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Social Capital, Household Welfare and Poverty in Indonesia

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1. Introduction

There is a growing recognition that differences in economic outcomes, whether at the level of the individual or household or at the level of the state, cannot be explained fully by differences in "traditional" inputs such as labor, land, and physical capital. Growing attention is given to the role of "social capital" in affecting the well-being of households and the level of development of communities and nations.

The recognition that social capital is an input in a household's or a nation's production function has major implications for development policy and project design. It suggests that the acquisition of human capital and the establishment of a physical infrastructure needs to be complemented by institutional development in order to reap the full benefits of these investments. The promotion of social interaction among poor farmers may need to complement the provision of seeds and fertilizer. A well functioning parent-teacher association may be a necessary complement to building schools and training teachers.

While there are many definitions and interpretations of the concept of social capital, there is a growing consensus that "social capital stands for the ability of actors to secure benefits by virtue of membership in social networks or other social structures" (Portes, 1998, p. 6). If one takes a broad view of what is comprised by these "other social structures," then social capital is a relevant concept at the micro, meso, and macro levels.[1]

[1] Reviews of the social capital literature can be found in Grootaert (1997), Portes (1998), Woolcock (1998) and Narayan and Woolcock (1999). On the role of social capital in sustainable development, see Serageldin (1996).

At the macro level, social capital includes institutions such as government, the rule of law, civil and political liberties, etc. There is overwhelming evidence that such macro-level social capital has a measurable impact on national economic performance (Knack, 1999). At the micro and meso levels, social capital refers to the networks and norms that govern interactions among individuals, households and communities. Such networks are often (but not necessarily) given structure through the creation of local associations or local institutions.[2]

Putnam's (1993) seminal analysis of civic traditions in Italy focuses primarily on "horizontal" associations in which members relate to each other on an equal basis, but Coleman (1988, 1990) has argued that social capital can include "vertical" associations as well, characterized by hierarchical relationships and unequal power distribution among members.

The analysis in this paper is limited to social capital at the micro level (individuals, households) and at the meso level (community). We utilize the broader definition which includes both horizontal and vertical associations. The objective of the paper is to investigate empirically the links between social capital, household welfare and poverty in the case of Indonesia. Specifically, we undertake a multivariate analysis of the role of local institutions in affecting household welfare and poverty outcomes and in

[2] We use the term "local institution" interchangeably with "local association" or "local organization". This follows the practice of most social science literature (Uphoff, 1993), but there is a subtle distinction between the two concepts. Uphoff (1993) defines institutions as "complexes of norms and behaviors that persist over time by serving collectively valued purposes" (p. 614), while organizations are "structures of recognized and accepted roles" (p. 614). Examples of institutions are money, the law, marriage. Organizations are PTAs, workers' unions, rotating credit associations. In some cases, the two terms overlap: the army is an institution as well as a group of soldiers, the parliament is a law-making institution as well as an association of law makers. As Uphoff (1993) argues, the distinction is a matter of degree, and organizations can become more or less "institutional" over time.

determining access to services. In that setting, we compare the impact of household memberships in local associations with the impact of human capital.

The literature contains an impressive and still growing number of case studies which document that local associations play a key role in successful project design and in determining project sustainability. This has been demonstrated in almost all parts of the world and in sectoral settings ranging from irrigation and water supply, to forest management and management of wildlife resources, to the provision of credit to the poor and the implementation of health service programs.[3] The way local associations perform their useful role is centered around three mechanisms: the sharing of information among association members, the reduction of opportunistic behavior, and the facilitation of collective decision making (Grootaert, 1997; Collier, 1998b).

At the level of the community, local associations can be a manifestation of social capital. However, it must be emphasized that social capital and local associations are not synonyms. Social capital can and does exist outside the context of local institutions (whether formal or informal). For example, two neighbors who help each other in times of trouble have social capital but may never embody their bond in an association. Vice versa, the mere presence of an association does not prove the existence of social capital. Local branches of political parties, with mandatory membership, are associations which may display little or no social capital. For that reason, it is important to look at

[3] Many case studies are cited by Uphoff (1993), Narayan (1995), Grootaert (1997), Krishna et al (1997), Uphoff et al (1998), and Woolcock (1998).

membership conditions (voluntary or not, payment of fees, etc.) and the degree of effective participation in associations before inferring social capital effects. The analysis below will include some of these aspects.

While the literature on social capital has amply demonstrated the importance of social capital in the context of development projects and the provision of various services, it has not yet demonstrated what the implications of the presence of social capital are for the welfare of households and whether social capital helps the poor. Indeed, the distribution of social capital, like other forms of capital, could well be skewed in favor of the rich. Furthermore, most empirical studies of the impact of social capital are set in the context of a specific project or in a limited geographical area (village/region). The use of national-level data bases is quite rare. These studies have also rarely quantified the impact of social capital in a formal analysis, i.e. controlling for other factors which affect outcomes.[4] Notable exceptions are Isham, Narayan and Pritchett (1995) who measure quantitatively the relative contribution of beneficiary participation on the effectiveness of rural water supply projects, and Isham, Kaufmann and Pritchett (1995) who demonstrate that the rate of return of World Bank-financed projects is greater in countries with good civil liberties, after controlling for a variety of other determinants of project performance.[5]

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[4] There is a certain irony to this, given that Coleman's (1988) seminal work on the role of social capital in the acquisition of human capital—the article most frequently cited as being at the origin of the current interest in social capital—included a formal quantitative approach (logit regressions of social capital on drop-out rates among U.S. high school students).

