

# Better Together – or not?

## Community Participation, Consumption Smoothing and Household Head Employment in Indonesia\*

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**ABSTRACT**

This paper analyzes whether participation in formal and informal community activities helped household in Indonesia mitigating the impact of the 1998 economic crisis and increasing the probability of household head being employed. The paper uses the 1997 and 2000 round of Indonesian Family Life Survey (IFLS) to capture the impact of economic crisis on household welfare. The empirical results do not seem to support those hypotheses. Using number of children in each household as instrumental variable to solve the reverse causality and omitted variable bias problems, we find no statistically significant effect of community participation on the ability of households to mitigate expenditure shocks and to smooth consumption. The large magnitude and universal nature of the shock might explain why social capital did not help households. Participation in community activities also does not seem to significantly explain the probability of household heads being employed in the period of the crisis.

**Keywords:** Social capital, household welfare, economic crisis, community participation, arisan, Indonesia

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## Introduction

This paper analyzes the effect that friendship and social links had on allowing families to smooth their levels of consumption and the probability of getting a job during the Indonesian financial crises in 1998. We test whether formal or informal social participation as a measure of social capital investment increases the possibility of families to insure their consumption when adverse external shocks occur. Similarly, we test whether social capital increases the probability of being employed at any moment.

We use data from the Indonesian Family Life Survey (IFLS), and in particular, from the second and third waves done in 1997 and in 2000, respectively. Furthermore, we use the household as the unit of analysis. Therefore, we focus on the possibility of intra household transfers as the main risk sharing insurance procedure.

The study is divided in two main parts. One part of the study intends to measure the effect of social participation in household consumption smoothing.<sup>1</sup> In order to do that, we follow a similar strategy as the one used by Townsend (1994) in which we consider that household expenditure is a function of household income, the rest of the village's level of consumption and other controls. If perfect risk sharing were the case, then household expenditure should only depend on the general level of consumption (expenditure) of the village and not on the household's income. We control then for household village activities participation to see if more participation as a proxy of higher social capital allows for household consumption smoothing. Nevertheless, we considered that there could be a problem of reverse causality. Therefore, we used instrumental variable estimation to solve this potential problem.

As part of our results, we actually found that households share risk and are able to smooth their consumption, although not perfectly. Unfortunately, we did not find any significant difference in getting access to consumption smoothing mechanisms between those who are involved in at least one community activity and those who do not. In other words, participation did not really help households smoothing their consumption.

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<sup>1</sup> We use household expenditure as a proxy of household consumption.

Another part of the study analyses if participating in formal or informal community activities increases the probability of being employed in a four-year period of time. We define formal participation as those that have clear organization or hierarchy like village government, village council (LKMD), neighborhood association (RT/RW), cooperatives or women's association (PKK). Conversely, we considered informal activities participation the membership of informal rotating credit groups called *arisan* in Indonesia. We consider this type of activity as "informal" not because credit groups are not regulated in some sense, but because we are only interested in the bonding that results from the time spent and the regularity of the gatherings.

However, when we estimated the empirical effect of social participation on the probability of getting a job neither the coefficient on participation in formal activities, nor the coefficient on participation in informal activities is statistically significant. When we use overall participation instead of participation in formal and informal activities, the estimated coefficient is not significant and close to zero as well.

The study is structured in the following way. Section 2 presents a brief literature review while section 3 contains a description of the data we use as well as the description of the variables we use. Section 4 includes the empirical strategy used. Section 5 presents the main results of the study and section 6 finishes with some concluding remarks.

## **Literature review**

The relationship between the closeness of interpersonal links and the possibility to use them as informal insurance schemes to solve temporary income shocks has drawn the attention of many researchers. Similarly, the importance of networks on labor participation has also been in the center of researcher's attention. A vast array of studies has been written on the matter. In the following pages we summarize the findings of some that are related to our findings.

Even though risk is inevitable and has important consequences on individuals' consumption levels, people will try to look for ways to smooth their consumption streams in order to maintain a constant level of well being. Darryl Collins (2004) summarizes

consumption smoothing activities using Friedman's permanent income hypothesis. Friedman's theory basically argues that rational individuals will try to smooth consumption if income is disrupted. Therefore, transitory income shocks have no effect on consumption, but permanent income shocks will translate into changes in consumption. This theory works in developed countries due to the existence of mechanisms like insurance and credit. However, "in low income countries existing mechanisms do not work well, and households are forced to cope following a shock by drawing down savings, selling assets, borrowing and saving, working longer hours, doing without key services such as health and education or without key goods such as certain foods." Therefore, other types of mechanisms have been developed to attain the aforementioned goals.

There is a broad variety of informal mechanisms aiming to provide consumption smoothing. The literature considers that individuals either follow ex-ante income or consumption smoothing preemptive actions or ex-post actions to maintain a constant level of consumption.<sup>2</sup> Examples of *ex-ante preemptive actions for income smoothing* are different types of labor contracts (sharecropping, tenancy and fixed wages), crop and plot diversification and occupation diversification (members of the family working in other places). Conversely, savings, insurance and social networks arrangements such as migration and marital status are examples of *ex-ante actions for consumption smoothing*. Finally, examples of *ex-post consumption smoothing actions* can take the form of borrowing, assets sales, transfers (governmental subsidies, gifts or remittances) and labor supply. We will concentrate in the last type throughout this paper.

Townsend (1995) argues that if individuals are risk averse and shocks are idiosyncratic, then local insurance or pooling may be feasible.<sup>3</sup> Whence risks are unevenly distributed, risk averse individuals group together to share risks. For example, in rural settings individual's agricultural income depends on weather fluctuations such as rain, temperature, humidity, as well as the quality of fertilizer, crop disease, personal illness, political situation, trade policy, and many other factors. Even when every

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<sup>2</sup> There is not much someone can do about his income stream once the catastrophe occurred. However, they can still smooth consumption by receiving transfers through safety nets ex-post.

