardener[2] (1964) who document the workings of RoSCAs around the world. RoSCAs are thought to be important to households primarily because they are a form of informal finance which has important implications for welfare through its role in savings. At the same time, they are also interesting institutions to analyze because they are a

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[1] This can either be done randomly (hence the name, the random RoSCA) or by bidding (i.e. the bidding RoSCA). While these are the most common types of RoSCAs which are mentioned in the literature, rotation of the pot can also be due to seniority, or just mutual assent by the members.

[2] Ardener (1964) is a comprehensive survey of RoSCAs around the world, and addresses the various types of ways in which they work. This literature established that RoSCAs are a worldwide phenomenon, although they are especially widespread in Asia and Africa.

social construct, determined entirely by the social relations of the group members. Despite this, the RoSCA, as an institution, has received limited attention from economists.

Theoretical models to explain the prevalence of RoSCAs were developed in Economics by Besley, Coate and Loury (1992, 1993). They showed that participating in a RoSCA was not efficient compared to autarky (saving on their own) and that the random RoSCA[3] may yield a higher level of ex ante expected utility to participants than the formal financial market. Despite this, individuals tend to participate in RoSCAs because they mobilize savings that would lie idle under autarkic savings and thus take advantage of gains from intertemporal trade (Besley et al. 1992). A crucial assumption of the Besley et al (1992) model is that individuals are credit constrained. At the outset, they state that their objective is to explain how "a group of individuals without access to credit markets could improve their welfare by forming a RoSCA" (Besley et al. 1992, pg 1). Several of the hypotheses that Besley et al (1993) conjectured have been tested in a series of follow-up papers.

However, thus far, the choice to participate in RoSCAs has not been systematically analyzed, even though such an analysis is important to understanding how RoSCAs work. Until now, researchers started with the assumption that individuals participate in a RoSCA and subsequently addressed various questions (such as efficiency, or effects) regarding RoSCAs. Hence, understanding why individuals participate in RoSCAs and why they participate in more than one RoSCA are themselves important questions. This would also help

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[3] A random RoSCA is one where the pot is randomly assigned to members of the group. The other type of RoSCA that is quite commonly found is the bidding RoSCA, where members of the group bid for the right to receive the pot at an earlier date.

us understand several of the fundamental assumptions of the anthropological and theoretical literature on RoSCAs.

The first such assumption is the general belief (at least from the anthropological literature) that RoSCAs are informal finance mechanisms that are predominantly used by the poor. Ardener (pg. 2, 1995) believes that "where incomes are very low, where there is no formal social security network, where ill health stalks and a variety of calamities hover, a system of low-cost RoSCAs helps to meet the challenges for all …" Kurtz[4] (1973) sees poverty as a positive "correlate" of RoSCA participation. Calomiris and Rajaraman (1998) claim that evidence on participation by the poor is very widespread.

Related to this is the assumption that people who generally participate in RoSCAs are credit constrained. While this was assumed in the theoretical work of Besley et al (1992), Handa and Kirton (1999) allude to this in their paper. In trying to explain why wealthier individuals are members of RoSCAs, they claim that they "... observe individuals who are unlikely to be credit constrained in the formal capital market." (Handa and Kirton 1999, pg. 180). Moreover, the lack of collateral is often given as a reason for why people should choose an informal finance mechanism (such as the RoSCA) over a formal financial institution.

The third and final assumption that is often made and has been supported by empirical work on RoSCAs is that women are more likely to participate in RoSCAs than men.

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[4] Kurtz (1973, pg. 51) also says, "*that a state of poverty is a significant theme underlying almost all rotating credit association.*"

Levenson and Besley (1996b) and Handa and Kirton (1999) offer empirical evidence that RoSCAs may not necessarily be meant for the poor. They show that RoSCA participation increases with income[5], i.e., richer individuals are more likely to participate in RoSCAs. However, income and RoSCA participation can be simultaneously determined. Levenson and Besley (1996b) allude to this problem of endogeneity but do not address this specifically due to the lack of good instruments. Handa and Kirton (1999) treat income as exogenous to participation.

Moreover, this upward relationship between expenditure and RoSCA participation can itself be an indication that RoSCAs participants may not be credit constrained. Yet, this assumption, that individuals who participate in RoSCAs are credit constrained, has not yet been specifically tested.

A second deficiency of the existing literature is the lack of analysis using nationally representative samples. The cross sectional empirical papers so far, have been based on small, relatively poor samples collected from a limited geographical area. Handa and Kirton (1999) use a sample of 1000 individuals, from four parishes in Jamaica. They compare this to a sample from the census and find that the RoSCA participation sample is poorer. Anderson and Baland (2002) base their analysis on a sample of 520 households, from a poor slum in Kenya[6]. However, there may exist selection issues in using a geographically limited sample,

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[5] Levenson and Besley (1996b) use a vector of dummy variables for the household's position in the income distribution in the survey year, while Handa and Kirton (1999) use reported monthly income of the individual.
[6] Anderson and Baland (2002, pg 17) in their description of the data state that "*The inhabitants are very poor. They live with enormous risks to their health and income, with no access to formal insurance or credit institutions.*"

as any conclusions about the efficacy and efficiency of RoSCAs are likely to be a function of who is participating in them.

In light of the above literature, this paper looks at two questions. First, who participates in the RoSCA? Second, why do individuals participate in more than one RoSCA? This is done by looking at how participation in the RoSCA, varies across individual, household and community characteristics. While I try to understand participation in RoSCAs, I am also interested in two more objectives.

First, I seek to empirically test the assumptions that RoSCA participants are credit constrained, and to a lesser extent, that participants are poor. Second, I analyze RoSCA participation using a nationally representative sample, from Indonesia.

The paper is organized as follows. Section II describes RoSCAs in Indonesia (how they work, their characteristics, and distinguishes between various types of RoSCAs in Indonesia) as well as the data used for the econometric analysis. Section III outlines the econometric methodology that is used in the paper. Section IV presents and discusses the results from a sample that is restricted to individuals who are credit constrained. I conclude with Section V.

II. Data on RoSCA participation

The RoSCA in Indonesia is called the *arisan* – which literally means *cooperative endeavor* or *mutual help* (Geertz 1962). The *arisan* is in general a random[7] RoSCA where interest is predominantly not calculated. Sometimes, rotation may also be determined by mutual agreement. Most of the *arisans* in Indonesia are ongoing – they do not end with just one rotation, but continue with more or less the same set of individuals. This section describes the data used to analyze RoSCA participation in Indonesia

The Indonesia Family Life Survey (IFLS)

The data that I use for analyzing participation in the *arisan* are taken primarily from the second round of the Indonesian Family Life Survey (IFLS), which was conducted in 1997. The IFLS is an ongoing panel survey of households and communities conducted jointly by RAND and the Demographic Institute at the University of Indonesia. The survey sampled 321 villages in 13 of Indonesia's 27 provinces, interviewed about 30,000 individuals from 7,500 households and is representative of 83% of the national population of roughly two hundred million.

The key variable of interest comes from the *Arisan* participation section in the third module of the survey, which was asked to all household members above the age of 15 years. Participants of *arisans* were asked which type of *arisan* they participated in during the last

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[7] Hospes (1992a) finds no *arisan that used bids to determine the order of rotation.* Geertz (1962) also observes this.

twelve months, the frequency of meeting, amount contributed, and the period between the times that the participant received the pot.

Several types of *arisans* exist in Indonesia. There is the office *arisan*, which can be established in one to two ways. First, they can be set up by people working in the same office[8]. Office *arisans* can also be set up under the auspices of government bodies or official welfare programs such as the Family Welfare Program which is primarily directed at women[9].

The neighborhood and sub-neighborhood *arisans*, though they are self-explanatory, deserve mention because of their popularity. They are the most common types of *arisan*s – where literally all the adult members in the community can participate.

Arisans can also be set up by groupings of ethnicity and religion. Ethnic groups living outside their place of origin often form an *arisan* as the basis of regular meetings[10]. Religious *arisans* are generally ones in which members of a religious community come together to first sing and pray verses, and then conduct an *arisan* meeting. The family *arisan* is formed by family members and relatives, sometimes even extending into the fourth generation.

The final type of *arisan* that should be mentioned is the market *arisan* – which is an *arisan* organized by traders in the market place. Market *arisans*, are *arisans* in which there are

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[8] For example, school teachers or waitresses form *arisans* amongst themselves.
[9] Government officials used the economic and social potential of the *arisan* to popularize women's activities and to educate the population (Williams and Johnston 1983.)
[10] Hospes (1992) documents evidence of this through his case study of Teluhu, a Moluccan town.

no meetings that are actually held. Rather an agent is selected to tour the stalls of traders to collect the contributions and at the end of the agreed rotation, assigns the *pot* to one trader. Here, the drawing of the fund tends to be fixed. However, since the fund tends to be ongoing, after several rotations, the sense of getting the fund early in the rotation vs. later becomes obscured as each trader receives a particular amount at fixed intervals[11].

Arisans can form in several ways. One way is when perhaps three or four people informally decide to start an *arisan*, and subsequently invite others to join them. Inviting others lowers the probability that someone in the *arisan* may default on his contribution. Another common way, in which an *arisan* can form, is via an already existing group[12]. Such a natural collection of people encourages the *arisan* to form. However, the key thing is that members are already well known to each other.

Characteristics of the Arisans

The resulting sample from the IFLS consists of 19811 individuals out of whom 5841 participate in at least one *arisan*. This gives a participation rate of about 29%. In addition 75% of the participants participate in only one *arisan*, while the rest participate in more than one. Thus, a significant proportion of the sample participates in two or more *arisans*. There are even eight individuals who participate in at least six *arisans*. Individuals may possibly join

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[11] Gugerty (2000) notes that when participants know the order of allocation before the RoSCA has begun there is no uncertainty to resolve. If the last person to receive the *pot* knows she is last she is not likely to join the RoSCA since she could save up the same amount of money in the same period of time. Thus, by backward induction, no one is likely to join the RoSCA. Thus, the RoSCA unravels as each subsequent individual loses her motivation for participation. Yet, in the case of the market *arisan,* this is not the case.

[12] For example, a group of individuals may participate in a community development activity (such as a health post) and subsequently form an *arisan.*

multiple *arisans* in order to hedge between *arisans* depending on duration and contribution rates. Calomiris and Rajaraman (1998) make note of this possibility in conjunction with the insurance role of RoSCAs[13]. For example, they may join family *arisans* – since they may feel less guilty about defaulting on a payment in a family *arisan* than in an office *arisan*, where their pride is at stake. Finally, it is entirely possible that they do not join the *arisan* solely for financial reasons but for the social capital it gives them. Individuals gain different types of social capital (e.g. information, social contacts) from different *arisans* since social capital is a function of the people involved in the group. The most popular types of *arisan* in the data were the sub-neighborhood *arisans*, along with *Other* types.

Contribution to the *arisan*, as a function of monthly per capita expenditure is not trivial. On average, individuals contribute about 11% of household monthly per capita expenditure. Both the *arisans* that had exclusively female membership (e.g. Wives of Civil Servants and Women's Associations) have one of the lowest contribution rates as a function of expenditure. This can be due to the fact that women may not have much income of their own – either because they might depend on their husband's income if they are not working or because they may not have much left at their disposal after spending for the household.

Religious *arisans* also have a relatively low contribution rate, which can be explained by the fact that they are predominantly groups that are established to first render religious services. The *arisan* draws that take place are a mere by-product of the religious meeting.