[5] In contrast to the literature of social capital at the household, community or project level, the literature that investigates the effects of social capital at the level of the nation is highly quantitative and a large portion of it consists of econometric cross-country analyses. Knack (1999) reviews this literature.

A recent study by Narayan and Pritchett (1997) has demonstrated econometrically that the ownership of social capital by households in Tanzania has strong effects on households' welfare. The study found that the magnitude of the estimated effect exceeds that of education and physical assets owned by the household. It also concluded that the effects of social capital operate primarily at the village level. Instrumental variable methods were used to rule out reverse causation from income to social capital. The authors measured social capital as a single index, combining (interactively) the number of local groups in a village, kin and income heterogeneity, and effective group functioning. The relevance of these aspects of social capital have been demonstrated in the literature. Putnam (1993) has suggested that it is the density of associations that primarily explains the difference in economic performance between North and South Italy. Other authors have focused on the nature of participation in groups and the structure of the groups (Uphoff, 1992; Narayan, 1995; Ostrom, 1995).

The Narayan/Pritchett study is a pioneering effort in the way different social capital dimensions are combined to estimate quantitatively their impact on household welfare based on a national-level household survey. The study's remarkable finding that in Tanzania social capital matters more for household welfare than human capital, constitutes a challenge to investigate this issue for other countries to assess how general this finding is. We undertake this task for Indonesia in this paper, and for Bolivia and Burkina Faso in companion papers (Grootaert and Narayan, 1999; Grootaert, Oh and Swamy, 1999). However, in these papers, we go well beyond replication and extend the analysis in several directions, which will shed additional light on the way social capital embodied in local institutions affects household welfare.

First, we consider six social capital dimensions: the density of associations, their internal heterogeneity, the frequency of meeting attendance, members' effective participation in decision making, payment of dues (in cash and in kind), and the community orientation of associations (section 3). These can be combined in an index or each dimension can be considered in the model separately. Since the conceptual literature on social capital does not provide guidance to prefer one approach over the other, we test both approaches empirically (sections 4 and 5).

Second, in addition to estimating the effects on household welfare, we model the impact of ownership of social capital on the incidence of poverty. We also attempt to compare the returns to social capital between poor and non-poor households (section 5).

Third, the impact of social capital on household welfare is usually indirect: it operates through access to credit, asset accumulation, collective action, etc. We will attempt to measure some of these links directly (sections 6.1 to 6.3).

Fourth, we revisit the question of whether social capital operates at the household level or at the village level. While Narayan and Pritchett relied on village averages of household-level indicators, the analysis below uses independent and historical village information (section 6.4).

Fifth, the Tanzania study did not distinguish between different types of organizations and assumed in fact that each association has the same effect, regardless of whether it is, e.g., a parent/teacher association, a church group, or a local political party committee. In the analysis below, we differentiate four types of institutions and pay

specific attention to the differential impact between voluntary associations and those with mandatory membership (section 7).

Lastly, we revisit the question of causality: does social capital cause higher incomes or do households with high incomes have better access to associational life? We use instrumental variable methods using independent village data to address this question (section 8).

Before turning to the empirical results, we discuss in the next section the data set, and the comparative study of which it is part.

2. The Data Set

The data set for this paper comes from the Local Level Institutions (LLI) Study, a comparative study of three countries (Bolivia, Burkina Faso and Indonesia), which aims to investigate the role of local institutions in providing service delivery and in affecting welfare and poverty outcomes.[6] Data were collected at the level of the community, the district and the household.

At the level of the *community*, interviews with focus groups of households and with community leaders were held to establish a map of functioning institutions in the community. Three instruments were used:

- Information on community services was obtained through interviews with key informants such as village chief, teacher, health provider, etc. This was supplemented with information on the local economy (infrastructure and distance to markets), local society (ethnic/religious composition) and local institutions. Recent experience with selected development projects was also discussed.

- The community services were also discussed with groups of households, with an objective to learn the community's perspective on the quality of service, its experience with collective action, and its views on local institutions and development projects.

[6] The objective of the Local Level Institutions study and the questionnaires are further discussed in World Bank (1998).

- For the most important local institutions, interviews were held with leaders and members, as well as with non-members, in order to get a balanced view of the role of the institutions in the village, their development over time, their main activities, relations with other institutions and government, and their main strengths and weaknesses.

At the *district* level (defined as the administrative level above the village or community), data were collected about the extent of service coverage and the institutional arrangements for the provision of services. Information was also obtained about the general functioning of the district administration and its relation with civic organizations, through interviews with general and sectoral managers at the district level.

The third and critical part of the data collection was a *household survey* which aimed to capture households' actual participation in local institutions, their use of services, and information that identifies the welfare level of households and their coping strategies. The questionnaire consisted of six sections:

- demographic information on household members
- participation in local institutions
- characteristics of the most important groups
- service provision profiles
- perceptions of community trust and collaboration
- household economy and coping strategies.

The limited resources available did not make possible a sampling framework such that the studies would be representative of the countries at the national level. Instead, three or four areas were selected in each country (municipios in Bolivia, provinces in Burkina Faso and Indonesia), which represent different economic, social and institutional environments.

In the case of Indonesia, the collected data cover the rural areas of three provinces: Jambi, Jawa Tengah, and Nusa Tenggara Timur (NTT). Jambi is located on the island of Sumatra. It is a tropical forest area which was only recently colonized and is still an agricultural frontier zone. It is characterized by low population density and its socio-economic indicators are close to Indonesian averages or slightly below (Table 1). Among the three provinces, Jambi has the lowest level of inequality in the distribution of household expenditure. Jawa Tengah is in the center of the island of Java, about 500 kms away from Jakarta. It has a very high population density (867 people/km^2) and is the most urbanized of the three provinces. It has also the highest income level and the best access to education and health services and to housing amenities. The population of both Jambi and Jawa Tengah is 99% Muslim. NTT consists of a series of islands in the eastern part of Indonesia (about 2500 kms and two time zones away from Jambi) and is the poorest and least urbanized of the three study areas. It relies heavily on traditional agriculture and fewer than 5% of its economically active population have wage-jobs. The population is almost entirely Christian, evenly divided between Catholics and Protestants.