<sup>3</sup> However, if shocks are aggregate, then insurance is more limited implying substantial gains from public or government action. For further reference see Townsend (1995:83).

individual in the community is affected by the same weather shocks, risk may well vary from individual to individual within the community.

Therefore, according to Townsend (1994, 1995) individuals will have an incentive to group together to help each other by transferring a part of their income in case of a catastrophe occurs to a group member. If “full insurance” exists, individual household consumption should depend exclusively on movements in the group’s consumption and not on movements in the individual’s income. Using data from India, Thailand and Cote d’Ivoire, Townsend (1994, 1995) found that individual family consumption is both affected by individual household income and by group or village level consumption, suggesting the existence of some degree of informal (although not perfect) group insurance.

Similarly, Rao (2001) researches the reason behind large spending in public celebrations in rural India. He argues that households that spend money on festivals are able to generate tangible rewards such as higher social status and meal invitation from other families. That is, “participation in festivals generates private economic and social returns that help resolve a potential free rider problem, serving as a mechanism by which communities build social networks”. Moreover, festivals serve to build social cohesion by reinforcing ties within a community, and also help solve coordination problems by generating common knowledge and playing an important role in communicating information. By participating in festivals, a family signals its commitment to being an active member of the community and a potential partner in mutually reciprocal relationships. Therefore, at the village level, festivals enhance social cohesion and build social capital, while at the family level, they provide households with opportunity to access social networks and generate returns from investments in social capital.

We consider that this type of behavior is both based and enhanced by local networks and social capital. Coleman (1988) argues that like other type of capital, social capital “is productive, making possible the achievement of certain ends that in its absence would not be possible”, and “like physical and human capital, social capital might not be fungible, but it is specific for certain activities”. Furthermore, we believe that the closer the links between individuals in a group or the denser the network, the higher the amount

of risk sharing within the group. As Coleman suggests, close community relations enhance the use and success of risk sharing mechanisms.

For example, Philips and Massey (2000) presents an interesting study in which social capital among Mexican migrants to the US helps increase sources of consumption smoothing. He argues that social capital “emanates from interpersonal ties that acquire instrumental value for Mexicans seeking to enter the United States and find a job”. His main argument is that people who have already been to the United States are in a position to help friends and family members to travel, cross the border and find a job through the provision of information, contacts and material assistance. Social capital arises from the linkages between people that have already migrated and those who are seeking to do it. According to the authors, “after more than 50 years of continuous development, this process of social capital formation is well advanced, largely self sustaining and broadly diffused across Mexico”.

Similarly, Munshi (2003) analyzes the job networks of Mexican immigrants in the US labor market. He uses data of Mexicans coming from multiple communities, and measures the communities’ networks as the relative size of immigrants groups on the total population. Using rainfall in the origin community as an instrument, he actually finds that the same individual is more likely to be employed and get a higher wage where the relative size of the immigrant community is exogenously larger in the destined population. Therefore, networks and social capital work for immigrants.

Furthermore, other studies have examined both the determinants and the impacts of social capital and participation using household level data in Indonesia. Beard (2005) estimates the determinants of civic participation in Indonesia using the IFLS-2, the first of the two datasets used in this study. Using logistic regressions, Beard finds that being head of household, spouse of a household head, having children under 5 (for women), being employed, literacy (for women), participating in a number of activities in the community, living on Java, living in a rural area and being in the wealthiest quarter of the population are significant positive determinants of participation. This list includes some intuitive determinants of participation such as wealth and education level as well as some less obvious factors such as having young children. Beard concludes that since the well-

educated, the better-off, and the men are the most likely to participate, participatory institutions reinforce inequalities and have a limited capacity to help the poor. Nevertheless, even when the poor may be less likely to participate, those who do it may still benefit from that participation and the social ties generated.

Similar to Beard, Varadharajan (2004) inquires participation in rotating savings and credit associations (*arisans*) using the 1997 IFLS. The data shows that 51 percent of the households and 28 percent of all adults participate in at least one *arisan*. The participation rate of women is higher and the predominant type of *arisan* is at the sub-neighborhood and neighborhood level. Varadharajan explores if credit constraints lead to participation in *arisans*. She suggests that there should be other reasons other than just credit since she finds a positive relationship between the existence of credit infrastructure and participation in *arisans*. Furthermore, the results indicate that credit constrained individuals are less likely to join an *arisan*. In this context, we posit that participation in *arisans* is a type of investment in social capital. Arisans give space to build ties to other members in the community that can provide access to information (e.g about job opportunities) and other resources.

On the other hand, Wetterberg (2005) investigates the way in which different types of social ties affected welfare across the 1998 financial crisis (using data from 1996 and 2000). Using OLS and logistic regressions Wetterberg estimated the effect of these ties on 2000 real expenditure and the likelihood of receiving aid respectively. Controlling for gender of household head, education of household head, whether the household works in agriculture, and their original welfare level, Wetterberg finds some significant effects of social ties on both 2000 expenditure and the likelihood of receiving community and government help.

Finally, Jacob (2005) examines the role of social capital in improving household welfare by providing possibilities of consumption smoothing and consumption increase in Indonesia using also the three rounds of the IFLS. He investigates the role of social capital in improving household welfare and providing insurance against adverse events and increasing the level of consumption. Following a household production model approach, he treats social capital as one of the different forms of capital available to the

household. He finds that households that increase their stock of social capital over time are 33 percent more able to smooth their consumption against various economic shocks. Moreover, he finds that some types of social capital such as within family transfers and participation in various community activities and credit groups allowed families to smooth consumption more easily, independently of the type of shock. Conversely, some types of shock made it more difficult for households to smooth consumption, such as employment shocks.