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[13] They observe that "*for recurring risks, insurance against multiple events over time is possible through simultaneous membership in more than one RoSCA*"(Calomiris and Rajaraman, 1998, pg. 210)

Moreover, all three types of *arisans* (the religious *arisans* and the women's associations) are known more for a social role than a financial role. In other words, there are some *arisans* that seem to be financially driven and hence are much more effective financial instruments.

Looking at the frequency of meeting, most *arisans* tend to meet monthly or weekly. However, for market *arisans*, meeting daily is as common as meeting on a weekly basis, which is consistent with the anthropological literature[14]. Geertz (1962) in his survey of *arisan*s talks about the market *arisan* and the frequency of meeting. He writes "... most market *arisans* are daily rather than weekly or monthly affairs" (Geertz 1962, pg. 248).

Religious *arisans* tend to be conducted weekly, rather than monthly. This is probably due to the fact that several religions have denominated one particular day[15] of the week as the day for religious service.

Characteristics of Arisan participants

About 51% of households in the sample participate in an *arisan*. This is a significant proportion, and it is important to understand what one can learn about participating in an *arisan*. Data show that it is often the case that there is more than one person in the household who participates in an *arisan*, or even in the same type of *arisan*. Of the participating sample, about 24% were household heads while 47% were spouses of household heads. Further

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[14] There is also evidence in anthropological literature (e.g. Hospes 1992) that the frequency of meeting is correlated with the role that the *arisan* plays. If they play a social role, they are more likely to be weekly or monthly meetings, while those that are meant for savings, tend to be daily.

[15] For example, the Muslims have special prayers on Fridays. Similarly, Christians have chosen Sunday. These two are the predominant religions of Indonesia.

restricting the sample to only households in which both the head and spouse are participating, it becomes evident that when both of them participate, they predominantly choose different *arisan*s. This can once again be an explanation that they see the *arisan* as having different roles. This can also be evidence of different people depending on the *arisan* for different social network structures.

Furthermore, in every type of *arisan*, participation rates by spouses are greater than that of the heads[16]. This is consistent with the fact that women participate in *arisan*s more than men. In addition, I find that about 71% of participating individuals are women. There are several reasons given in the literature for why women are more likely to participate in a RoSCA. One of them is that women have less collateral and hence are less able to borrow from banks. It could also be that women rely on the RoSCA as a social network more than men. These claims will be investigated in the next section.

The graph below shows how *arisan* participation changes with respect to real monthly household per capita expenditure, LNPCE in 1997. This graph is obtained by doing a Nadaraya-Watson nonparametric regression. Bootstrapped confidence intervals at the 5% and 95% levels are drawn around the function. Quartile boundaries, as well as the poverty line[17,] are marked by vertical lines.

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[16] Here, I restricted the sample only to male-headed households.
[17] The concept of a poverty line in Indonesia is based on a daily minimum requirement of 2,100 calories per capita, with additional non-food requirements for clothing, schooling, transportation and other living costs (Suryahadi et al. 2003). However, nutrient intake data are not available in the IFLS. Thus, a relative measure of poverty using the poverty line of 2/3 of the median expenditure is used as a guesstimate of the poverty line.
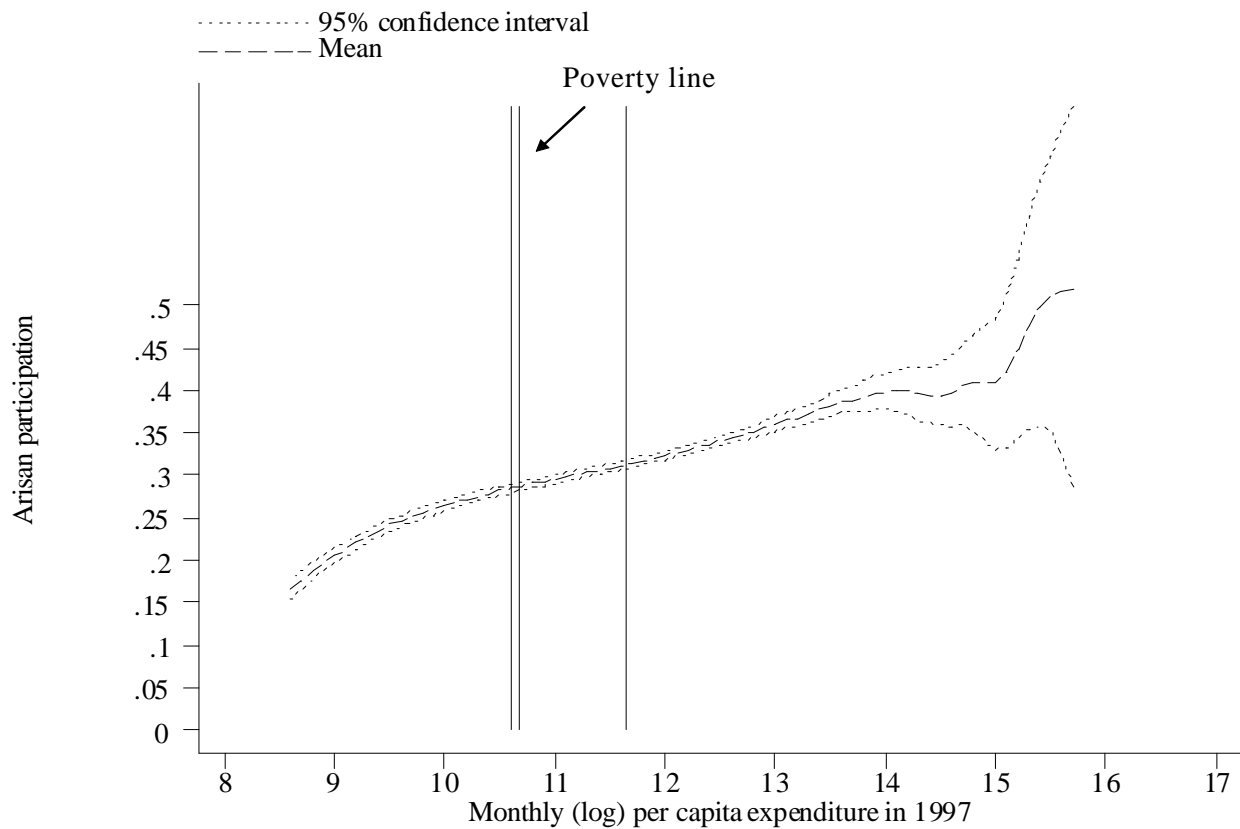
Figure 1: Kernel density estimation of *arisan* participation and log real monthly per capita expenditure (LNPCE) in 1997

The non-parametric regression suggests that a positive relation exists between *arisan* participation and income. This indicates that people who are in the upper tail of the income distribution, the rich, tend to participate more in RoSCAs than the poor, suggesting that participation by the poor is not as widespread as is believed to be.

However, income and RoSCA participation are possibly endogenous. This may be the case if *arisan*s give rise to profitable opportunities that increase income. Thus, individuals

may become better off by participating in *arisans*. In particular, since *arisans* in Indonesia are ongoing institutions, the upward slope can be a clear manifestation of their success.

As the IFLS is a panel, I use 1993 real monthly per capita expenditure (constructed from the first wave of the IFLS) as an instrument for the 1997 real monthly per capita expenditure. Plotting *arisan* participation on past expenditure, i.e. household monthly per capita expenditure in log terms in 1993, can help suggest the direction of causality between *arisan* participation and income. This is done in Figure 2

.... 95% confidence interval   – – – – – Mean
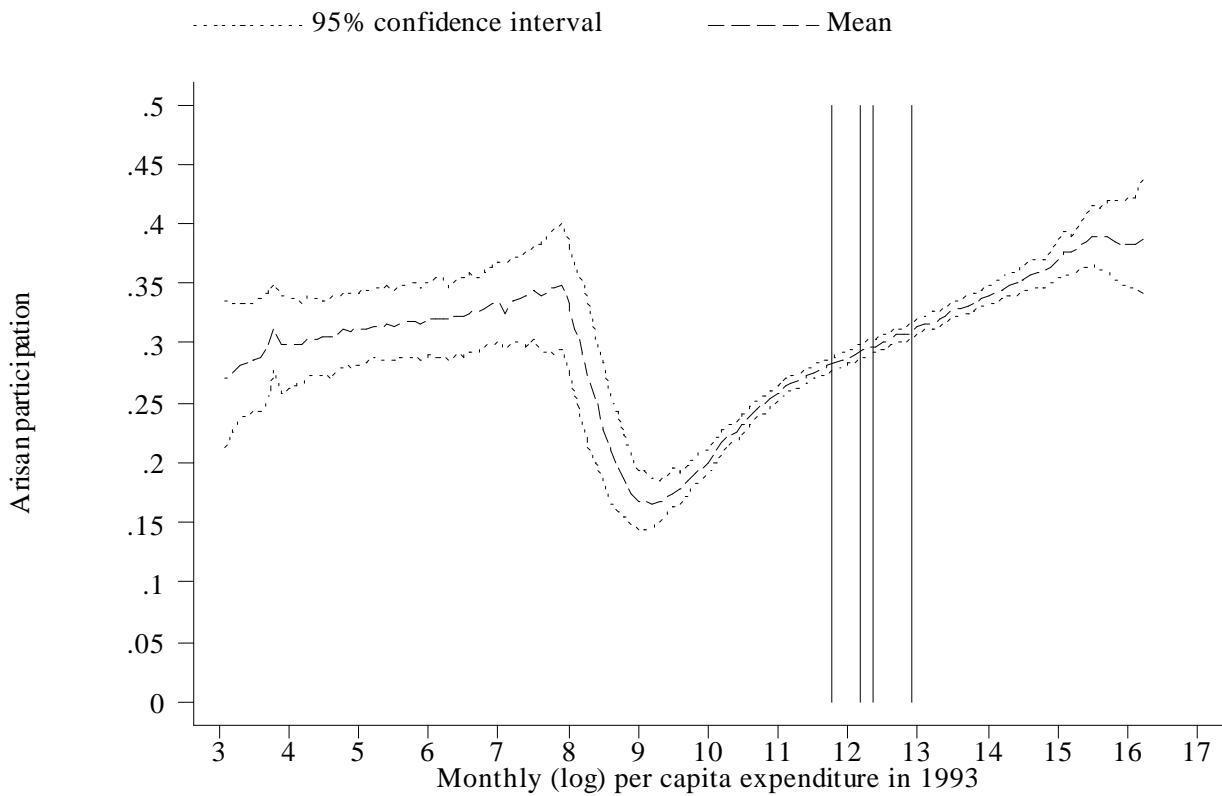
Figure 2: Kernel density estimation of *arisan* participation and log real monthly per capita expenditure (LNPCE) in 1993

By doing this, I try to correct for the upward bias that arises between *arisan* participation and income. This too has an upward slope, though a rather shallower slope than that in Figure 1 over the relevant range of the data. This provides an initial graphical suggestion that expenditure may cause *arisan* participation. This will be tested econometrically, in the next section, by instrumenting for expenditures in 1997.

A key conclusion that can be drawn from these figures is that *arisans* are not targeting instruments that can help alleviate people out of poverty. Moreover, both figures seem to suggest that the *arisan* is a substitute for formal finance for the upper and lower income class groups, while it plays a complementary role in the middle class. These issues will be further elaborated on, during the discussion of the econometric results.