Within each province two districts (kabupaten) were selected to participate in the study, and within each district two sub-districts (kecamatan) were selected. These units were selected purposively so as to represent a range of social, economic and institutional

situations. Within each sub-district, four villages were selected based on location criteria (upland/lowland and near/far to growth center). Within each of the 48 villages, 25 households were selected randomly to participate in the household survey.[7] The sub-districts were Sarolangon Bangko and Batang Hari in Jambi, Banyumas and Wonogiri in Jawa Tengah, and Timor Tengha Selatan and Ngada in NTT. In each sub-district, 200 households were interviewed for a total sample of 1,200 households.[8]

Table 1: Selected Socio-economic Indicators of the Three Study Areas

	Jambi	**Jawa Tengah**	**Nusa Tenggara Timur**	**Indonesia**
Population ('000)	2,370	29,653	3,577	194,755
Area ('000 km^2)	44.8	34.2	47.9	1,919.3
Population Density (people/km^2)	53	867	75	101
% Urbanized	27.2	31.9	13.9	35.9
% of Households with Access to Electricity	30.5	71.1	14.5	57.2
Gross Primary Enrollment Ratio	95	97	91	95
Gross Secondary Enrollment Ratio	47	58	44	56
% of Heads of Household who are Farmers	71	67	92	77[1/]
Household Expenditure per Capita ('000 Rupiah/year)[2/]	575.3	612.4	453.8	547.1[1/]
Gini-coefficient	0.29	0.36	0.37	0.35[1/]

1 Based on the three study areas only.
2. At the time of data collection (Fall 1996) the exchange rate was in the range of $1 = 2,300-2,400 Rupiah.

Sources: Statistical Yearbook of Indonesia 1995; Statistik Pendidikan 1994/95; Penduduk Indonesia, Jambi, Jawa Tengah, NTT-Hasil Survei Penduduk Antar Sensus 1995; author's calculations.

[7] The data were collected in the fall of 1996, i.e. prior to the recent social and economic crisis in Indonesia. The macroeconomic evolution in the country is reviewed in Thorbecke (1991) and World Bank (1996). Tjiptoherijanto (1996) reviews the evolution of poverty and inequality. Thorbecke (1998) provides an initial assessment of the social costs of the crisis.

[8] Grootaert (1999) further discusses the demographic and economic characteristics of the sample households.

3. The Dimensions of Social Capital

The effectiveness with which social capital, in the form of local associations, can fulfill its role in disseminating information, reducing opportunistic behavior, and facilitating collective decision making depends on many aspects of the association, reflecting its structure, its membership and its functioning. For this study we focus on six aspects of local associations.

(1) **Density of membership**. This is measured by the number of memberships of each household in existing associations. The provision of a map of local associations was one of the prime objectives of the LLI study and a complete inventory of all existing associations was made at the village level. Each household was then given that inventory and asked which associations they were a member of. The total number of active memberships in the villages included in the sample added up to 6,210, which indicates that on average each household is a member of about five associations. However, there is significant variation by province and according to the characteristics of the households.

With an average of 3.7 associational memberships per households, density is lowest in Jambi. In Jawa Tengah, each household belongs on average to 6 groups and in NTT to 6.5 groups (Table 2). This is in part related to the religious composition of the population since Catholic households (who live only in NTT) are on average members of 8.3 groups, almost twice as much as households of other religions. Female-headed households belong on average to one group less than male-headed households. Memberships rise quite sharply with the level of education but, at an aggregate level, they are only slightly related to income level.

(2) **Heterogeneity index**. The LLI questionnaire identifies the three most important associations for each household. For those associations, a number of supplementary questions were asked including about the internal homogeneity of the group. This was rated according to eight criteria: neighborhood, kin group, occupation, economic status, religion, gender, age, and level of education. On that basis, we constructed a score ranging from 0 to 8 for each of the three associations (a value of one on each criterion indicated that members of the association were "mostly from different" kin groups, economic status, etc.). The score of the three associations was averaged for each household and the resulting index was re-scaled from 0 to 100 (whereby 100 corresponds to the highest possible value of the index).[9]

The index of heterogeneity shows distinct regional and socio-economic patterns (Table 2). Associations in Jambi are much more homogeneous than in the other two provinces. Associations to which Protestant households belong are the most heterogeneous. The index follows a U-shaped pattern in relation to education and income quintile: Heterogeneity rises with education and with income except at the very bottom of the distribution.

[9] We also considered alternative weighting schemes: (i) weights based on a principal component analysis of the heterogeneity criteria; and (ii) giving larger weights to the economic criteria (occupation, economic status, education) on the assumption that an association of people with e.g. different occupations presents greater opportunities for information sharing than e.g. a group with different ages. The empirical results on the importance of the heterogeneity index were not altered substantively by changing the weights. We are grateful to Jonathan Isham and Michael Woolcock for having suggested these alternatives and for helpful discussions on the issue of heterogeneity.