## Data

We use the Indonesian Family Life Survey (IFLS). IFLS is a comprehensive longitudinal household survey conducted in three waves: IFLS-1 (1993), IFLS-2 (1997) and IFLS-3 (2000). This survey is representative at the national level. The IFLS was conducted in 13 of the 27 Indonesian provinces that existed before 2001<sup>4</sup>, where approximately 83 percent of the Indonesian population lives. The IFLS sampling was stratified at the province level, and clustered within these strata.<sup>5</sup>

The first wave of IFLS includes around 7,200 households and 22,000 individuals. In the latter waves (IFLS-2 and IFLS-3), the sample size has been expanded to more than 10,000 households and around 39,000 individuals.<sup>6</sup> The re-interview rate of IFLS is considerably high. On average, 95 percent of the sample was re-interviewed in the following wave. In total, 91 percent of respondents from the first wave completed all three waves.

For the present paper, we are using the second and third waves of IFLS. The timing enables us to capture the pre and post-crisis situation. The second wave was completed in 1997, just before the beginning of the 1998 economic crisis. The third wave

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<sup>4</sup> After 2001, some provinces were split so the number of provinces becomes 32 in 2005. Two of the IFLS provinces have also experienced the split: Banten split from West Java, and Bangka-Belitung from South Sumatra.

<sup>5</sup> For further description of IFLS, See Strauss, Beegle, Sikoki, Dwiyanto, Herawati and Witoelar (2004) and Frankenberg, E. and D. Thomas (2000).

<sup>6</sup> An extra wave was conducted in 1998 with a small set of samples – 25 percent of that in 1997 – were re-interviewed to capture the immediate impact of the economic crisis. This wave is sometimes called the IFLS-2+.

captures the situation in 2000, after the peak of the crisis had passed. In Table 1 we can see that wealthier people experienced a greater shock from the crisis and, as of 2000, had recovered more slowly than the poorer quintiles of the population.

### **Dependent variables**

We would like to test the effect of participation on two dependent variables. The first is change in annual total household expenditure from 1997 to 2000. The second is the probability of being employed in the period 1997-2000.

#### *Household expenditure*

The 2000 household expenditure is adjusted for the inflation that occurred over those two years, so that we are measuring the change in consistent 1997 Rupiah. We are using household, not individual, as the unit of analysis because the data on individual expenditure is not available. Nevertheless, apart from this reason, the strong communality in Indonesia makes it more relevant to view households as the main unit of decision-making. In the Indonesian context, people share their resources within family, and in the absence of formal safety net, family and kinship provide informal protection for members. Furthermore, we are interested in testing the expenditure response to social ties whose externalities vest at the household level. Any advantage from social capital gained by one member will be translated into higher welfare of all household members. Looking at changes in expenditure on the individual level captures intra-household dynamics conflating the effects of participation and social capital.<sup>7</sup>

#### *Probability of having a job*

We use the indication whether the head of the household is employed in each year to calculate the probability that the household head had a job over the period 1997-2000. We focus only on household heads because they in general are more attached to the labor market, hence more likely to be willing to participate in the labor market. By selecting only the heads of household as observation, the probability of including those who left

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<sup>7</sup> We are aware of the weaknesses of using expenditure. Changes in household expenditure may be due to changes in household size, because of birth, death, households splitting off or merging. To solve the problem, we include the variable changes in household size as one of the controls.

the labor market voluntarily were reduced. Moreover, we only include household heads who were 30 years old or above in 2000. The reason is most of our samples have completed their education so we exclude those who did not work due to studying.

We will test if higher participation of all the adult household members means that the household head can remain employed during the whole period. If social networks established through participation in formal and informal activities are effective in providing contacts and information to finding job more quickly, it will be more likely for the household head to remain employed in the period of analysis. We use the information of the household head only, assuming that household heads are the main support of the household economy and that the household head can have access to the resources of the networks of all the household members.

### **Independent variable: participation**

We basically analyze two types of participation: whether it is formal or informal activities. Formal activities are those that have clear organization or hierarchy like village government, village council (LKMD), neighborhood association (RT/RW), cooperatives or women's association (PKK). Some activities like neighborhood security watch (Siskamling), voluntary labor (*gotong-royong*) or collective garbage disposal do not have clear organization but usually involve a leader for administration, so they are also considered as formal activities. Government organized community health and immunization program (Posyandu) are included in formal activities as well.

As the proxy for informal participation, we use the information on *arisan*. *Arisan* is a common type of social gathering in Indonesia. It is basically a rolling credit scheme.<sup>8</sup> Our interest in *arisan* is not in how it distributes money, but rather on how it brings people together regularly, developing and strengthening their social capital and networks. Our approach is similar to a study by Matakos, Perdana and Radin (2006). However, we add two other measures of participation: time spent for formal participation in the past 12

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<sup>8</sup> A group of people – neighbors, big family, office colleagues and so on – pool a certain amount of money every meeting. Then they decide by lottery who wins the pooled money. The next time they meet, usually once every month, they do the same thing. The winner in previous meeting must participate in subsequent meetings, but he or she will not be eligible for the money. The rotation continues until everyone in the group has ever taken the pot of the money, before starting from the beginning.

months and money contributed for *arisan*. Both variables are added to capture the intensity of the network.

Admittedly these variables have several weaknesses. They ignore the differences between old and new ties, as well as the size and intensity of the networks from participation. Information on the number of people participating in the *arisan* group or community activities is not available in the 1997 wave of IFLS. While the information regarding frequency of participation is available in the IFLS, we have some doubts about the accuracy of answers, which would create serious measurement errors. Therefore, we decided not to use this additional variable.

### **Explanatory variables: other controls**

There are some controls introduced in the estimation. To test the consumption-smoothing hypothesis, we introduce changes in household income changes in community-level aggregate income as additional dependent variables. We also add the interaction term of changes in income and dummy for any participation to estimate whether participation in the community activities has any impact in the ability of households to smooth income.