III. Econometric Analysis of *Arisan* Participation

This section addresses the econometric methodology undertaken in the analysis. Two questions are answered here – who participates in the *arisan*? And why do individuals participate in more than one *arisan*?

The Explanatory variables[18]

In all regressions, I control for household characteristics such as household size[19] and its square, location (via the rural - urban dummy), age of the household head and its square and LNPCE and its square.

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[18] Appendix Table 1 presents descriptive statistics of the variables used in this analysis.
[19] Household size is normalized by a factor of 10.

Average asset ownership[20] (which is the average value of assets[21] owned by the household in 1993 and 1997) is used to indicate the likelihood of default by the participant. Assets are a proxy for permanent income and the higher your permanent income, the less likely you are to default and the more likely you are to participate in a RoSCA. Individual characteristics (such as age[22], marital status, religious affiliation, gender etc.) are also controlled for.

It would be expected that *arisans* would be formed among people who know each other quite well[23]. Two variables are used in the regressions to capture this effect. The first is a dummy variable that indicates whether the native language of the province is the language that is most spoken at home. This variable works particularly well for Indonesia, because Indonesia is a country where many provinces do not necessarily speak the same native language as each other. Hence, should you speak the native language of the province that you are living in, it would be much easier to build networks and hence join *arisan*s.

The second variable is the number of years that the individual has lived in the village. This variable can either have a positive or negative effect on *arisan* participation. One

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[20] Nearly 80% of *arisan* participating individuals own assets. Hence, it is likely that they have collateral which can be used to secure loans from the formal financial market which then seems to contradict the early economic and anthropological literature that a reason to participate in a RoSCA is the inadequate value of collateral that can help an individual secure a bank loan.

[21] The assets used to create this measure are house, other buildings, livestock, vehicles, household appliances, jewelry household furniture and utensils.

[22] Age is normalized by a factor of 100.

[23] The relationship between social connections and microfinance has been documented in the particular context of group lending (Karlan, 2002). Organizations that promote group lending provide credit on the basis of social collateral, through which borrowers' reputation, or the social networks to which they belong, take the place of traditional physical or financial collateral. However, one can extend the similar argument to the RoSCA, which is an informal institution that is formed by people willingly.

possible explanation is that individuals, who have lived in the village for a shorter time, need the *arisan* more for its social contacts and hence may join them. However, it is also possible that the longer an individual has lived in the village, the more desirable he is as a member of the *arisan* as other members will know of his credit worthiness, and trustworthiness.

Finally, I include some community specific dummies (such as whether there is a bank or a post office in the village). These variables indicate the extent to which a particular village is developed in terms of infrastructure. In addition to these variables, dummy variables that specifically capture the level of community credit infrastructure in the community are also included. Some examples are: Does the community have access to formal or informal financial institutions? Are the financial institutions associated with the village inside the village or outside? These variables can help indicate the presence of credit facilities and hence suggest whether RoSCAs are net complements or substitutes to other forms of financial institutions.

Who participates in the *arisan*?

The estimation strategy can then be written as

$$A_{ij}^* = X_{ij}\,\boldsymbol{b} + \boldsymbol{e}_{ij} \tag{1}$$

where A_{ij}^* is the latent variable of participation for person i in household j. X_{ij} is the set of explanatory variables (household, individual and community characteristics), and $\boldsymbol{e}_{ij}$ is the error term.

A probit is used to estimate the participation decision, as the propensity of an individual to participate in an *arisan* is not observed. Rather I only observe whether the individual participated in the *arisan* or not. Thus, the dependent variable, A, which is the observed participation, takes a value of 1 if the individual participates in an *arisan* and a value of 0 if the individual does not participate in an *arisan*.

Two methodological issues need to be addressed. The first arises from the possible endogeneity of household expenditure, as Figures 1 and 2 indicated. It is likely that household wealth as proxied by LNPCE is simultaneously determined by *arisan* participation. One therefore needs to instrument for LNPCE, and the primary instrument[24] used is LNPCE in 1993. The justification is that LNPCE in 1993 is likely to affect *arisan* participation in the 1997, while *arisan* participation in 1997 is not likely to affect LNPCE in 1993. Thus, the direction of causality between wealth and *arisan* participation can be isolated.

However, the problem of endogeneity is further complicated by the fact that the dependent variable is discrete, while household per capita monthly expenditure, LNPCE – the endogenous variable - is continuous. Therefore, the methodology developed by Rivers and Vuong (1988) to correct for the potential endogeneity is used. The procedure works in the following manner. First, LNPCE which is endogenous is regressed on the set of variables used in the analysis and the set of instruments. This is the first stage regression. The error terms from the first stage regression are then included as an additional regressor in the second

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[24] In addition to LNPCE in 1993, I use a set of variables that describes the physical characteristics of the house in which the individual lives in. This gives me an over-identified model, and hence a set of over-identifying restrictions.

stage estimation, which is the probit estimation of *arisan* participation. A significant coefficient on the residual terms from the 1st stage implies that the null hypothesis of exogeneity is rejected[25]. The estimation results show that the null hypothesis of exogeneity of the LNPCE and its square are generally strongly rejected.

The second issue arises from the fact that in each household, more than one household member can participate in the *arisan*. Thus, there is, in some sense, inter-dependence between the observations. For example, given that a member of the household is already participating in an *arisan*, it might be easier for a second member of the household to either become a member in the same *arisan* or to gain membership in another *arisan*. As a matter of fact, there are nearly 3000 households where more than one member is a participant of an *arisan*. This lack of independence between observations within the household results in incorrect standard errors. Therefore the standard errors are clustered on the household. This allows for correlations between the observations within each cluster[26].

Results and Discussion

Table 1 presents the probit[27] estimates that explain participation in the RoSCA. The ordinary least squares (OLS) estimates (ignoring the endogeneity of LNPCE) and the instrument variables (IV) estimates are presented here.

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[25] If there are two potentially endogenous variables, the exogeneity test is an F test on the joint significance of the two residual terms from the 1st stage regression of each endogenous variable (Maddala 1988).
[26] Although, clustering necessarily implies that the observations are independent across the clusters.
[27] All probit estimations report the marginal effects rather than the estimated coefficients.

LNPCE and its square are highly significant. Real monthly per capita expenditure has a positive effect on participation in *arisan*s while the square term has a negative effect. This implies that the returns from per capita expenditure increase at a decreasing rate. The turning point was about Rp. 210, 000, which occurs well within the range of monthly per capita expenditure, suggesting that controlling for other demographic characteristics (such as age, marital status, education etc.), the relation between *arisan* participation and per capita expenditure is an inverted U.

Prior empirical work (such as Levenson and Besley 1996b, Handa and Kirton 1999) suggests a linear rather than a quadratic relation between RoSCA participation and income. Handa and Kirton (1999) hypothesize that higher income individuals may be participating in RoSCAs due to the large transaction costs that they might incur in the formal financial market.

However, an alternate explanation for the inverted U shape is that at lower levels of income, individuals do not earn much beyond subsistence level consumption for them to participate in *arisan*s. Given the fact that contributions are a significant proportion of per capita expenditure, and that default is very much frowned upon, low income individuals may actually be deterred from participating. As the income earning potential increases, they are able to participate in *arisan*s. At high incomes, they no longer need the *arisan* for the financial reasons and may seek other financial institutions to meet their credit requirements.

Moreover, since the turning point for LNPCE is well within the range of the data, this can possibly indicate that richer individuals are actually moving away from the *arisan* and entering the formal financial markets. Thus there seems to be evidence, once again, that the *arisan* is a substitute form of finance for low and high-income individuals, while it plays a complementary role for middle-income individuals.

However, LNPCE can be endogenous. The 1st stage coefficient estimates are presented in Appendix Table 2. These are obtained by the least squares regression of LNPCE on the set of instruments[28] in addition to the explanatory variables. These instruments are not only individually significant but also jointly significant[29]. They account for about 50% of the variation in LNPCE. This suggests that the instruments are valid. However, one also needs to show that they are uncorrelated with the participation outcome. To explore this, equation (1) was re-estimated by adding the proposed instruments. I find that while some of the instruments are individually significant at the 10% level, they are all jointly insignificant at the 1% level. Although this is not a formal test, it does provide some evidence of whether the instruments are uncorrelated with the outcome of interest, *arisan* participation. This suggests that the set of proposed instruments can be used to address the endogeneity of LNPCE. Hence, the IV estimates are presented and discussed henceforth.

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[28] The set of instruments are LNPCE in 1993 and its square, number of rooms in the house, the type of roof in the house, whether the household owns the house that the householders are living in, type of toilet facility present (i.e. there is a private toilet, shared toilet or no proper toilet facility in the house, whether the household uses electricity, type of wall, type of sewage facilities, and the existence of cooking facilities.

[29] The F test of joint significance gives a value of 288.15, which is significant at 1%. The F value of the joint significance of all covariates is 382.97 which is also significant at 1%.

The urban dummy is positive and highly significant, indicating that the urban sample is more likely to participate in the *arisan* than the rural sample. Household demographics (household size and its square) were highly significant. The turning point was about 12 household members – which suggest that up to 12 household members, participation in an *arisan* increases and subsequently declines.

The age of the household head and its square had a significant effect on the participation of other individuals in the family, with the turning point occurring around 49 years. As the age of the household head initially increases, other individuals are less likely to participate in the *arisan*. As the head of the household becomes older, household members are more likely to participate in the *arisan*.

Female headship had a positive and significant effect on participation. This is expected, since female-headed households are more likely to be in need of both the financial services of the *arisan* and the social networks created by the *arisan*. As for the schooling characteristics of the head, although these variables were not individually significant, they are jointly significant at the 10% level. Average asset ownership of the household had the expected sign and was significant.

Looking at the individual characteristics, gender had a highly significant and negative effect on participation. This implies that controlling for other factors, such as income and education, men are less likely to participate in an *arisan* than women.

Age of the respondent and its square were highly significant suggesting that as the individual gets older he is less likely to participate in the *arisan*. The turning point occurs at about 39 years of age. A reason for this, which ties in well with the most popular explanation suggested in the existing literature – the purchase of durable, indivisible goods – is that at the start of your career, one does not have enough income to purchase the necessary goods, and joining the *arisan* becomes desirable as it helps one save up towards the purchase of durable goods. As individuals get older, it is probable that as a result of their past labor earnings, they have substantial savings and do not need to use the services of the *arisan* to help them purchase durable goods anymore. Moreover, it is also possible that as individuals get older, they might still join the *arisan* for other reasons (for example, because it is a commitment device towards savings or to increase their social capital).

The marital status variables were both significant. If the individual is not married, she is less likely to participate in an *arisan* compared to being previously married (divorced, separated or widowed) while if she is married, she is more likely to participate in the *arisan*. This is quite an interesting result[30] especially if one hypothesizes that she is joining an *arisan* for its economic benefits. A married woman has more strain on her own resources as she has to spend on maintaining the household. Hence she is likely to join the *arisan*. She is also more likely to be able to contribute to an *arisan* as she has the capacity to draw on her husband's income.

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[30] A similar observation was made by Anderson and Baland (2002) which led them to suggest intrahousehold bargaining as a potential explanation for participation in the RoSCA in Kenya.