It is not immediately obvious whether a high degree of internal heterogeneity is a positive or negative factor from the point of view of social capital. One could argue that an internally homogeneous association will make it easier for members to trust each other, to share information and to reach decisions.[10] On the other hand, they may also have similar information so that less is gained from exchanging information. Furthermore, the coexistence of a series of associations which are each internally homogenous, but along different criteria, could render the decision making process at the village level more difficult. The heterogeneity index will allow us to assess empirically the impact of this factor.

(3) **Meeting attendance**. A priori, it would appear that membership in an association is of little value if one does not attend the meetings with the other group members. We therefore constructed a meeting attendance index which measures the average number of times someone from the household attended group meetings, normalized for the number of memberships of each household.

For each membership in an association, the average sample household attends 6.0 meetings in a three-month period. This figure, however, is slightly higher in Jambi (6.8), which is probably the flip side of the lower number of memberships in that province. Presumably if one is a member of fewer associations, it is possible to go more frequently to their meetings. This is also reflected by the religious dimension since Catholic households, who are members of more associations, attend each one's meetings less

[10] Evidence indicates that homogeneity facilitates the adoption of new technology (Rogers, 1995; Isham, 1998).

frequently than households of other religions. Meeting attendance follows an inverted U-pattern with respect to income and education: people with primary or vocational education, and those in the second expenditure quantile attend meetings most frequently.

(4) **Decision making index**. It has been argued that associations which follow a democratic pattern of decision making are more effective than others. The LLI questionnaire asked association members to evaluate subjectively whether they were "very active" "somewhat active" or "not very active" in the group's decision making. This response was scaled from 2 to 0 respectively, and averaged across the three most important groups in each household. The resulting index was re-scaled from 0 to 100.

The index of active participation in decision making is significantly higher in NTT than in the other two provinces (Table 2). It is also higher for male-headed than female-headed households. There is a very pronounced pattern of rising participation in decision making with level of education and income. Thus, the poorest and least educated households participate less actively in the decision making of the associations of which they are a member.

Table 2: Social Capital Dimensions, by Region and Household Characteristics

	Memberships	Index of Heterogeneity	Meeting Attendance	Index of Participation in Decision Making
Province				
Jambi	3.7	38.9	6.8	63.5
Jawa Tengah	6.0	57.6	6.0	55.6
NTT	6.5	61.6	5.2	71.4
Head of Household				
Male	5.5	53.6	6.0	64.1
Female	4.6	49.2	5.9	57.1
Religion				
Muslim	4.9	49.2	6.3	59.5
Catholic	8.3	58.7	4.8	71.6
Protestant	4.7	63.7	5.7	70.7
Education of Head of Household				
None	4.5	52.5	5.5	53.5
Primary School — Incomplete	5.2	51.5	6.0	60.0
Primary School — Complete	5.7	53.0	6.4	65.7
Secondary School — Incomplete	6.0	54.1	5.7	68.3
Secondary School — Complete	6.6	64.0	4.3	72.9
Vocational	4.8	59.2	6.5	83.3
University/Other	8.3	51.9	3.0	77.5
Quintile of Household Expenditure Per Capita				
Poorest	5.4	52.9	5.7	55.0
2	5.5	50.9	7.0	64.5
3	5.4	51.9	6.2	65.0
4	5.4	54.6	5.8	66.6
Richest	5.6	56.2	5.1	66.5
All	5.5	53.3	6.0	63.5

Note: Variable definitions are (for details, see text):

- memberships: average number of active memberships per household
- index of heterogeneity: scale (0-100) of internal heterogeneity of the three most important groups, according to eight criteria
- meeting attendance: average number of times a household member attended a group meeting in the last three months, normalized for the number of memberships
- index of participation in decision making: scale (0 to 100) of extent of active participation in decision making in the three most important groups.

Table 2 (Continued): Social Capital Dimensions, by Region and Household Characteristics

	Cash Contribution	Work Contribution	Community Orientation
Province			
Jambi	2,331	1.0	62.2
Jawa Tengah	2,507	12.7	48.0
NTT	2,433	67.7	49.5
Head of Household			
Male	2,439	28.9	52.1
Female	2,289	20.2	61.8
Religion			
Muslim	2,477	7.2	54.4
Catholic	3,757	67.8	54.6
Protestant	751	69.6	44.8
Education of Head of Household			
None	1,411	22.5	55.8
Primary School — Incomplete	1,910	19.3	55.1
Primary School — Complete	2,615	32.3	53.2
Secondary School — Incomplete	2,908	41.9	46.0
Secondary School — Complete	5,720	46.2	45.9
Vocational	2,423	15.4	48.9
University/Other	2,580	36.3	44.4
Quintile of Household Expenditure Per Capita			
Poorest	1,519	39.5	51.9
2	2,378	28.5	55.1
3	2,887	29.2	54.3
4	1,760	20.6	52.1
Richest	3,588	23.2	51.1
All	2,427	28.2	52.9

Note continued:

- Cash contribution: amount of fees (Rupiahs per month) paid for memberships in the three most important groups.
- Work contribution: number of days worked per year as membership contribution in the three most important groups.
- Community orientation: percent of memberships in organizations which are community-initiated.

(5) **Membership dues**. All other things being equal, it is presumably a sign of greater interest in the association if one is willing to pay membership dues. Only 30% of memberships in our sample involved payment of such fees, which on average amounted to 2,427 Rupiahs per month (Table 2). The amount paid rises quite sharply with level of education and income. In addition, about 30% of households also provide a labor contribution, which on average amounts to 28 days per year. This practice is largely confined however to NTT, where it averages 68 days per year. Labor contributions fall quite steeply with rising income level.