According to Townsend (1994) when risks are unevenly distributed, risk averse individuals group together to share risks. In this case, consumption smoothing or group informal insurance will be present because individuals will have an incentive to group together to help each other by transferring a part of their income in case of a catastrophe occurs to a group member.

In order to estimate the effects of social capital, we controlled for physical and human capital with the variables natural log of household assets in 1997 and dummies for female-headed households and education levels respectively. In order to make the changes in expenditure levels comparable across households, we also controlled for urban-rural areas and provincial fixed effects. In the case of the probability of being employed, we also use the age and age squared of the household head.

Finally, we add changes in household size due to birth, death or migration as one of the controls. Changes in household size will obviously affect total household expenditure without affecting the members' welfare.<sup>9</sup>

## Estimation strategy

### Participation and consumption smoothing

Our first model is based on the following hypothesis:

Hypothesis 1: The social ties generated through participation provide informal insurance or risk sharing. Thus we expected people with higher social capital to experience lower expenditure shocks, and a higher ability to smooth consumption.

To test the above hypothesis, we estimate:

$$(1) \quad \Delta HHEXP = \beta_0 + \beta_1 PARTIC97 + \beta_2 \Delta HHINC + \beta_3 \Delta COMMINC + \beta_4 ANYPARTIC * \Delta INC + \gamma_1 X_i + \varepsilon_i$$

The dependent variable is measured in log differentials, so it should be interpreted as percent changes of household expenditure between 1997 and 2000. Change in household income is introduced to test whether households were able to smooth their consumption. This variable is also measured in log differentials.

The standard OLS estimation for (1) suffers from the reverse causality and Omitted Variable Bias (OVB) problem. Based on what Beard (2005) found in her study, wealthier people are more likely to participate. This creates a problem of reverse causality in that people may participate more because their welfare is increasing rather than the other way around. Intuitively we also expect that several factors would be correlated with both welfare (expenditure) and participation, for example sociality,

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<sup>9</sup> Some households reported big changes in their size. This is due to families being split-up (members get married and forming new households), as well as merged (some households in urban areas or other crisis-hit regions moved in to their relatives in different places, and merged into one household). To avoid bias, we omitted some observations that reported changes in more than five household members.

entrepreneurialism and popularity. To solve these problems, we will use instrumental variables technique for participation.

To find an appropriate instrument, a factor that would predict participation but would not be a determinant of changes in household expenditure (other than through participation) we refer back to the determinants of participation identified in Beard's paper. Beard found that having a child under 5 predicted a significant increase in a woman's participation. The rationale she offered for this was that women needed more assistance in terms of childcare and health care when they had young children and thus they participated more. Intuitively we expected that the number of children under 5 would not be correlated with changes in expenditure specifically or with welfare in general, after controlling for the change in the number of household members. The first stage of our 2SLS regression (presented in the following section) confirmed this expectation.

While Beard did not find that having children between age 6 and 10 predicts participation, our first stage least squared regression (again presented in the following section) demonstrated a significant negative correlation. Hypotheses about this relationship include that many of the social services accessed through participatory organizations in Indonesia focus on children under five, thus decreasing the motivation of mothers of 6-10 year olds to participate. Additionally, at age 6 children in Indonesia are required to start school, which provides childcare and possibly other social services that mothers may have previously sought elsewhere. Finally, mothers may pursue more extensive employment once their children are in school limiting the time they have available to participate.

### **Probability of being employed**

We base our second model on this hypothesis:

Hypothesis 2: The network created through the participation of household members in formal and informal activities serves the household head to increase the chances of preserving his job in a period of crisis.

The estimation to test the above hypothesis would be:

$$(2) \quad \text{Prob of being employed} = \beta_0 + \beta_1 \text{PARTIC97} + \alpha_i Z_i + v_i$$

There is a variety of literature that addresses the role of social networks in labor markets. Networks are a useful means to access information about job opportunities.<sup>10</sup> In this regard, Montgomery (1991) notes that approximately fifty percent of all workers at a point of time found their jobs through friends or relatives.<sup>11</sup> Moreover, as Aguilera (2002) states, some studies suggest that “friends and relatives sort through jobs to reserve the better jobs for people within their network.” Furthermore, Granovetter (1974, cited in Aguilera 2002) emphasizes that the breath of the network, i.e. if it includes people that are in other places or people that belong to different social groups, increases the amount of information that one member of the network can get. Therefore, the higher the number of activities that the household members participate in, the broader is the network that the household head can access to get a job.

We are aware that the results will not provide evidence about the impact of participation on the probability of being employed since reverse causality is patent. Higher probability of employment may imply greater financial stability and resources for the family, rendering more capacity to participate in formal and informal activities. First, if other members of the household do not need to work, they can spend more time in community participation. In the case of *arisan*, although the findings of Varadharajan suggest that there must be other non-credit motives for participation in *arisan*, a certain minimum monetary contribution is required to participate. If the household head maintained his job for a larger period, it is more likely that he or the other members of the household would have the resources to participate in an *arisan*. Unfortunately we were not able to find an appropriate instrument for participation, since most variables are directly related to the work participation decision. Therefore, we limit us to provide estimates of the association between the probability of having job and community participation.

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<sup>10</sup> Refer to Calvo-Armengol and Jackson (2003) for a model on transmission of job related information.

<sup>11</sup> For a summary of the results of different studies in the U.S. refer to Montgomery (1991:1409).

## **Empirical results**

### **Effects of participation on changes in expenditure and consumption smoothing**

#### *Ordinary Least Square*

As discussed in the previous sections of this paper we suspect that the OLS results will suffer from reverse causality and OVB problems that will undermine the internal validity of our estimates. Nevertheless we present the OLS estimates on the predicted effect of participation on changes in household expenditures and consumption smoothing as a reference case. We do separate estimations using different measures of participation. We use only one measure at one regression – not simultaneously – because later we will do instrumental variable regressions for each measure.