The educational qualification of the individual had a very significant and positive effect on participation[31]. Relative to an individual with no education, individuals with education were more likely to participate in the *arisan*, and this effect increases with the level of education. If one were to believe that the RoSCA is for the poor, it would have to be the case that controlling for income, a person with a higher education level is less likely to participate in the RoSCA[32]. However, this is clearly not the case.

Another way to deduce this is to look at how *arisan* participation and borrowing vary with education. That is done in Figure 3 below[33].

Figure 3:
Arisan participation and borrowing on education

Years of education

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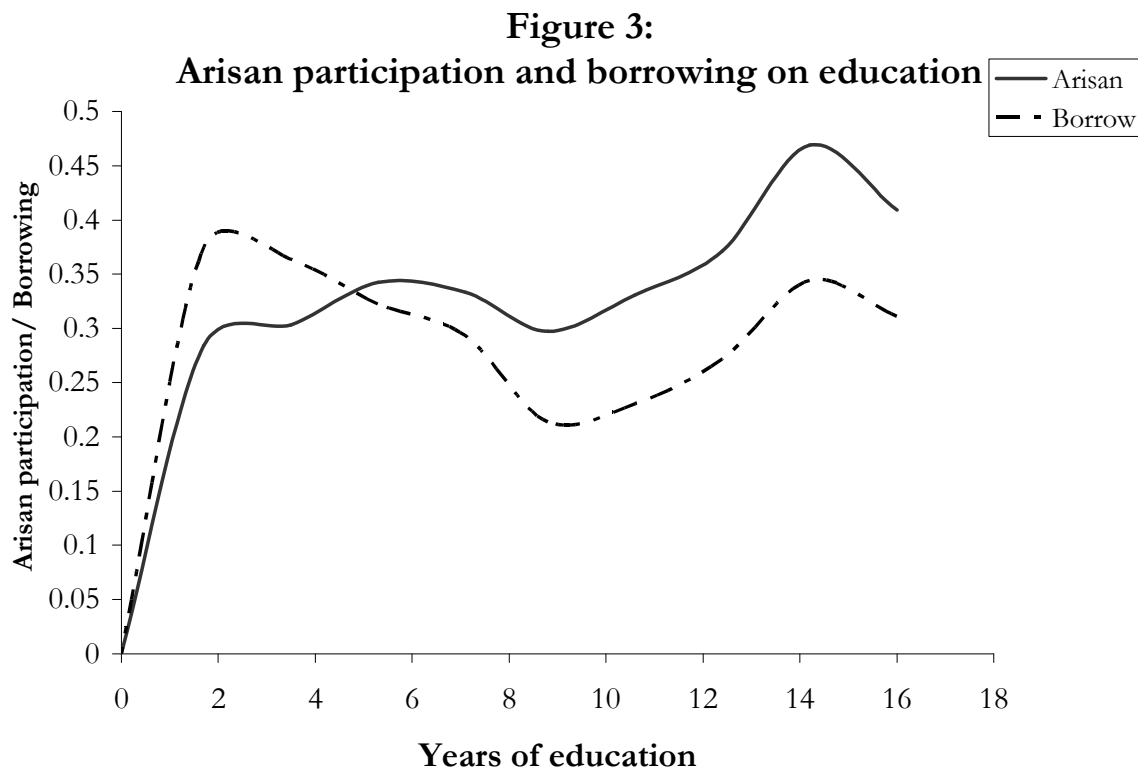
[31] Variables representing the respondent's education were also jointly significant at the 1%.
[32] This holds if we assume that the more educated an individual is, the higher is his earning capacity.
[33] These are once again Nadaraya-Watson nonparametric univariate regressions.

Two conclusions can be made from this figure. First, the less educated are not likely to participate in the *arisan*. It can be seen that at low levels of education, *arisan* participation and borrowing are inversely related to each other. That is, an individual with just two year of education is more likely to borrow than seek the RoSCA to meet his financial constraints. However, this tendency falls with subsequent years of education. After about 9 years of education (which corresponds to someone who has completed junior high), there is a remarkable positive correlation between *arisan* participation and borrowing. Second, this figure seems to suggest that individuals are not joining the *arisan* for financial reasons.

Speaking the same language as the population made it easier to participate in an *arisan*. The migration variable was also significant and positive, suggesting that *arisan*s are likely to be formed among people who know each other quite well.

Key community variables were ones representing the level of credit infrastructure in the village. Having a bank in the village encouraged participation in the *arisan*. Having access to a formal financial institution in the village (which includes private banks and others such as the Bank Rakyat Indonesia) did not have a significant effect on participation. Having the credit facility inside the village (rather than outside village) was positively correlated with participation in the *arisan*. These variables seem to imply that formal financial institutions and RoSCAs (which are a form of informal finance) are complements rather than substitutes. The existence of informal financial programs (such as the KUKESRA which is a government scheme which provides credit to the family) and the presence of money lenders in the village were also positively associated with participation. The variables representing credit

infrastructure are also jointly significant at the 1% level. This reiterates that RoSCAs are not substitutes for other credit mechanisms but rather that the *arisan*s in Indonesia can have an independent existence. This could be because participants of the *arisan*s have reason other than just credit, to join an *arisan*.

Most of the above conclusions hold when separate estimations are run, by location (i.e. rural vs. urban). These results are presented in Appendix Table 3. The turning point for LNPCE in the rural sample was much higher than that in the urban sample. Moreover, the value of assets was not significant in the rural sample. This is possibly because the rural population is likely to be much poorer[34] than the urban population, that it seems reasonable to expect them not to hold too much in the form of assets. The fact that the household head was a female has a positive effect in only the rural sample.

The turning points for age are 42 years in the urban sample, and 36 years in the rural sample. The fact that people in rural areas leave the *arisan*s at a somewhat earlier age than people in urban areas, may once again suggest that *arisan*s are not meant for the poor. The language variable was more important (in effect and significance) in the rural than the urban sample. A reason for this is that urban areas are more likely to be linguistically and ethnically diverse as compared to rural areas. Since the rural population is more homogenous, it would be expected that language plays a more important role on participation. Most of the

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[34] Looking at LNPCE by location, the average LNPCE in the urban sample was 11.43, translating to a monthly expenditure of about Rp 92,000 while in the rural sample, it was about 14 (or Rp.1, 200, 000)

conclusions about the community credit infrastructure also hold true. They are all jointly significant, although individual significance varies slightly from Table 1.

Why do individuals participate in more than one *arisan*?

It has been noted both in the anthropological literature (Geertz 1962) and this data set that Indonesians are participating in more than one *arisan*. This section therefore tries to understand why an individual might participate in more than one *arisan*.

In order to do this, an ordered probit of participation is estimated. Three categories are being considered here:

i)   the respondent does not participate in the *arisan*

ii)   the respondent participates in just one *arisan*, and

iii)   the respondent participates in more than one *arisan*.

The ordered probit is built around the latent regression in the same way as the binomial probit model. This begins with

$$A_{ij}^* = X_{ij}\,\boldsymbol{b} + \boldsymbol{e}_{ij} \tag{2}$$

where A_{ij}^* is the propensity to participate in an *arisan*. Since A_{ij}^* is not observed, one would define a variable, A, in the following way[35].

$A_{ij} = 0$ \qquad if $A_{ij}^* \le \boldsymbol{m}_1$

$A_{ij} = 1$ \qquad if $\boldsymbol{m}_1 \le A_{ij}^* \le \boldsymbol{m}_2$

$A_{ij} = 2$ \qquad if $\boldsymbol{m}_2 \le A_{ij}^*$

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[35] Since there are only three choice categories, I have restricted this definition to three outcomes.

The m's are unknown parameters that have to be estimated along with the bs[36]. It is assumed that the errors, e_{ij}, are normally distributed with the mean and variance normalized to zero and one respectively. With this normal distribution, the probability of each outcome occurring is:

$$\Pr(y = 0) = \Phi(m_1 - X_{ij}b)$$

$$\Pr(y = 1) = \Phi(m_2 - X_{ij}b) - \Phi(m_1 - X_{ij}b)$$

$$\Pr(y = 2) = 1 - \Phi(m_2 - X_{ij}b)$$

where Φ is the cumulative function of a normal distribution. A likelihood function can then be constructed, and estimation of the unknown parameters proceeds by maximum likelihood.

Discussion of the Ordered Probit estimates

Results[37] from the estimation of the ordered probit are presented in Table 2. Once again, most of the conclusions from Table 1 hold. For example, monthly per capita expenditure, predicted LNPCE is significantly negative for outcome 1 (not being a participant) while it is significantly positive for outcomes 2 and 3. This suggests that as income increases, an individual is less likely not to participate in the *arisan* and more likely to participate in either one or more than one *arisan*s. Similarly the gender and age of the individual are both significant in the right direction.

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[36] If an intercept term is included in (2), then it is customary to set m_1 to zero, as a normalization (Greene 2000)
[37] Marginal effects are presented.

This is also true of the variables that proxy for the availability of alternative forms of credit in the village. Having a bank or a credit facility in the village improves the participation in at least one *arisan*. It also has a significant effect on participating in more than one *arisan*.

However, the limitation of this analysis is that one cannot go beyond this and try to decipher why people participate in more than one *arisan*. A variable that is a good predictor of participating in an *arisan* also turns out to be a good predictor of participating in more than one *arisan*. This suggests that it is more important to understand why individuals participate in the *arisan* in the first place, rather than understanding why they participate in more than one *arisan*[38].

IV. Are participants of the *arisan* likely to be credit constrained?

This section looks to provide evidence on the belief that people who join RoSCAs are credit constrained. The sample is restricted to those individuals for whom there is information[39] on whether the respondent was credit constrained[40] or not. Individuals, who indicated that that they tried to borrow money, although they did not succeed, were classified as credit constrained. If they did borrow money, then they are not credit constrained. In this exercise, I drop all individuals who did not borrow money or did not try to borrow money. This is because, I am not certain whether these individuals did not need to borrow or because

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[38] Perhaps a better estimation technique would be to model the participation decision as a two-stage process. In the first stage, the individual decides whether to participate in the *arisan* or not. In the second stage he decides how many *arisans* to participate in. However, in order to estimate such a model, one needs a variable that can distinguish between the two layers of choice. It is not immediately clear to me what such a variable will be.
[39] The survey question reads "In the past 12 months, have you ever borrowed money?" Respondents can either answer: No, but I tried; No, I never borrowed nor tried to borrow; Yes.
[40] However, there is no way to know if they were quantity constrained.

they knew *a priori* that they would not be able to borrow money. This variable, ***credit constrained***, can give some evidence on whether the argument that people who join RoSCAs are in general credit constrained is valid.

Table 3 presents descriptive statistics for the sample restricted to having information on being credit constrained. There are about 12 500 individuals for whom, I am not sure if they are credit constrained or not, either because they declined to answer the question or because they never attempted to get a loan and hence were dropped[41].

The estimation methodology follows in the similar manner as in the earlier section. First, a binomial probit model is estimated. Subsequently an ordered probit of *arisan* participation is estimated. However, in addition to all the other explanatory variables, the ***credit constrained*** variable is also an explanatory variable.

Discussion of results

Table 4 presents results from of the simple probit model of participation, including an explanatory variable to indicate if the individual was credit constrained. The main results of Table 1 and 2 do not change significantly. The key finding here is that the dummy variable indicating that the individual is credit constrained is highly significant and negative. This implies that if an individual is credit constrained, he is less likely to join an *arisan*. This is an interesting result, as it seems to refute the traditional assumption that prevails in the theoretical literature that participants of the RoSCA are credit constrained.