(6) **Community orientation**. Many case studies on the functioning of local associations have argued that voluntary organizations that find their roots in the community are more effective than externally imposed and/or mandated groups (Uphoff, 1992; Narayan, 1995; Ostrom, 1995). In the three Indonesian study provinces, slightly more than half of all memberships are in organizations which were initiated by the community (Table 2). This community orientation is much higher though in Jambi. Female-headed households also tend to join community-initiated groups more frequently than male-headed households.

4. Household Welfare and Social Capital: The Aggregate Model

The basic question to be addressed is: Are households with high levels of social capital better off? Table 3 provides a descriptive answer. We grouped households in quintiles based on their ranking on an additive social capital index. Anticipating somewhat our regression results, we selected the number of memberships and the index of active participation in decision making to construct (with equal weights) an additive social capital index.[11] It turns out that households with higher social capital have higher household expenditure per capita, more assets, better access to credit and more likely to have increased their savings in the past year. They are also less likely to have their children not attend school. There was no relation between the level of social capital and the need to sell assets to make ends meet or to go hungry. While the strength of the correlation between social capital and welfare outcomes differs by indicator, the overall pattern is quite strong: social capital correlates positively with household welfare.

[11] An alternative additive index based on all seven, equally weighted, social capital dimensions yielded similar results.

Table 3: Household Welfare Indicators, by Levels of Social Capital

	Social Capital Quintiles[1/]					All
	1 (Poorest)	2	3	4	5 (Richest)	
Household Expenditure per Capita ('000 Rupiahs per year)	498.0	560.8	537.4	569.0	572.5	547.5
Asset Index[2/]	0.43	0.58	0.60	0.68	0.51	0.56
% of Children Not Attending School	19.5	17.2	11.9	14.1	13.6	15.1
% of Households Going Hungry	11.9	7.9	8.3	9.7	9.2	9.4
% of Households with Access to Credit	57.3	59.9	60.1	64.3	64.5	61.2
Amount of Credit Received ('000 Rupiah)	158.0	366.6	685.0	918.0	502.8	534.7
% of Households with Increased Savings in Past Year	12.8	11.5	20.6	16.3	21.5	16.5
% of Households with Forced Asset Sales	26.9	16.3	29.8	22.9	35.1	26.2

Notes: 1. Households were grouped in quintiles based on their ranking on the social capital index calculated as the average of the number of memberships and the index of participation in decision making.
2. The asset index ranges from 0 to 3 and is based on a principal component analysis of household ownership of 15 durable goods (car, boat, stereo system, etc.).

A conventional model of household economic behavior can readily be adjusted to reflect the role of social capital. Such a model consists of three sets of equations:

- The first set of equations explains the income generation behavior of the household and describes how the household combines its various asset endowments to make decisions regarding labor supply for each of its members, taking the wage rates and demand situation in the labor market as given. In this formulation, social capital can be considered as one among several classes of assets available to the household to make its decisions. Social capital is combined with human capital, physical capital and the ownership of land to make productive decisions.

- The second set of equations portrays the household's demand for inputs (agricultural inputs, credit) and services (education, health) which may need to

be combined with labor supply in order to generate income. Here too, social capital is one category of capital which determines these decisions.

- A third set of equations explains the households' consumption and savings behavior as a function of the level and composition of income.

The customary reduced-form model of these structural equations relates household expenditure directly to the exogenous asset endowment of the household and yields the following estimating equation:[12]

$$\lambda n \mathrm{E}_i = a + bSC_i + gHC_i + dOC_i + eX_i + hZ_i + u_i \qquad (1)$$

Where E_i = household expenditure per capita of household i
SC_i = household endowment of social capital
HC_i = household endowment of human capital
OC_i = household endowment of other assets
X_i = a vector of household characteristics
Z_i = a vector of village/region characteristics
u_i = error term

The key feature of this model is the assumption that social capital is truly "capital" and hence has a measurable return to the household. Social capital has many "capital" features: it requires resources (especially time) to be produced and it is subject to accumulation and decumulation.[13] Social capital can be acquired in formal or informal settings, just like human capital (e.g., schools versus learning-by-doing). Much social capital is built during interactions which occur for social, religious, or cultural reasons.

[12] This reduced-form model was also the basis for the earlier cited study by Narayan and Pritchett (1997) on social capital in Tanzania.

This is reflected clearly in the pattern of associational memberships in Indonesia, where almost one half of all memberships are groups which pursue social, religious or recreational purposes. On the other side of the spectrum are the government-sponsored associations, with mandatory membership, where interactions occur in a formal framework. The key assumption is that the networks built through these interactions have measurable benefits to the participating individuals, and lead, directly or indirectly, to a higher level of well-being. This is the proposition which we test empirically in this paper by means of equation (1). Structurally, the returns to social capital could be measured in the earnings functions if, e.g., one's network helps in getting better-paying jobs or promotions. It could also show up in the various functions which determine access to credit, agricultural inputs or other factors which enhance the productivity of a household enterprise. In the estimations below, we will focus on one such input, namely credit.[14]

The dependent variable of equation (1) is the natural logarithm of household expenditure per capita.[15] The explanatory variables consist of the asset endowment of the household, demographic control variables, and locational dummy variables. Household assets are assumed to consist of human capital, social capital, land, and physical assets. We have already discussed in the previous section the variables used to measure the

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[13] Events in transition economies such as Russia and former Yugoslavia are powerful evidence of the effects of the decumulation of social capital (Rose, 1995).

[14] If equation (1) is estimated over households, there is an implicit assumption that social capital is embodied in the members of the household. This conforms to the position advocated by Portes (1998), who highlights that, although the source of social capital is the relationships among a group of individuals, the capital itself is an individual asset. This is in contrast to e.g. the position of Putnam who sees social capital as a collective asset (Portes, 1998).