In Table 3, we can see that an increase in participation (both formal and informal) is associated with a decrease in household expenditures that ranges from 1-2.7 percent, while the impact of an additional hour spent for formal participation, although statistically significant, is negligible. We expect this result given the endogeneity between welfare and participation. We know that the wealthier quintiles of society were more likely to participate and we also know that they were the most adversely affected by this crisis. Thus we would expect to find a negative correlation between participation and change in expenditure when we do not control for reverse causality and OVB. Hence we decided to reproduce these estimates introducing these time our two instrumental variables and see whether these results will verify our assumptions.

Based on the OLS results, we also found that the change in household expenditure is positively correlated with change in household income. The coefficients are statistically significant at the one percent level for all regressions, but the correlation is relatively small; a ten percent decrease in income is only associated with 1.0-1.1 percent decrease in expenditure. On the other hand, household expenditure change is also positively correlated with change in community-level total expenditure. In all four regressions, we found that for every ten percent increase in community expenditure, household expenditure increased by around 4.5 percent.

These two findings suggest two things. First, the small coefficients for change in household income means that household smooth their consumption, although not perfectly. Second, there is a significant degree of risk sharing among household living in the same community, although again the risk sharing mechanism is not perfect. Given these two conditions, we can imply that households smooth their consumption partly through sharing risk with their neighbors in the community.

However, looking at the interaction term of participation and changes in household income, we do not find the coefficients to be statistically significant. This implies that there is no difference in getting access to consumption smoothing mechanisms between those who are involved in at least any activities and those who do not. In other words, participation did not really help households in smooth their consumption. Households may rely more on other social connections, such as kinship, rather than networks established through community participation.

The dummy for female-headed households and urban areas do not turn to be statistically significant. Most likely this was due to the introduction of household assets as another control, and both female headed households and urban dummies are correlated with household assets.

#### *Two-staged Least Square*

The first stage of the 2SLS regressions (Table 4) confirms the validity of our instruments. They proved to be a statistically significant determinant of participation (formal, informal and total) at the 1 percent level. The value of F-statistics is also considerably high. We also found that the correlation between the instruments and the dependent variable were minimal and not statistically significant. Hence, we can conclude that the number of children under the age of five and children aged 6-10 is a good instrument for participation.

In the second stage (IV) regression, the coefficients for different measures of participation in general became more negative. This finding actually contradicts our hypothesis because it shows that instead of negative bias, OLS regression in fact suffered from positive bias. However, the IV also corrected the standard errors, so in the end all

coefficients of participation become not statistically significant. Therefore, at best we can only conclude that there is no evidence that that participation would increase households' capacity to mitigate crisis.

One possible explanation is that because this shock was 1) covariate, in that it affected everyone to some extent, 2) too large so even if social capital could help, the magnitude of the shock was beyond what it could mitigate, and 3) most heavily felt by the wealthier (potential donor) members of society, social capital did not mitigate the experience of individual households. This is intuitive in that, in order for trust or social ties to facilitate consumption smoothing, someone has to be capable of giving or lending resources to others in need. This is not to suggest that social capital is unimportant for development in general. It rather stresses the limitations of its applicability as a consumption smoothing and shock mitigating mechanisms.

### **Effects of participation on probability of being employed**

Table 7 shows the estimates of the coefficient on participation of the probability of being employed. Specifications (1) to (5) use the number of activities all the members of the household are engaged in as explanatory variables. Neither the coefficient on participation in formal activities, nor the coefficient on participation in informal activities is statistically significant. The estimates of the coefficients are close to zero and have similar values for specifications (1) to (4). When we use overall participation instead of participation in formal and informal activities (6), the estimated coefficient is not significant and close to zero as well. Male household heads had a greater probability of employment in the aftermath of economic crisis. The relationship of age is mountain-shaped meaning that the probability increases until certain age and then declines. Given that the crisis had a greater incidence in urban areas and on more educated workers, the probability of being employed is lower in urban areas and having secondary and college studies is associated with a lower probability of being employed.

Regressions (7) to (10) measure the association between participation in any formal and informal activity and the probability of having employment. The findings related to the gender of the household head, age, education and urban location are similar to the results of regressions (1) to (5). Nonetheless, the coefficient on participation in any

informal activity turns statistically significant at the 10 percent level for the specification (8) that includes individual controls. When we include province and religion dummies, the coefficient on informal participation becomes non-significant, but the p-value is still lower than 0.2. The coefficient is positive suggesting that more participation in *arisan* is associated with higher probability of being employed. However, the reverse causality issue prevents us to claim that informal participation has a positive impact on the probability of having employment. Furthermore, the magnitude of the coefficient is small. On average each household participates in two *arisans*, according to the estimates this contributes only in 1.6 percentage points to the average probability of being employed (96.3 percent). The results are similar if we run separate regressions for urban and rural areas (not showed).

If we control for the money contributed to the activities, the coefficient on *arisan* participation loses further significance and decreases slightly, but the amount of money contributed turns significant (see regressions 6 & 11 in Table 7). This suggests that the effect we captured in other regressions may derive from the positive association of higher resources – due to higher probability of remaining employed – and community participation.

## **Concluding Remarks**

The findings presented in this paper not only depict the impacts of participation and social capital in Indonesia, but also reinforce the importance of rigorously testing predictions regarding their effects in general. We use the longitudinal household survey data to see the impact of participation on household welfare in the national level. Using number of children aged below 5 and 6-10 as instrumental variables, we tried to correct the potential bias created by reverse causality and omitted variables. Our results showed that at best, participation did not help households mitigating shocks because of the 1998 economic crisis. This was because community participation had a limited capacity to assuage overall changes in household expenditure during the economic crisis.