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[41] Although there is a likely selection issue in restricting the sample, I am not addressing it here.

Moreover, the effect of this variable is larger in the urban sample than the rural sample. Being credit constrained decreases the probability of joining an *arisan* by 17% in the urban sample, while this effect is only 10% in the rural sample.

Results of the ordered probit model for restricted sample are presented in Table 5. Once again the preceding conclusions follow through. In particular, being credit constrained has a positive effect on not participating in an *arisan*, and a negative effect on participating in one or more than one *arisan*. These ordered probit results strengthen the previous conclusions by serving as a robustness check.

A key issue in understanding participation in the *arisan* is the possible endogeneity with other existing projects. This is especially true in Indonesia where it is quite possible that the *arisan* emerges as a byproduct of other projects that bring people together. Hence understanding why some areas have higher *arisan* participation than others is imperative. Although this was alluded to in Section 1.2, the endogeneity of existing projects was not addressed in the discussion until now. This was partly because it is very difficult to separate out the various reasons for joining an *arisan*.

A preliminary way in which to tackle this endogeneity is to look at the relationship between *arisan* participation and other developmental and volunteer projects (such as sanitation and public works, or youth library etc.) in the village. If places that have more development projects also tend to have higher *arisan* participation, then one can stipulate that there is greater associational activity in these areas, which causes higher *arisan* participation.

However, if there is no significant relationship between the existence of development projects and RoSCA participation, then it might just be that RoSCAs are formed when certain groups of people get together. Its formation is thus completely determined by its membership, which is formed due to some other activity.

I ran a separate set of regressions[42] to test this hypothesis. The results indicated very few positive and significant relationships between development projects and each type of *arisan* participation. This suggests that placement effects are not very important.

V. Conclusion

This chapter looks at the determinants of individual participation in the Indonesian RoSCA, the *arisan*, a topic that has not been studied in the literature till now. It is also the first to study RoSCAs using a large, nationally representative sample.

This chapter tests the common assumptions about the RoSCA. I find that in Indonesia, RoSCAs are not meant for the poor, and that participation by the poor is not widespread. Rather, the rich are more likely to participate in the *arisan*.

Participation in the *arisan* (controlling for other demographic characteristics) initially increases with income and subsequently, decreases with income. This confirms that the relation between RoSCA participation and income is quadratic. In addition to this, the simultaneity issue between participation in a RoSCA and income was addressed in this paper

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[42] Results can be obtained from the author.

– first graphically and subsequently, econometrically. Both methodologies suggest that people with higher income tend to participate in RoSCAs.

Understanding why the rich participate in the RoSCA rather than going to a formal institution is important. One reason could be that the social sanctions that are in place to prevent default are very strong. Thus, the poor are deterred from participating. Another reason is that RoSCAs can possibly undertake screening and sorting[43] of its members thus excluding the poor, who may not have adequate disposable income. The richer individuals may participate in the RoSCA due to the flexibility it offers in terms of selecting the contribution rates, membership etc. These are possible reasons to explain the upward sloping relationship between RoSCA participation and income

The paper also provides empirical evidence that people are not necessarily credit constrained when they join RoSCAs. This seems to invalidate one of the reasons for why individuals participate in RoSCAs - they cannot borrow from the formal sector. Moreover, it was shown that RoSCAs can and do co-exist with formal financial institutions.

Although this paper has shown that the poor and the credit constrained individuals are not likely to participate in the RoSCA, it has begged the question of why do individuals participate in the RoSCA. After all, the RoSCA is a social construct with a finite probability

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[43] Gugerty (2000) notices this in her study of RoSCAs in Kenya. She notes " ... *half the RoSCAs investigated potential ability to pay by making an assessment of the individual's financial position such as whether she ran a small business or trade or had some other sources of income with which to make payments".*

of default, which should act as a deterrent to participation. Yet, participation in the RoSCA is widespread.

Several reasons have been suggested for why individuals participate in the RoSCA. Anderson and Baland (2002) suggest that intra-household conflict over savings and consumption patterns encourages women (rather than men) to participate in the RoSCA. Using data from RoSCAs in a low-income neighborhood in Nairobi, Anderson and Baland (2002) first note that the participation rates of women in RoSCAs in a low-income area of Nairobi are higher than for men They then develop a theoretical model, which they empirically test, where RoSCA participation is positively related to a woman's bargaining position in the household, as measured by her contribution to household income. However, the intrahousehold argument is not likely to hold in Indonesia, as the husbands know that their wives are participating in the *arisan*[44].

A more plausible explanation is one of forced savings (Gugerty, 2000, Aliber 2000), where they argue that the RoSCA provides participants with the opportunity to safely keep their funds, from both themselves, and the demands of others. Thus the RoSCA improves the level of individual financial responsibility. However, this hypothesis is difficult to convincingly test using data.

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[44] But, if household conflict drove RoSCA participation and women were unable to exert control over their own income, it also seems plausible that husbands will not allow their wives to join the *arisan*. Moreover, Anderson and Baland (2002) argue that once the lump sum is accumulated, the husband's preference are in line with his wife's – i.e. he prefers to spend the lump sum on indivisible items, rather than status enhancing consumption goods. If this were the case, then husbands are likely to suffer from time-inconsistency and use their wife's participation as a commitment strategy.

Another competing hypothesis is one of social capital and networks. Geertz (1962) claims that "... the primary attraction of the *arisan* is not the money you receive, but the creation of *rukun* (communal harmony) which occurs, the example of *gotong rojong* (mutual assistance) which is demonstrated". By joining the RoSCA, one builds upon his social networks, by interacting with his peers and building on his contacts, and thus increases his social capital. Moreover, building social capital can also explain participation in more than one RoSCA as each RoSCA varies in terms of the value of social capital that it generates[45].

These conclusions also offer suggestions for micro-finance for the poor. It is clearly evident, at least in the case of Indonesia that the poor do not participate in RoSCAs. Thus, one cannot assume that if RoSCAs exist, micro-finance schemes need not be established for the poor. Rather, it seems to suggest that the RoSCA is actually a substitute for micro-finance schemes, which are targeted towards the poor. Moreover, the RoSCA is a flexible design that takes into consideration the financial abilities and limitations of its members. Therefore, it offers a stable, sustainable design that should be looked at in designing other micro finance schemes.

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[45] The observation that individuals participate in more than one RoSCA cannot be explained by the commitment device to forced savings argument.

References

Aliber. M.A. 2000. Rotating Savings and Credit Associations and the Control of Dynamic Inconsistency: A South African case study. Ph.D. Dissertation. University of Wiscosin – Madison.

Adams, D.W., Fitchett, D.A. (Eds.), 1992. Informal finance in Low-Income countries. Westview Press, Colorado.

Anderson, S., Baland, J. 2002. The economics of RoSCAs and Intrahousehold resource allocation. Quarterly Journal of Economics, 117, 963-995

Ardener, S., 1964. The comparative study of rotating credit associations. Journal of the Royal Anthropological Society of Great Britain and Ireland 94, 201-229.

Arderner,S., Burman,S. (1995) (Eds.) Money-Go-Rounds: The importance of Rotating and Savings Credit Associations for Women. Berg Publishers Limited, Oxford.

Besley, T. Coate, S. Loury, G., 1992. On the allocative performance of Rotating Savings and Credit Associations. Research Program in Development Studies at Princeton University Discussion Paper No. 163.

Besley, T. Coate, S. Loury, G., 1993. The Economics of Rotating Savings and Credit Associations. The American Economic Review 83, 792-810.

Besley, T. Coate, S. Loury, G., 1994. Rotating Savings and Credit Associations, Credit markets and efficiency. Review of Economic Studies 61, 701-719.

Bouman, F.J.A., 1997. Indigenous Savings and Credit Societies in the third world: A message. Savings and Development 1, 181-218.

Calomiris, C.W., Rajaraman, I., 1998. The Role of RoSCAs: lumpy durable or event insurance. Journal of Development Economics 56, 207-216.

Frankenberg, E. and D. Thomas. "The Indonesia Family Life Survey (IFLS): Study Design and Results from Waves 1 and 2. DRU-2238/1-NIA/NICHD.

Geertz, C., 1962. The Rotating Credit association: A `middle rung' in development. Economic Development and Cultural change 10, 241-263.

Ghate, P. (Eds.), 1992 Informal Finance: Some findings from Asia. Oxford University Press, Hong Kong.

Greene, W.H., 2000. Econometric Analysis. Prentice Hall Incorporated. USA.

Grootaert, C., 1999 Social Capital, Household Welfare, and Poverty in Indonesia. World Bank Working paper

Gugerty, M.K., 2000. You can't save alone: Testing theories of Rotating Savings and Credit Associations. Mimeo. Harvard University.

Handa, S., Kirton, C., 1999. The economics of rotating savings and credit associations: Evidence from the Jamaican Partner. Journal of Development Economics 60, 173-194.

Hospes, O., 1992a. Evolving forms of informal finance in an Indonesian town. In: Adam, D.W., Fitchett, D. A. (Eds.), Informal finance in low income countries. Westview Press, Colorado.

Hospes, O., 1992b. People that count: The forgotten faces of Rotating Savings and Credit Associations in Indonesia. Savings and Development 16, 371-96.

Hospes, O., 1995. RoSCAs in Indonesia. In Arderner,S., Burman,S.,1995. (Eds.) Money-Go Rounds: The importance of Rotating and Savings Credit Associations for Women. Berg Publishers Limited, Oxford.

Karlan, D., 2002. Social Capital and Group Banking. Working Paper, Princeton University.

Kurtz, D.V., 1973. The Rotating Credit Association: An adaptation to Poverty. Human Organization: Journal of the Society for Applied Anthropology Spring 32, 49-58.

Levenson, A.R., Besley, T., 1996a. The Role of Informal finance in Household capital Accumulation: Evidence from Taiwan. Economic Journal 106, 39-59.

Levenson, A.R., Besley, T., 1996b. The anatomy of an informal financial market: RoSCA participation in Taiwan. Journal of Development economics 51, 45-68.

Maddala, G.S., 1988. Introduction to Econometrics. Macmillan Publishing, New York.

Morduch, J., 1999. The Microfinance Promise. Journal of Economic Literature. December 1999, 1569-1614.

Morduch, J., 2000. The Microfinance Schism. World Development 28, 617-629.

Narayan,D., Prtichett,L., 1999. Cents and Sociability: Household Income and Social Capital in Rural Tanzania. Economic Development and Cultural Change 47, 871-93.

Suryahadi, A., Pradhan, M., Sumarto, S., Pritchett, L., 2000. Measurements of Poverty in Indonesia, 1996, 1999 and Beyond. World Bank Working Paper No. 2438, World Bank, Washington D.C.

Rivers, D., Vuong, Q., 1988. Limited Information Estimators and Exogeneity tests for Simultaneous Probit Models. Journal of Econometrics 39, 347-366.

Van der Brink,R., Chavas, J., 1997. The Microeconomics of an Indigenous African
      Institution: The Rotating Savings and Credit Association. Economic Development and
      Cultural Change 45, 745-772.

Williams,G., Johnston,M., 1983. The *arisan*: A tool for Economic and Social development.
      Prisma 29, 66-73.