[15] This variable was constructed in nominal form. It is recognized that there might be a significant amount of regional price variation in Indonesia. As of writing we do not have access to a regional price index to deflate household expenditure per capita. We assume that the regional dummy variable included in the regression will capture price differences.

household's endowment of social capital. Human capital is measured conventionally by the years of education of the adult members of the household.[16] The LLI study data set contains information on land, cattle and farm equipment owned by the household. Direct inclusion of these variables as regressors in equation (1) is problematic due to possible endogeneity. Indeed, as Table 3 indicated, 26% of households sold assets to pay for consumption expenditures. Unfortunately, the data do not contain the stock of assets at the beginning of the consumption reference period. For that reason, we chose not to include the asset variables as regressors. Instead, we created a dummy variable to indicate whether the head of households was a farmer. This must be seen as an occupational variable as well as a proxy for ownership of agricultural assets.[17]

In addition, the regressions include demographic variables, such as household size and gender of the head of household. Age of the head of household and its squared term were included to capture the life cycle of household welfare. Lastly, two dummy variables were included to indicate province (Jambi was used as omitted category). These variables capture the general economic and social conditions of the provinces along dimensions other than those which we were able to include in the model.[18]

The first column in Table 4 replicates, as far as the data permit, the model that was used by Narayan and Pritchett (1997) for Tanzania. It consists of one aggregate social capital index, which is a multiplicative index between the density of associations, their internal heterogeneity and the index of active participation in decision making. The

[16] The LLI questionnaire recorded only the level of educational achievement of each adult in the household and the number of years of education was imputed from that information.

[17] In order to assess the impact of this decision, we re-estimated all equations reported in this paper with three asset variables capturing ownership of land, cattle and farm equipment. The substantive findings on the role of social capital were never affected.

model results suggest that human capital as well as social capital each have a significant positive effect on household welfare. However, one of the remarkable findings of the Narayan-Pritchett study was the large magnitude of the social capital effect: depending upon the specification, the social capital effect in Tanzania was found to be 4-10 times larger than the human capital effect. Although the results for Indonesia imply a larger effect from social capital than from human capital, the difference is not as large as in the case of Tanzania.

Table 4: Household Welfare and Social Capital: The Aggregate Model

	Narayan-Pritchett Specification		Modified Specification		Specification without Social Capital	
Intercept	13.3158	(181.04)	12.7948	(69.65)	12.6782	(67.59)
Social Capital Index	0.0066	(6.29)	0.0069	(6.52)	—	—
Household Size	-0.0998	(11.01)	-0.0972	(10.23)	-0.0923	(9.59)
Years of Education per Adult	0.0144	(1.96)	0.0343	(4.49)	0.0454	(6.11)
Female Head of Household	-0.0004	(0.01)	-0.0463	(0.67)	-0.0551	(0.81)
Age of Head of Household	—	—	0.0309	(3.75)	0.0354	(4.20)
Age of Head of Household Squared	—	—	-0.0003	(3.30)	-0.0003	(3.71)
Household Asset Score	0.3144	(9.32)	—	—	—	—
Farmer Household	-0.1249	(3.03)	-0.2311	(5.73)	-0.2417	(5.89)
Jawa Tengah	-0.0681	(1.73)	-0.1630	(3.90)	-0.0987	(2.40)
Nusa Tenggara Timur	-0.1307	(2.72)	-0.3271	(7.24)	-0.2201	(5.21)
Number of Observations	1137		1137		1137	
R-squared	0.28		0.24		0.21	
F-statistic	48.4		33.6		31.3	

Notes: 1. Dependent variable = ln (household expenditure per capita)
2. t-statistics are in parentheses and are based on robust standard errors (Hubert-White estimator for non-identically distributed residuals)

Furthermore, the results may be unduly influenced by the presence in Narayan and Pritchett's equation of an asset variable which includes several consumer durable goods. This is arguably endogenous in a model where total expenditure is the dependent variable. The asset variable is also correlated positively with education. This is readily apparent if we drop the asset variable from the RHS of the equation (column 2 of

[18] Means and standard deviations of regression variables are reported in Annex Table 9.

Table 4). The effect is that the coefficient of education increases by a factor of almost 2.5. The results now imply similar returns to human and social capital. A 10% increase in the household's human capital endowment would lead to an increase in expenditure of 1.65%, against a 1.18% increase stemming from a 10% increase in social capital endowment. In view of the endogeneity problem of the asset variable, we opt to retain the modified specification (which drops the durable-goods variable and adds the age variable to capture life cycle) for the rest of this paper.

The relative importance of social capital can be further understood by comparing the model with and without the social capital variable (columns 2 and 3 in Table 4). Including social capital increases the R-squared from 0.21 to 0.24. More importantly, it reduces the coefficient of human capital by about one-third. This suggests that at least some of the human capital effects operates through the networks and associations captured in the social capital index. In other words, there is some empirical validity to the proposition "It's whom you know, not what you know". However, our results also suggest that a better formulation might be "It's whom you know <u>and</u> what you know".

In addition to the estimated effects from human and social capital endowments, the model results show that household welfare is also influenced strongly by the household's demographic characteristics and location. Larger households have lower welfare and there is a life cycle effect of rising household welfare up to age 55. The results also indicate that female-headed households, after controlling for their asset endowments, do not have a lower level of household welfare than male-headed households. Farmer households, on the other hand, do have on average a 23% lower welfare level. Since this variable captures essentially the difference between having

income from agricultural activities and that from wage earnings as main source of income, it indicates that wage jobs yield on average higher incomes.