Regarding the effect of participation on the probability of being employed, unfortunately we have not been able to isolate the pure effect of the network on

remaining employed during the economic crisis. It seems that the effect has the contrary direction, higher level of employment leads to participation of household members in community activities. Furthermore, the lack of information regarding the individual characteristics of the participants in the activities limits our analysis. ■

## References

- Aguilera, Michael B. (2002). "The Impact of Social Capital on Labor Force Participation: Evidence from the 2000 Social Capital Benchmark Survey". *Social Science Quarterly* 83(3):853-874.
- Athanasoulis, Stefano G. and Robert J. Shiller (2001). "World Income Components: Measuring and Exploiting Risk-Sharing Opportunities", *The American Economic Review* 91(4):1031-1054.
- Beard, Victoria (2005). "Individual Determinants of Participation in Community Development in Indonesia." *Environment and Planning C: Government and Policy* (23): 21-39.
- Begazo-Gomez, Tania, Jacqueline Bueso, Alex Culiuc and Alan Fuchs (2006). "What are comrades for? Ethnic minorities and consumption smoothing in Russia" Unpublished term paper, Kennedy School of Government, Harvard University, May 2006.
- Calvo-Armengol and Matthew Jackson (2003). "The Effects of Social Networks on Employment and Inequality". *American Economic Review* 94(3):426-450.
- Coleman, James S. (1988). "Social Capital in the creation of Human Capital". *The American Journal of Sociology*. 94: 95-120.
- Frankenberg, E. and D. Thomas (2000). "The Indonesia Family Life Survey (IFLS): Study Design and Results from Waves 1 and 2". March 2000. DRU-2238/1-NIA/NICHD.
- Jacob, Jeffrey A. (2006) "The role of social capital in consumption smoothing and self insurance, evidence from Indonesia" Southern Methodist University, Job Market Paper.
- Matakos, Kostas, Ari Perdana and Elizabeth Radin (2006). "Dragon Boating Alone: Did Social Capital Help Indonesian Households during Economics Crisis?" Unpublished term paper, Kennedy School of Government, Harvard University, May 2006.
- Montgomery, James D. (1991). "Social Networks and Labor-Market Outcomes: Toward an Economic Analysis". *American Economic Review* 81(5):1408-1448.
- Morduch, Jonathan (1995). "Income Smoothing and Consumption Smoothing," *Journal of Economic Perspectives*. 9(3):103-14, Summer 1995.
- Munshi, Kaivan (2003). "Networks in the Modern Economy: Mexican Migrants in the US Labor Market", *The Quarterly Journal of Economics* pp. 549-599.
- Perdana, Ari and John Maxwell (2004). "Poverty Targeting in Indonesia: Programs, Problems and Lessons Learned." CSIS Working Paper No. WPE 083, March 2004.
- Philips, Julie A. and Douglas Massey(2000). "Stocks of Human and Social Capital in Mexico". *Social Science Quarterly* 81(1):33-48.
- Pritchett, Lant and Michael Woolcock (2004). "Solutions when *The Solution* is the Problem: Arraying the Disarray in Development" *World Development* 32(2): 191-212.
- Putnam, Robert D. (1966). "Political Attitudes and the Local Community". *The American Political Science Review* 60(3): 640-654.

- Rao, Vijayendra (2001). "Celebrations as Social Investments: Festival Expenditures, Unit Price Variation and Social Status in Rural India", The Journal of Development Studies 38(1):71-97. October 2001.
- (2001). "Poverty and Public Celebrations in Rural India", The Annals of the American Academy 573:85-103, January 2001.
- Sen, Amartya (1999). *Development as Freedom*. New York: Norton.
- Strauss, J., K. Beegle, B. Sikoki, A. Dwiyanto, Y. Herawati and F. Witoelar (2004). "The Third Wave of the Indonesia Family Life Survey (IFLS3): Overview and Field Report". March 2004. WR-144/1-NIA/NICHD.
- Townsend, Robert M. (1994). "Risk and Insurance in Village India", Econometrica 62(3):539-591. May 1994.
- Townsend, Robert (1995). "Consumption insurance: an evaluation of risk bearing systems in low-income countries" Journal of Economic Perspectives 9(3): 83-102
- Varadharajan, Sownya (2004). "Explaining participation in RoSCAs: Evidence from Indonesia". Cornell University (mimeo). URL" [http://people.cornell.edu/pages/sv49/Arisan\\_May%202004.pdf](http://people.cornell.edu/pages/sv49/Arisan_May%202004.pdf). Last accessed May 26, 2006.
- Wetterberg, Anna (2005). "Crisis, Social Ties and Household Welfare: Testing Social Capital Theory with Evidence from Indonesia." The World Bank Indonesian Social Development Paper No. 5, April 2005.

**Table 1. Mean household expenditure by quintile, 1997-2000  
(in 1997 constant prices)**

	<b>Mean 1997 (Std. error)</b>	<b>Mean 2000 (Std. error)</b>	<b>Change</b>
<b>All</b>	4,382,383 (132,681)	4,378,366 (121,355)	0.00
<b>1<sup>st</sup> quintile (poorest)</b>	935,828 (15,336)	964,729 (15,240)	0.03
<b>2<sup>nd</sup> quintile</b>	2,048,386 (9,919)	2,065,349 (9,222)	0.01
<b>3<sup>rd</sup> quintile</b>	3,224,231 (13,233)	3,169,835 (10,962)	-0.02
<b>4<sup>th</sup> quintile</b>	5,207,362 (26,569)	4,957,056 (24,085)	-0.05
<b>5<sup>th</sup> quintile (richest)</b>	13,200,000 (344,125)	12,700,000 (324,874)	-0.04

*Source: IFLS data set, authors' own calculation*

**Table 2. Probability of being employed in the past 5 years**

	<b>Mean</b>	<b>Std. Error</b>
Employed in 1997	0.9582	0.0031
Employed in 1998	0.9624	0.0030
Employed in 1999	0.9654	0.0030
Employed in 2000	0.9655	0.0033
Probability of being employed in 1997-2000	0.9629	0.0024