Table 1: Determinants of the probability of participating in an *arisan*

	OLS		IV	
	Marginal Effects	T-Values	Marginal Effects	T-Values
Household Characteristics				
LNPCE	0.553***	5.08	1.621***	6.88
LNPCE - square	-0.023***	4.76	-0.066***	6.36
Average value of assets in 1993 and 1997 (in logs)	0.016***	6.44	0.006**	2.57
Location: (1) if urban	0.028**	2.40	-0.008	0.75
Household size	-0.024	0.52	0.185***	3.70
Household size - square	-0.011	0.43	-0.075***	3.00
Age of the household head	-0.378*	1.67	-0.526***	2.67
Age of the household head - square	0.378*	1.72	0.537***	2.82
(1) if the head of the household is female	0.013	0.92	0.023*	1.84
Head's schooling: (1) some schooling	-0.001	0.08	-0.017	1.30
Head's schooling: (1) if high school	0.027	1.49	-0.004	0.23
Head's schooling: (1) if college education	0.074***	2.64	0.028	1.13
Respondent's Characteristics				
Gender: (1) if male	-0.223***	32.08	-0.222***	30.46
Age of respondent	1.345***	8.43	1.338***	8.77
Age of respondent - square	-1.704***	9.78	-1.712***	10.19
Marital status: (1) if respondent is not married	-0.076***	3.87	-0.079***	4.17
Marital status: (1) if respondent is married	0.094***	6.28	0.093***	6.39
Respondent's schooling: (1) if some schooling	0.109***	8.19	0.101***	7.51
Respondent's schooling: (1) if high schooling	0.164***	9.60	0.144***	8.54
Respondent's schooling: (1) if college	0.172***	6.48	0.142***	5.34
Religion: (1) if Islam	0.211***	4.89	0.217***	6.96
Religion: (1) if Protestant	0.137**	2.13	0.166***	3.34
Religion: (1) if Catholic	0.353***	4.84	0.375***	6.77
Religion: (1) if Hindu	0.083	1.31	0.088*	1.82
Respondent speaks the commonly spoken language	0.081***	8.21	0.089***	10.39
Years that respondent has lived in the village	0.001**	2.25	0.001***	2.78

Table 1 (Continued)

	OLS		IV	
	Marginal Effects	T-Values	Marginal Effects	T-Values
Community Characteristics				
A bus-stop is present in the village	-0.048***	4.57	-0.047***	5.22
A market is present in the village	0.010	1.05	0.020**	2.45
A public phone is present in the village	0.024**	2.03	0.012	1.14
A post office is present in the village	0.045***	3.39	0.060***	5.34
A bank is present in the village	0.025**	1.99	0.021**	1.97
A terminal is present in the village	-0.042***	4.34	-0.044***	5.35
Community credit infrastucture				
Access to a formal financial institition	0.020	0.57	-0.025	0.69
At least one Credit facility present in the village	0.066***	6.67	0.064***	7.72
Access to informal credit associations	0.015*	1.65	0.014*	1.85
Presence of a money lender in the village	0.035***	3.70	0.031***	3.87
Residuals from the 1st stage			-0.109***	6.48
Residuals from the 1st stage - square			0.023***	2.67
c2 test statistics for joint significance of				
Residuals			47.13	0.00
Marriage	174.39	0.00	200.87	0.00
Head's schooling	11.92	0.01	6.53	0.09
Respondent's schooling	94.14	0.00	74.94	0.00
Community Characteristics	63.40	0.00	96.14	0.00
Community credit infrastructure	70.12	0.00	84.50	0.00
All Covariates	2573.35	0.00	3340.09	0.00
Pseudo R-squared	0.149		0.152	
Log likelihood	-9364		-9342	

Notes: No. of observations is 18132. For the IV estimates, predicted LNPCE is used. Robust standard errors allowing for clustering at the household level are calculated; * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 2 : Ordered Probit estimates of participating in an *arisan*

	Not a participant		Participating in 1 arisan		Participating in more than one arisan	
	Marginal Effects	T-value	Marginal Effects	T-value	Marginal Effects	T-value
Household Characteristics						
Predicted LNPCE	-1.393***	5.22	1.004***	5.16	0.389***	5.44
Predicted LNPCE - square	0.055***	4.70	-0.040***	4.65	-0.015***	4.87
Average value of assets in 1993 and 1997 (in logs)	-0.006**	2.21	0.004**	2.21	0.002**	2.20
Location: (1) if urban	0.022*	1.70	-0.016*	1.70	-0.006*	1.70
Household size	-0.192***	3.65	0.138***	3.64	0.054***	3.65
Household size - square	0.074***	2.97	-0.054***	2.97	-0.021***	2.97
Age of the household head	0.559***	2.61	-0.403***	2.61	-0.156***	2.60
Age of the household head - square	-0.581***	2.77	0.419***	2.77	0.162***	2.76
(1) if the head of the household is female	-0.028**	2.05	0.020**	2.08	0.008**	1.98
Head's schooling: (1) some schooling	0.014	0.97	-0.010	0.97	-0.004	0.98
Head's schooling: (1) high school	-0.002	0.12	0.001	0.12	0.001	0.12
Head's schooling: (1) if college	-0.037	1.32	0.026	1.34	0.011	1.24
Respondent's characteristics						
Gender: (1) if male	0.229***	33.33	-0.163***	32.37	-0.065***	27.26
Age of respondent	-1.468***	9.80	1.058***	9.69	0.41***	9.56
Age of respondent - square	1.799***	10.93	-1.297***	10.76	-0.502***	10.62
Marital status: (1) if respondent is not married	0.077***	4.33	-0.057***	4.25	-0.020***	4.55
Marital status: (1) if respondent is married	-0.098***	7.26	0.071***	7.16	0.026***	7.36
Respondent's schooling: (1) if some schooling	-0.106***	8.18	0.076***	8.41	0.031***	7.89
Respondent's schooling: (1) if high schooling	-0.160***	9.19	0.111***	9.84	0.049***	8.35
Respondent's schooling: (1) if college	-0.160***	5.70	0.104***	6.57	0.057***	4.66

Table 2 (Continued)

	Not a participant		Participating in 1 arisan		Participating in more than one arisan	
	Marginal Effects	T-value	Marginal Effects	T-value	Marginal Effects	T-value
Religion: (1) if Islam	-0.214***	7.02	0.168***	6.59	0.046***	8.74
Religion: (1) if Protestant	-0.161**	2.23	0.104**	2.53	0.057*	1.81
Religion: (1) if Catholic	-0.400***	5.55	0.194***	15.47	0.207***	3.38
Religion: (1) if Hindu	-0.084	1.23	0.058	1.30	0.027	1.10
Respondent speaks the commonly spoken language	-0.095***	10.64	0.070***	10.45	0.025***	10.78
Years that respondent has lived in the village	-0.001***	3.15	0.001***	3.15	0.001***	3.14
Community Characteristics						
A bus-stop is present in the village	0.052***	5.39	-0.038***	5.31	-0.014***	5.51
A market is present in the village	-0.020**	2.16	0.015**	2.17	0.008**	2.15
A public phone is present in the village	-0.016	1.35	0.020	1.35	0.005	1.34
A post office is present in the village	-0.059***	4.59	0.042***	4.71	0.017***	4.33
A bank is present in the village	-0.018	1.56	0.013	1.56	0.005	1.54
A terminal is present in the village	0.043***	4.63	-0.031***	4.63	-0.012***	4.60
Community credit infrastructure						
Access to a formal financial instititution	0.012	0.31	-0.008	0.31	-0.003	0.30
At least one Credit facility present in the village	-0.064***	6.95	0.047***	6.89	0.018***	7.01
Access to informal credit associations	-0.013	1.45	0.009	1.45	0.003	1.46
Presence of a money lender in the village	-0.020***	3.27	0.021***	3.30	0.008***	3.18

Table 2 (Continued)

	Not a participant		Participating in 1 arisan		Participating in more than one arisan	
	Marginal Effects	T-value	Marginal Effects	T-value	Marginal Effects	T-value
c2 test statistics for joint significance of						
Residuals	49.63	0.00				
Marriage	209.41	0.00				
Head's schooling	4.33	0.23				
Respondent's schooling	101.46	0.00				
Community Characteristics	80.76	0.00				
Community credit infrastructure	66.05	0.00				
All covariates	2909.04	0.00				
Pseudo R-squared	0.140					
Log likelihood	12104					

Note: Robust standard errors allowing for clustering at the household level are calculated. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 3: Table of Descriptive statistics for the restricted sample

Variable	Mean	Std. Dev
Dependent variable: Arisan participation	0.379	0.485
Household characteristics		
Real monthly per capita expenditure (in logs)	11.213	0.749
Real monthly per capita expenditure (in logs - square)	126.284	16.974
Average value of assets in 1993 and 1997	15.813	1.994
Location: (1) if urban	0.492	0.500
Household size	0.599	0.266
Household size - square term	0.429	0.493
Age of the head	0.478	0.127
Age of the head - square	0.245	0.129
(1) if head of the household is female	0.121	0.327
Education characteristics of the head of household		
(1) if he has no education	0.128	0.334
(1) if he has primariy education	0.516	0.500
(1) if he has high school education	0.288	0.453
(1) if he has college education	0.067	0.250
Respondent, R's characteristics		
Gender of Respondent: (1) if male	0.512	0.500
Age of the Respondent	0.384	0.141
Age of the Respondent - square	0.167	0.119
Marital status		
(1) if respondent is not married	0.167	0.373
(1) if respondent is married	0.762	0.426
(1) if respondent is separated, divorced or widowed	0.071	0.257
Respondent's education levels		
(1) if respondent has no education	0.109	0.311
(1) if respondent has at least primary schooling	0.468	0.499
(1) if respondent has gone to high school	0.351	0.477
(1) if respondent has college education	0.072	0.259
Religious affiliation		
(1) if Islam	0.852	0.355
(1) if Protestant	0.044	0.205
(1) if Catholic	0.023	0.148
(1) if Hindu	0.072	0.259
(1) if other	0.010	0.098
Respondent speaks the commonly spoken language in the community	0.735	0.441
Years respondent has lived in the village	21.659	13.270

Table 3 (Continued)

Variable	Mean	Std. Dev
Community characteristics		
A bus-stop is present in the village	0.251	0.434
A market is present in the village	0.384	0.487
A public phone is present in the village	0.446	0.497
A post office is present in the village	0.234	0.424
A bank is present in the village	0.386	0.487
A terminal is present in the village	0.524	0.499
Community credit characteristics		
People have access to a formal financial institution	0.991	0.097
There is at least one credit facility present in the village	0.657	0.475
People have access to informal credit associations	0.707	0.455
There is a money lender in the village	0.301	0.459
Instruments for LNPCE		
Real monthly per capita expenditure in 1993 (logs)	12.222	1.551
Real monthly per capita expenditure in 1993 (logs - square)	151.795	31.446
No. of rooms in the house	5.344	2.127
Type of roof: (1) if it is made of concrete or wood	0.016	0.124
Household owns the house they live in	0.837	0.370
Type of toilet: (1) if a private toilet is present	0.2824	0.450
Type of toilet: (1) if shared toilets are present	0.083	0.276
Type of toilet: (1) if there is a lack of proper toilet facilities	0.282	0.450
Type of flooring: (1) if there is a ceramic, tile or cement flooring	0.724	0.447
A proper garbage disposal mechanism exists	0.670	0.470
Type of wall: (1) if it is made of cement or prefabricated bricks	0.635	0.481
Type of sewage disposal: (1) if there is a flowing drainage ditch	0.435	0.496