Lastly, the two provincial dummy variables indicate that households with equal assets and other characteristics will on average have expenditure per capita levels that are 16% lower in Jawa Tengah and 33% lower in NTT than in Jambi. The negative coefficient associated with Jawa Tengah is at first sight surprising since this province has a higher average expenditure level than Jambi. The explanation is that Jawa Tengah has higher levels of human and social capital than Jambi (see Table 1), and after controlling for this difference, a negative location premium remains.

5. Household Welfare, Poverty and Social Capital: Disaggregating the Social Capital Index

While it is certainly a relevant finding that social capital has returns to the household that are similar in magnitude to those from human capital, it provides little guidance as to which aspect of social capital produces this result. In section 3, we discussed six dimensions of social capital which are indicators of the degree of participation in local associational life. The aggregate index used in the previous section was based on three of those dimensions, which were assumed to interact with one another in a multiplicative way. This implies, for example, that heterogeneity or internal functioning may have different effects depending upon the number of associations of which the household is a member.

However, it is also possible to consider that each social capital dimension acts independently, and that the effects are additive. The conceptual literature on social capital is not advanced to the stage that theoretical arguments can be put forth to select one approach over the other. Hence, we test in this section the additive model, whereby the regression results themselves determine the relative weight of each dimension. To that effect, we replace in the model the aggregate social capital index with seven variables capturing the six dimensions of social capital (membership contributions are captured by two variables—cash and work contributions).[19] The regression results suggest that the number of memberships, the internal heterogeneity of the associations,

[19] These variables are the same indicators shown in Table 2, except that we re-scaled the two membership fee variables (in cash and in kind) to an index ranging from 0 to 100 in order to make comparisons easier.

the degree of active participation in decision making and the extent of payment of dues in cash are the most important aspects (Table 5).

Indonesian households on average belong to 5.5 associations. The coefficient of the membership variable indicates that an additional membership is associated with a 1.5% higher household expenditure level. In the context of the model which we discussed in section 3, this is interpreted as the economic return to memberships in local associations.[20] We already alluded to the possibility of reverse causation: high income households could have a higher demand for associational life, perhaps because they have more leisure (although the opportunity cost of their time is also higher). One can certainly argue that associational life has a consumption value and is not sought merely for its economic benefits. Clearly, this is related to the type of association: participating in church choir may have more consumption value than joining the farmers' cooperative. In section 7, we distinguish different types of organizations, and in section 8 we address formally the question of reverse causation with instrumental variables.

[20] There is a close parallel in the interpretation of the coefficients of human and social capital variables. The former represent the return to years of investment in education through school attendance. In the case of social capital, the main input is also time, and the coefficient measures the returns to that time spent in developing networks, attending association meetings, etc. This time can indeed be spread over many years.

Table 5: Household Welfare and Social Capital: Disaggregating the Social Capital Index

Intercept	12.5318	(64.66)
Social Capital Dimensions		
Number of Memberships	0.0146	(2.43)
Heterogeneity Index	0.0031	(3.16)
Meeting Attendance	-0.0020	(0.81)
Index of Participation in Decision Making	0.0025	(4.29)
Cash Contribution Score	0.0113	(1.46)
Work Contribution Score	-0.0008	(0.27)
Community Orientation	0.0000	(0.01)
Household Size	-0.0947	(9.87)
Years of Education	0.0322	(4.22)
Female Head of Household	-0.0303	(0.44)
Age of Head of Household	0.0298	(3.62)
Age of Head of Household Squared	-0.0003	(3.15)
Farmer Household	-0.2182	(5.23)
Jawa Tengah	-0.1686	(3.56)
Nusa Tenggara Timur	-0.3446	(6.17)
Number of Observations	1137	
R-squared	0.25	
F-statistic	21.7	

Notes: 1. Dependent variable = ln (household expenditure per capita).
2. t-statistics are in parentheses and are based on robust standard errors (Hubert-White estimator for non-identically distributed residuals).

Table 5 suggests that the benefits from participating in internally heterogeneous associations are higher than from associations whose members are more alike. The reasons for this may have to do with the exchanges of knowledge and information that occur among members. Members from different backgrounds may learn more from each other because they have different knowledge to start with. A further analysis of heterogeneity (by including each dimension as a separate regressor in the model) supported this conclusion: the economic dimensions of heterogeneity (occupation, economic status and education) matter the most. In other words, associations where members differ in economic attributes yield more benefits to their members than associations where members differ primarily in demographic attributes. Location also matters: benefits are greater if the association brings together people from different

neighborhoods. Differences in location and economic characteristics indeed maximize the chance that association members have different knowledge and hence maximize the potential gain from exchange.

As the literature on social capital has often argued, for local associations to be effective, members must participate actively. Our results suggest that this is not achieved per se by attending meetings (which in Indonesia is often obligatory) but by participating actively in the decision making process. Households that do so are presumably better able to reap the benefits from the associations. The coefficient of this variable is quite large: a 10 point increase in the active participation score (which is a 15% increase) corresponds with a 2.5% higher expenditure level—a larger effect than from adding a membership.

A surprising result is the insignificance of the community orientation variable. This suggests that, for a given degree of active participation, internal heterogeneity, etc., it does not matter whether an association is locally initiated or imposed from the outside. The reason for this could be that community initiation affects household welfare only indirectly, by making active participation more likely. The analysis in section 7 suggests that locally initiated production and social associations are indeed characterized by a higher degree of active participation.