*Source: IFLS data set, authors' own calculation.*

**Table 3. Summary statistics of independent variables and instruments**

<b>Household Characteristics</b>	<b>Mean</b>	<b>Std. error</b>
Household Size 1997	5.10	0.05
Household Size 2000	5.49	0.06
Own house in 1997	0.87	
# of children below 5 in 1997	0.51	0.01
# of children 5-10 years old in 1997	0.52	0.02
# of members by education:		
No schooling	1.13	0.04
Elementary	2.36	0.04
Junior Secondary	0.72	0.02
Senior Secondary	0.63	0.03
University/academy	0.15	0.01
<b>Head of Household Characteristics</b>		
Age of household head in 1997	49.00	0.26
Female	0.18	
Education:		
No schooling	0.21	
Elementary	0.55	
Junior Secondary	0.10	
Senior Secondary	0.11	
University/academy	0.03	
<b>Participation in 1997</b>		
HH with any participation	0.81	
# of participation	3.64	0.08
HH with any arisan	0.51	
# of arisan	2.03	0.05
<b>Changes in log HH income, 1997-2000</b>		
All	0.30	0.03
1 <sup>st</sup> quintile (poorest)	0.07	0.07
2 <sup>nd</sup> quintile	0.43	0.05
3 <sup>rd</sup> quintile	0.09	0.04
4 <sup>th</sup> quintile	-0.14	0.04
5 <sup>th</sup> quintile (richest)	-0.37	0.04
<b>HH Asset in 1997 (Rp)</b>		
All	20,400,000	1,214,358
1 <sup>st</sup> quintile (poorest)	584,983	45,352
2 <sup>nd</sup> quintile	2,961,323	28,398
3 <sup>rd</sup> quintile	7,236,433	61,773
4 <sup>th</sup> quintile	17,000,000	150,604
5 <sup>th</sup> quintile (richest)	92,600,000	5,323,294

*Source: IFLS data set, authors' own calculation.*

**Table 4. OLS Regression results**

<i>Dependent variable: Changes in log HH expenditure</i>	OLS (1)	OLS (2)	OLS (3)	OLS (4)
Formal participation in 1997	-0.0123 (0.0045)***			
Time spent for formal participation in 1997		-0.00005 (0.00002)**		
Informal participation ( <i>arisan</i> ) in 1997			-0.0269 (0.0069)***	
Total participation in 1997				-0.0125 (0.0031)***
Changes in log HH income	0.1031 (0.0238)***	0.1065 (0.0240)***	0.1000 (0.0150)***	0.1064 (0.0249)***
Changes in log community income	0.4548 (0.0458)***	0.0240 (0.0461)***	0.4553 (0.0442)***	0.4550 (0.0449)***
Dummy for any formal participation * changes in log income	-0.0142 (0.0250)	-0.0177 (0.0251)		-0.0087 (0.0255)
Dummy for any informal participation * changes in log income			-0.0181 (0.0186)	-0.0173 (0.0189)
Log of assets in 1997	-0.0159 (0.0078)**	-0.0167 (0.0078)**	-0.0139 (0.0079)*	-0.0145 (0.0078)*
Female head dummy	0.0317 (0.0371)	0.0412 (0.0362)	0.0454 (0.0348)	0.0310 (0.0367)
Urban dummy	0.0112 (0.0226)	0.0122 (0.0226)	0.0203 (0.0223)	0.0146 (0.0226)
Constant	0.7808 (0.2610)***	0.7869 (0.2654)***	0.7260 (0.2711)***	0.7496 (0.2622)***
N	7099	7099	7099	7099
F-statistics	22.82***	22.51***	24.91***	22.13***
R-squared	0.132	0.131	0.133	0.133

*Note: weighted, stratified and clustered regression. Figures in parentheses are robust standard errors. Controls are changes in household size, province dummies and education dummies.*

\*\*\* Significant at 1%. \*\* Significant at 5%. \* Significant at 10%.

**Table 5. Testing the instruments: 1<sup>st</sup>-stage linear regression results**

<i>Ordinary Least Square</i>	<b>Dependent variables</b>			
	Formal participation in 1997	Time spent for formal participation in 1997	Informal participation in 1997	Total participation in 1997
# of children below the age of 5	.4692*** (.06110)	-3.3907 (7.72485)	.0841*** (.02740)	.5535*** (.07619)
# of children aged 6-10	-.3610*** (.06445)	-18.5934** (8.05264)	-.0389 (.03000)	-.4000*** (.08246)
N	7979	7979	7979	7979
<b>F-statistics</b>	<b>38.85***</b>	<b>9.79***</b>	<b>27.52***</b>	<b>41.21***</b>
R-squared	0.2696	0.0534	0.2852	0.3256

*Note: weighted, stratified and clustered regression. Controls are female head of household dummy, changes in log household income, changes in log community expenditure, log of household assets, urban, education, change in household size and province dummies. Figures in parentheses are robust standard errors. \*\*\* Significant at 1%. \*\* Significant at 5%. \* Significant at 10%.*

**Table 6. 2SLS Regression results**

<i>Dependent variable: Changes in log HH expenditure</i>	<b>IV</b> (1)	<b>IV</b> (2)	<b>IV</b> (3)	<b>IV</b> (4)
Formal participation in 1997	-0.0198 (0.0264)			
Time spent for formal participation in 1997		-0.0002 (0.0013)		
Informal participation ( <i>arisan</i> ) in 1997			-0.1249 (0.1839)	
Total participation in 1997				-0.0166 (0.0230)
Constant	0.7873 (0.2566)***	0.8268 (0.4648)***	0.8425 (0.3837)***	0.7472 (0.2583)***
N	7099	7099	7099	7099
F-statistics	17.37***	18.13***	11.06***	17.22***
R-squared	0.120	0.116	0.065	0.121