Table 4: Determinants of the probability of participating in an *arisan*, for the restricted sample

	General		Urban		Rural	
	Marginal Effects	T-value	Marginal Effects	T-value	Marginal Effects	T-value
Household Characteristics						
Predicted LNPCE	2.341***	4.92	2.489***	3.09	1.412*	1.72
Predicted LNPCE - square	-0.098***	4.66	-0.107***	3.09	-0.053	1.43
Average value of assets owned in 1993 and 1997 (in logs)	0.012**	2.38	0.019***	3.18	-0.004	0.39
Location: (1) if urban	-0.001	0.04				
Household size	0.222**	2.28	0.016	0.12	0.449***	3.03
Household size - square	-0.100**	2.18	-0.025	0.40	-0.183***	2.61
Age of the household head	-1.007**	2.36	-0.942	1.48	-1.051*	1.90
Age of the household head - square	1.151***	2.78	1.049*	1.70	1.282**	2.37
(1) if the head of the household is female	0.007	0.26	-0.049	1.31	0.084**	2.19
Head's schooling: (1) some schooling	-0.027	0.96	-0.019	0.38	-0.002	0.05
Head's schooling: (1) if high school	-0.011	0.30	0.014	0.23	0.005	0.11
Head's schooling: (1) if college education	0.009	0.17	-0.019	0.25	0.149*	1.80
Respondent's characteristics						
Are you credit constrained? (1) if yes	**-0.133***	**8.31**	**-0.169***	**7.31**	**-0.097***	**4.40**
Gender: (1) if male	-0.294***	19.61	-0.315***	14.24	-0.263***	13.32
Age of respondent	1.585***	4.28	2.053***	3.80	1.087**	2.18
Age of respondent - square	-1.888***	4.60	-2.283***	3.85	-1.484***	2.65
Marital status: (1) if respondent is not married	-0.133***	3.13	-0.150**	2.43	-0.081	1.35
Marital status: (1) if respondent is married	0.031	0.94	0.036	0.76	0.035	0.76
Respondent's schooling: (1) if some schooling	0.153***	5.12	0.147***	2.74	0.122***	3.62
Respondent's schooling: (1) if high schooling	0.220***	5.95	0.225***	3.80	0.183***	3.73
Respondent's schooling: (1) if college education	0.237***	4.54	0.275***	3.75	0.145*	1.80
Religion: (1) if Islam	0.258***	3.39	0.458***	3.44	-0.011	0.10
Religion: (1) if Protestant	0.138	1.36	0.433**	2.52	-0.168	1.62
Religion: (1) if Catholic	0.420***	4.06	0.545***	3.82	0.200	1.35
Religion: (1) if Hindu	0.065	0.66	0.477***	2.90	-0.229**	2.54
Respondent speaks the commonly spoken language	0.099***	5.35	0.068**	2.26	0.115***	4.91
Years that respondent has lived in the village	-0.001	1.02	-0.001	0.88	0.000	0.01

Table 4 (Continued)

	General		Urban		Rural	
	Marginal Effects	T-value	Marginal Effects	T-value	Marginal Effects	T-value
Religion of Respondent						
(1) if Islam	0.258***	3.39	0.458***	3.44	-0.011	0.10
(1) if Protestant	0.138	1.36	0.433**	2.52	-0.168	1.62
(1) if Catholic	0.420***	4.06	0.545***	3.82	0.200	1.35
(1) if Hindu	0.065	0.66	0.477***	2.90	-0.229**	2.54
Respondent speaks the commonly spoken language	0.099***	5.35	0.068**	2.26	0.115***	4.91
Years that respondent has lived in the village	-0.001	1.02	-0.001	0.88	0.000	0.01
Community Characteristics						
A bus-stop is present in the village	-0.059***	3.16	-0.053**	2.07	-0.045	1.60
A market is present in the village	0.044***	2.64	0.026	1.03	0.045*	1.95
A public phone is present in the village	0.014	0.63	0.052*	1.67	-0.017	0.52
A post office is present in the village	0.076***	3.37	0.060**	2.15	0.047	1.07
A bank is present in the village	0.005	0.22	0.011	0.35	0.033	0.99
A terminal is present in the village	-0.060***	3.58	-0.006	0.21	-0.101***	4.60
Community credit infrastructure						
Access to a formal financial instititution	-0.095	1.17	0.101	0.57	-0.121	1.39
At least one Credit facility present in the village	0.085***	4.88	0.082***	2.71	0.073***	3.55
Access to informal credit associations	0.020	1.26	0.009	0.36	0.032	1.50
Presence of a money lender in the village	0.011	0.66	0.032	1.33	-0.009	0.40
Residuals from the 1st stage	-0.107***	3.13	-0.176***	3.32	-0.186***	3.75
Residuals from the 1st stage - square	0.034*	1.96	0.042	1.32	0.007	0.28

Table 4 (Continued)

	General		Urban		Rural	
	Test Statistic	P-Value	Test Statistic	P-Value	Test Statistic	P-Value
χ2 test statistics for joint significance of						
Residuals	13.11	0.00	10.20	0.00	14.08	0.00
Marriage	28.75	0.00	17.24	0.00	7.57	0.02
Head's schooling	1.76	0.62	1.54	0.67	4.32	0.29
Respondent's schooling	36.20	0.00	16.57	0.00	15.77	0.00
Community Characteristics	39.05	0.00	16.93	0.00	35.88	0.00
Community credit infrastructure	26.99	0.00	9.94	0.00	16.49	0.00
All covariates	1206.84	0.00	591.39	0.00	592.59	0.00
Pseudo R-squared	0.169		0.163		0.175	
Log Likelihood	-2959		-1519		-1400	
Observations	5369		2641		2728	

Table 5: Ordered Probit Estimates of Participating in *arisans* (restricted sample)

	Not a Participant		Participating in 1 arisan only		Participating in more than one arisan	
	Marginal Effects	T-value	Marginal Effects	T-value	Marginal Effects	T-value
Household Characteristics						
Predicted LNPCE	-1.751***	3.76	1.149***	3.73	0.602***	3.75
Predicted LNPCE - square	0.071***	3.48	-0.047***	3.46	-0.025***	3.48
Average value of assets in 1993 and 1997 (in logs)	-0.015***	2.68	0.01***	2.68	0.005***	2.66
Location: (1) if urban	0.000	0.02	0.000	0.02	-0.00	0.02
Household size	-0.202**	2.13	0.132**	2.13	0.069**	2.13
Household size - square	0.092**	2.20	-0.060**	2.20	-0.032**	2.19
Age of the household head	0.667	1.63	-0.438	1.63	-0.229	1.63
Age of the household head - square	-0.813**	2.07	0.534**	2.06	0.279**	2.07
(1) if the head of the household is female	-0.034	1.21	0.022	1.23	0.012	1.16
Head's schooling: (1) some schooling	-0.003	0.12	0.002	0.12	0.001	0.12
Head's schooling: (1) high school	-0.025	0.67	0.016	0.67	0.009	0.66
Head's schooling: (1) if college	-0.010	0.19	0.007	0.19	0.003	0.19
Respondent's characteristics						
Are you credit constrained: (1) if yes	**0.139*** **	**8.60**	**-0.095*** **	**8.04**	**-0.044*** **	**8.55**
Gender: (1) if male	0.305***	19.74	-0.193***	18.27	-0.112***	13.54
Age of respondent	-1.511***	3.96	0.992***	3.92	0.519***	3.94
Age of respondent - square	1.787***	4.21	-1.173***	4.17	-0.614***	4.19
Marital status: (1) if respondent is not married	0.091**	2.07	-0.063**	1.99	-0.029**	2.25
Marital status: (1) if respondent is married	-0.061*	1.87	0.041*	1.82	0.02*	1.96
Respondent's schooling: (1) if some schooling	-0.172***	6.10	0.112***	6.41	0.06***	5.56
Respondent's schooling: (1) if high schooling	-0.241***	6.26	0.144***	7.29	0.097***	5.23
Respondent's schooling: (1) if college	-0.285***	5.55	0.14***	9.08	0.145***	3.86

Table 5 (Continued)

	Not a Participant		Participating in 1 arisan only		Participating in more than one arisan	
	Marginal Effects	T-value	Marginal Effects	T-value	Marginal Effects	T-value
Respondent's Religion						
(1) if Islam	-0.220***	3.28	0.162***	3.02	0.058***	4.25
(1) if Protestant	-0.129	1.13	0.076	1.29	0.053	0.96
(1) if Catholic	-0.365***	3.49	0.146***	14.93	0.219**	2.16
(1) if Hindu	-0.047	0.42	0.030	0.44	0.017	0.39
Respondent speaks the commonly spoken language	-0.095***	5.20	0.064***	5.05	0.03***	5.19
Years that respondent has lived in the village	0.001	0.86	-0.000	0.86	-0.000	0.87
Years that respondent has lived in the village - missing	0.048	0.71	-0.033	0.69	-0.015	0.76
Community Characteristics						
A bus-stop is present in the village	0.062***	3.51	-0.042***	3.43	-0.020***	3.56
A market is present in the village	-0.030*	1.73	0.019*	1.74	0.01*	1.7
A public phone is present in the village	0.008	0.38	-0.006	0.38	-0.003	0.38
A post office is present in the village	-0.066***	2.81	0.042***	2.94	0.024***	2.6
A bank is present in the village	-0.021	0.93	0.014	0.94	0.007	0.92
A terminal is present in the village	0.061***	3.49	-0.040***	3.42	-0.021***	3.48
Community credit infrastructure						
Access to a formal financial instititution	0.087	1.17	-0.053	1.28	-0.034	1.03
At least one Credit facility present in the village	-0.064***	3.61	0.042***	3.56		3.64
Access to informal credit associations	-0.023	1.38	0.015	1.37	0.008	1.41
Presence of a money lender in the village	0.003	0.17	-0.002	0.17	-0.001	0.17

Table 5 (Continued)

	Not a Participant		Participating in 1 arisan only		Participating in more than one arisan	
	Test Statistic	P-Value	Test Statistic	P-Value	Test Statistic	P-Value
c2 test statistics for joint significance of						
Residuals	6.59	0.03				
Marriage	23.50	0.00				
Head's schooling	0.92	0.82				
Respondent's schooling	45.63	0.00				
Community Characteristics	38.51	0.00				
Community credit infrastructure	15.65	0.00				
All covariates	871.01	0.00				
Pseudo R-squared	0.139					
Log Likelihood	-4071					

Appendix Table 1: Table of Descriptive Statistics

Variable	Mean	Std Dev
Dependent variable: *Arisan* **participation**	0.296	0.456
Household characteristics		
Real monthly per capita expenditure (in logs)	11.196	0.746
Real monthly per capita expenditure (in logs - square)	125.895	16.862
Average value of assets in 1993 and 1997	15.749	2.030
Location: (1) if urban	0.474	0.499
Household size	0.601	0.263
Household size - square term	0.430	0.453
Age of the head of the household	0.493	0.131
Age of the head of the household - square	0.260	0.136
(1) if head of the household is female	0.139	0.346
Education characteristics of the head of household		
(1) if he has no education	0.163	0.369
(1) if he has primary education	0.529	0.499
(1) if he has high school education	0.257	0.437
(1) if he has college education	0.050	0.219
Respondent, R's characteristics		
Gender of Respondent: (1) if male	0.457	0.498
Age of the Respondent	0.377	0.167
Age of the respondent - square	0.170	0.145
Marital status		
(1) if respondent is not married	0.257	0.437
(1) if respondent is married	0.646	0.478
(1) if respondent is separated, divorced or widowed	0.097	0.296
Respondent's education levels		
(1) if respondent has no education	0.154	0.361
(1) if respondent has at least primary schooling	0.443	0.497
(1) if respondent has gone to high school	0.353	0.478
(1) if respondent has college education	0.049	0.216
Religious affiliation		
(1) if Islam	0.876	0.330
(1) if Protestant	0.045	0.207
(1) if Catholic	0.018	0.134
(1) if Hindu	0.050	0.219
(1) if other	0.011	0.104

Variable	Mean	Std. Dev
Respondent speaks the commonly spoken language of the community	0.729	0.444
Years respondent has lived in the village	21.744	14.419
Years respondent has lived in the village - missing	0.012	0.107
Community characteristics		
A bus-stop is present in the village	0.242	0.428
A market is present in the village	0.374	0.484
A public phone is present in the village	0.433	0.496
A post office is present in the village	0.232	0.422
A bank is present in the village	0.354	0.478
A terminal is present in the village	0.513	0.500
Community credit infrastructure		
People have access to a formal financial institution	0.985	0.122
At least one credit facility present in the village	0.614	0.487
People have access to informal credit associations	0.709	0.454
Presence of a money lender in the village	0.290	0.454
Instruments for LNPCE		
Real monthly per capita expenditure in 1993 (logs)	12.163	1.550
Real monthly per capita expenditure in 1993 (logs - square)	150.333	31.620
No. of rooms in the house	5.259	2.087
Type of roof: (1) if it is made of concrete or wood	0.018	0.134
House is owned by the household	0.845	0.362
Type of Toilet: (1) if a private toilet is present	0.614	0.487
Type of toilet: (1) if shared toilets are present	0.086	0.280
Type of toilet: (1) if there is a lack of proper toilet facilities	0.300	0.458
Type of flooring: (1) if there is a ceramic, tile or cement flooring	0.696	0.460
(1) if proper garbage disposal mechanism exists	0.660	0.474
Type of wall: (1) if it is made of cement or prefabricated bricks	0.601	0.490
Type of sewage disposal: (1) if there is a flowing drainage ditch	0.440	0.496

Appendix Table 2: First Stage OLS Estimates of Log Real Monthly per capita Expenditure (LNPCE) in 1997

	General		Urban		Rural	
	β estimates	T-value	β estimates	T-value	β estimates	T-value
Household Characteristics						
Location: (1) if urban	0.225***	19.57				
Household size	-2.384***	56.96	-2.156***	32.93	-2.547***	46.81
Household size - square	0.667***	28.91	0.556***	14.98	0.733***	25.09
Average value of assets owned in 1993 and 1997 (in logs)	0.041***	15.96	0.029***	10.03	0.053***	12.84
Age of the household head	0.799***	3.58	0.226	0.70	1.136***	3.78
Age of the household head - square	-0.925***	4.33	-0.365	1.17	-1.280***	4.43
(1) if the head of the household is female	-0.088***	6.48	-0.059***	3.19	-0.128***	6.49
Head's schooling: (1) some schooling	0.065***	4.70	0.097***	4.03	0.050***	2.97
Head's schooling: (1) if high school	0.140***	7.84	0.150***	5.35	0.149***	6.19
Head's schooling: (1) if college education	0.289***	10.73	0.315***	8.69	0.269***	5.58
Respondent characteristics						
Gender: (1) if male	0.013	1.53	0.005	0.43	0.019	1.62
Age of respondent	-0.217	1.32	-0.156	0.66	-0.32	1.44
Age of respondent - square	0.232	1.34	0.241	0.95	0.306	1.31
(1) if respondent is not married	-0.022	0.99	-0.063**	1.98	-0.008	0.24
(1) if respondent is married	-0.003	0.21	-0.057**	2.36	0.03	1.30
Schooling: (1) if some schooling	0.039***	2.63	0.04	1.57	0.037**	2.07
Schooling: (1) if high schooling	0.054***	2.92	0.086***	2.96	0.036	1.49
Schooling: (1) if college education	0.159***	5.75	0.200***	5.41	0.081	1.56

Appendix Table 2 (Continued)

	General		Urban		Rural	
	β estimates	T-value	β estimates	T-value	β estimates	T-value
Respondent's Religion						
(1) if Islam	-0.061	1.56	-0.141***	3.21	0.206**	2.53
(1) if Protestant	-0.093**	2.16	-0.192***	3.84	0.141	1.64
(1) if Catholic	-0.259***	5.35	-0.335***	5.95	-0.013	0.14
(1) if Hindu	-0.054	1.24	-0.06	1.08	0.153*	1.79
Respondent speaks the commonly spoken language	-0.086***	8.68	-0.078***	5.10	-0.064***	4.76
Years that respondent has lived in the village	-0.001***	3.73	-0.002***	3.14	-0.001***	2.87
Years that respondent has lived in the village - missing	-0.082**	2.14	-0.089*	1.82	-0.096	1.62
Community Characteristics						
A bus-stop is present in the village	-0.005	0.45	-0.005	0.39	-0.007	0.38
A market is present in the village	-0.058***	6.12	-0.014	1.02	-0.091***	6.73
A public phone is present in the village	0.040***	3.34	0.058***	3.75	-0.048**	2.44
A post office is present in the village	-0.137***	10.83	-0.098***	6.59	-0.244***	9.78
A bank is present in the village	0.068***	5.37	0.045***	2.74	0.095***	4.53
A terminal is present in the village	0.076***	8.06	0.044***	3.09	0.121***	9.23
Community Credit Infrastructure						
People have access to a formal financial instititution	0.143***	4.17	0.461***	5.07	0.061	1.59
At least one Credit facility present in the village	-0.002	0.20	-0.049***	3.13	0.047***	3.83
People have access to informal credit associations?	-0.008	0.84	-0.033**	2.38	0.024*	1.95
Presence of a money lender in the village	0.025***	2.78	0.026**	2.05	0.022*	1.67

Appendix Table 2 (Continued)

	General		Urban		Rural	
	β estimates	T-value	β estimates	T-value	β estimates	T-value
Instruments						
Log real monthly per capita expenditure (LNPCE) in 1993	-0.416***	24.93	-0.550***	21.08	-0.316***	14.33
No. of rooms in the dwelling	0.047***	19.58	0.036***	11.84	0.054***	13.99
Type of roof: (1) if concrete or wood	0.269***	9.01	0.211***	5.41	0.351***	7.77
Household owns the house that they live in	-0.064***	5.06				
Type of toilet: (1) if shared toilets present	0.050***	3.17	0.016	0.66	0.101***	4.77
Type of toilet: (1) if private toilet present	0.006	0.61	0.075***	4.23	0.031***	2.39
Household uses electricity	-0.042***	3.15	0.079**	2.22	-0.084***	5.74
A proper garbage disposal mechanism exists	0.059***	6.58				
LNPCE 1993 - squared	0.024***	27.91	0.030***	23.45	0.018***	15.93
Type of stove used for cooking: (1) if electric or gas.	0.191***	12.66	0.236***	13.59	0.005	0.14
Type of wall: (1) if masonry	0.098***	10.14	0.037**	2.52	0.120***	9.27
(1) if the household owns a television	0.177***	17.35	0.091***	5.53	0.214***	16.58
(1) Type of sewage facilities			0.126***	9.90	0.104***	8.08
c^2 test statistics for joint significance of						
Instruments	288.15	0.00	191.99	0.00	149.23	0.00
All covariates	382.97	0.00	168.18	0.00	162.09	0.00
R-squared	0.50		0.47		0.43	
No. of Observations	18132		8596		9536	

Appendix Table 3: Determinants of the probability of participating in an *arisan*, segregated by location (IV Estimates)

	Urban		Rural	
	Marginal Effects	T-values	Marginal Effects	T-values
Household Characteristics				
Predicted LNPCE	1.163***	2.61	0.805**	2.10
Predicted LNPCE - square	-0.049**	2.55	-0.028	1.61
Average value of assets owned in 1993 and 1997 (in logs)	0.011***	3.38	0.004	0.97
Household size	-0.005	0.07	0.350***	4.41
Household size - square	0.001	0.03	-0.166***	3.39
Age of the household head	-0.455	1.45	-0.550**	2.30
Age of the household head - square	0.492	1.63	0.568**	2.43
(1) if the head of the household is female	0.010	0.55	0.049***	2.92
Head's schooling: (1) some schooling	0.010	0.42	-0.013	0.93
Head's schooling: (1) if high school	0.060**	2.08	-0.032*	1.69
Head's schooling: (1) if college education	0.059	1.54	0.096**	2.34
Respondent's characteristics				
Gender: (1) if male	-0.272***	23.98	-0.175***	19.24
Age of respondent	1.677***	7.05	1.053***	5.48
Age of respondent - square	-2.012***	7.72	-1.463***	6.84
Marital Status				
(1) if respondent is not married	-0.111***	3.79	-0.033	1.34
(1) if respondent is married	0.098***	4.26	0.087***	4.88
Respondent's schooling				
(1) if some schooling	0.141***	5.57	0.059***	4.10
(1) if high schooling	0.185***	6.52	0.101***	4.90
(1) if college education	0.212***	5.40	0.075*	1.76
Religion: (1) if Islam	0.340***	7.72	-0.058	0.91
Religion: (1) if Protestant	0.374***	5.25	-0.130***	2.60
Religion: (1) if Catholic	0.492***	6.93	0.045	0.60
Religion: (1) if Hindu	0.341***	4.48	-0.164***	3.68
Respondent speaks the commonly spoken language	0.034**	2.31	0.111***	10.80
Years that respondent has lived in the village	0.001**	2.12	0.001**	1.98

	Urban		Rural	
	Marginal Effects	T-values	Marginal Effects	T-values
Community Characteristics				
A bus-stop is present in the village	-0.048***	3.68	-0.046***	3.42
A market is present in the village	0.003	0.26	0.030***	2.82
A public phone is present in the village	0.029*	1.93	0.027*	1.77
A post office is present in the village	0.035**	2.46	0.071***	3.33
A bank is present in the village	0.038**	2.41	0.004	0.25
A terminal is present in the village	0.009	0.62	-0.081***	8.02
Community Credit Infrastucture				
Access to a formal financial instituition	0.157*	1.70	-0.030	0.88
At least one Credit facility present in the village	0.064***	4.28	0.055***	5.79
Access to informal credit associations	-0.011	0.86	0.028***	2.97
Presence of a money lender in the village	0.060***	4.89	0.002	0.23
Residuals from the 1st stage	-0.133**	8.43	-0.161***	7.51
Residual from the 1st stage (square)	0.014	0.88	0.004	0.31
c2 test statistics for joint significance of				
Residuals from the 1st stage (exogeniety test)	48.34	0.00	56.53	0.00
Marriage	117.30	0.00	72.84	0.00
Head's schooling	10.39	0.00	14.35	0.00
Respondent's schooling	42.90	0.00	24.74	0.00
Community Characteristics	39.43	0.00	94.04	0.00
Community credit infrastructure	50.73	0.00	43.58	0.00
All covariates	1642.42	0.00	1590.57	0.00
Pseudo R-squared	0.146		0.152	
Log Likelihood	-4797		-4434	
Observations	8596		9536	