*Note: weighted, stratified and clustered regression. Controls are female head of household dummy, changes in log household income, changes in log community expenditure, log of household assets, urban, education, change in household size and province dummies. Figures in parentheses are robust standard errors. \*\*\* Significant at 1%. \*\* Significant at 5%. \* Significant at 10%.*

**Table 7. Probability of being employed and participation**

<i>Dependent variable: Probability of being employed in 1997-2000</i>	<b>OLS</b>	<b>OLS</b>	<b>OLS</b>	<b>OLS</b>	<b>OLS</b>	<b>OLS</b>
	(1)	(2)	(3)	(4)	(5)	(6)
Participation in formal activities in 1997	-0.0010 (0.0009)	-0.0010 (0.0009)	-0.0011 (0.0009)	-0.0010 (0.0009)		-0.0012 (0.0011)
Participation in informal activities in 1997 ( <i>arisan</i> )	0.0009 (0.0016)	0.0021 (0.0017)	0.0010 (0.0017)	0.0011 (0.0017)		0.0005 (0.0018)
Overall participation in 1997					-0.0005 (0.0008)	
Time spent in formal activities in 1997 (100hrs)						-0.0002 (0.0007)
Money spent in formal activities in 1997 (1000 Rps)						4.01E-05 (1.60 E-05)**
Money spent in <i>arisan</i> in 1997 (1000 Rps)						3.71E-05 (1.81 E-05)**
Log of per capita assets in 1997	-0.0013 (0.0016)	0.0000 (0.0017)	0.0002 (0.0017)	0.0001 (0.0017)	0.0003 (0.0017)	-0.0001 (0.0017)
Male head dummy	0.0838 (0.013)***	0.0870 (0.0131)***	0.0885 (0.0132)***	0.0884 (0.0132)***	0.0881 (0.0132)***	0.0885 (0.0132)***
Head age	0.0229 (0.0017)***	0.0215 (0.0017)***	0.0217 (0.0017)***	0.0217 (0.0017)***	0.0217 (0.0017)***	0.0218 (0.0017)***
Head age squared	-0.0003 (0)***	-0.0002 (0)***	-0.0002 (0)***	-0.0002 (0)***	-0.0002 (0)***	-0.0002 (0)***
Urban dummy	-0.0204 (0.005)***	-0.0146 (0.0054)***	-0.0095 (0.0054)*	-0.0100 (0.0054)*	-0.0090 (0.0053)*	-0.0101 (0.0053)*
Constant	0.4173 (0.0434)***	0.4370 (0.0444)***	0.4398 (0.0456)***	0.4846 (0.0474)***	0.4376 (0.0452)***	0.4869 (0.0474)***
Education controls	No	Yes	Yes	Yes	Yes	Yes
Province controls	No	No	Yes	Yes	Yes	Yes
Religion controls	No	No	No	Yes	Yes	Yes
N	5532	5326	5326	5326	5326	5326
F-statistics	37.67***	20.58***	13.13***	11.05***	13.69***	10.16***
R-squared	0.091	0.090	0.096	0.097	0.096	0.098

*Note: Weighted, stratified and clustered regressions. Figures in parentheses are robust standard errors.*

\*\*\* Significant at 1%. \*\* Significant at 5%. \* Significant at 10%.

**Table 7. Probability of being employed and participation (cont.)**

<i>Dependent variable: Probability of being employed in 1997-2000</i>	<b>OLS</b> (7)	<b>OLS</b> (8)	<b>OLS</b> (9)	<b>OLS</b> (10)	<b>OLS</b> (11)
Participation in any formal activity in 1997	-0.0109 (0.0077)	-0.0092 (0.0079)	-0.0082 (0.0079)	-0.0076 (0.0079)	-0.0075 (0.0079)
Participation in any informal activity ( <i>arisan</i> ) in 1997	0.0055 (0.0043)	0.0080 (0.0045)*	0.0059 (0.0045)	0.0063 (0.0045)	0.0054 (0.0045)
Time spent in formal activities in 1997 (100hrs)					-3.97E-04 (0.0006)
Money spent in formal activities in 1997 (1000 Rps)					3.66E-05 (1.540 E-05)**
Money spent in <i>arisan</i> in 1997 (1000 Rps)					2.85E-05 (1.87 E-05)
Log of per capita assets in 1997	-0.0016 (0.0016)	-0.0001 (0.0017)	0.0000 (0.0017)	0.0000 (0.0017)	-0.0003 (0.0017)
Male head dummy	0.0848 (0.0132)***	0.0878 (0.0134)***	0.0889 (0.0134)***	0.0887 (0.0134)***	0.0887 (0.0134)***
Head age	0.0229 (0.0017)***	0.0214 (0.0017)***	0.0216 (0.0017)***	0.0217 (0.0017)***	0.0217 (0.0017)***
Head age squared	-0.0003 (0)***	-0.0002 (0)***	-0.0002 (0)***	-0.0002 (0)***	-0.0002 (0)***
Urban dummy	-0.0210 (0.005)***	-0.0148 (0.0054)***	-0.0100 (0.0054)*	-0.0106 (0.0054)*	-0.0107 (0.0054)**
Constant	0.4239 (0.0434)***	0.4419 (0.0443)***	0.4461 (0.0452)***	0.4929 (0.047)***	0.4964 (0.0471)***
Education controls	No	Yes	Yes	Yes	Yes
Province controls	No	No	Yes	Yes	Yes
Religion controls	No	No	No	Yes	Yes
N	5532	5326	5326	5326	5326
F-statistics	37.00***	20.22***	13.07***	10.97***	10.16***
R-squared	0.092	0.090	0.097	0.097	0.098

*Note: Weighted, stratified and clustered regressions. Figures in parentheses are robust standard errors.*  
 \*\*\* Significant at 1%. \*\* Significant at 5%. \* Significant at 10%.