So far, we have provided evidence that social capital, and specifically the dimensions relating to active participation in decision making and internal heterogeneity, have positive effects on household welfare. However, since equation (1) imposes constant parameters over the entire distribution, the results do not say whether social capital helps the poor to the same degree as the rich, and whether investment in social

capital can help escaping from poverty. In this context, it is important to note that the ownership of social capital (as measured by the interactive social capital index) is fairly equally distributed: the social capital index for the richest quintile is only about 30% higher than for the poorest quintile—about the same degree of inequality as for years of education. Physical assets are distributed much more unequally, especially land and household durables (animal ownership is only weakly related to income, and ownership of farm equipment, which is very low overall, declines with income level).

Table 6: Ownership of Assets, by Quintile of Household Expenditure per Capita

	Quintiles					All
	1 (Poorest)	2	3	4	5 (Richest)	
Social Capital Index	14.99	16.65	16.65	18.00	19.89	17.23
Years of Education	4.32	4.64	4.59	5.04	5.65	4.85
Land Ownership (hectares)	1.45	1.28	1.96	3.90	2.52	2.17
Animal Ownership (number)	4.64	3.22	3.42	3.14	4.88	3.86
Farm Equipment Ownership (number)	0.71	0.69	0.67	0.64	0.55	0.65
Household Durables (number)	1.25	1.76	2.13	2.69	3.07	2.18

The question remains however whether this relative accumulation of social capital assets by the poor is rational, in the sense that indeed it helps them escape from poverty or at least provides them with relatively higher returns than other assets. We address this question in several ways. First, we estimate a probit model of the likelihood to be poor.[21] The results indicate that social capital can significantly reduce the probability to be poor (Table 7). The average household with 5.5 memberships has a 7.26 percentage points lower probability to be poor than a household with no memberships. In contrast, a household with an average education level (4.8 years per adult) reduces its probability to be poor by 6.0% relative to a household with no education. This suggests that investing

[21] The poverty line was set at two-thirds of mean household expenditure per capita.

in social capital is a sensible strategy for poor households. Active participation in decision making and memberships in heterogeneous organizations further reduce the likelihood to be poor. The economic dimensions of heterogeneity dominated this result. However, memberships in associations that bring together people from different neighborhoods and kin groups also reduce the probability to be poor.

Quantile regressions are a further way to explore differences between the poor and the rich in the role of social capital. Quantile regressions estimate the regression line through given points on the distribution of the dependent variable (whilst an OLS regression line goes through the mean) and can assess whether certain explanatory factors are weaker or stronger in different parts of the distribution. However, the estimation is conditional upon the values of the independent variables and hence coefficients from quantile regressions are not comparable with those of OLS regressions.[22]

[22] Specifically, the coefficients show the effect of a marginal change in an explanatory variable on the xth conditional quantile of the dependent variable (Buchinsky, 1998).

Table 7: Social Capital and Poverty Outcomes

	Impact on Probability to be Poor (probit)[1/]	
Social Capital Dimensions		
Number of Memberships	-0.0132	(3.21)
Heterogeneity Index	-0.0018	(2.73)
Meeting Attendance	-0.0011	(0.62)
Index of Participation in Decision Making	-0.0017	(4.76)
Cash Contribution Score	0.0041	(0.56)
Work Contribution Score	0.0003	(0.17)
Community Orientation	0.0002	(0.45)
Household Size	0.0419	(7.04)
Years of Education	-0.0126	(2.32)
Female Head of Household	0.0144	(0.32)
Age of Head of Household	-0.0079	(1.51)
Age of Head of Household Squared	0.0000	(1.34)
Farmer Household	0.0567	(1.84)
Jawa Tengah	0.1820	(4.58)
Nusa Tenggara Timur	0.3240	(7.01)
Number of Observations	1137	
Log Likelihood	-461.6	
Chi-squared	164.0	
Probability > Chi-squared	0.00	

Note: 1. Probability derivatives at the mean of each explanatory variable (or for 0 to 1 change for dummy variables) and z-scores based on robust standard errors.

Quantile estimation of equation (1) indicates that the returns to social capital, as measured by the aggregate social capital index, are highest at the bottom of the distribution and gradually decline until the 75th percentile (Table 8). This pattern is primarily influenced by the index of participation in decision making. This suggests that the poorest households in Indonesia benefit the most from high participation in the decision making of associations (and confirms the results of the probit model in Table 7). The effects of membership per se and of heterogeneity are concentrated in the range of the 25th percentile to the median. It is interesting that the cash contribution score is only significant at the 90th percentile, suggesting that the rich "buy" their way into social capital. The pattern of the coefficients of the work contribution score is the exact opposite, suggesting that the poor have to work their way into social capital.

Table 8: Poverty and Social Capital: Quantile Regression Results

	10th percentile	**25th percentile**	**Median**	**75th percentile**	**90th percentile**
Social Capital Index	0.0096*	0.0090*	0.0078*	0.0048*	0.0049*
Number of Memberships	0.0166*	0.0213*	0.0208*	0.0078	0.0106
Heterogeneity Index	0.0018	0.0044*	0.0043*	0.0022	0.0034*
Meeting Attendance	0.0013	-0.0005	-0.0025	-0.0027	-0.0032
Index of Participation in Decision Making	0.0047*	0.0023*	0.0023*	0.0018*	0.0018*
Cash Contribution Score	0.0145	0.0110	0.0117	0.0150	0.0201*
Work Contribution Score	0.0057	0.0025	0.0004	-0.0040	-0.0053
Community Orientation	0.0004	0.0001	0.0002	-0.0003	0.0001
Years of Education	0.0285*	0.0312*	0.0290*	0.0396*	0.0519*
Note: Asterisk (*) indicates that the coefficient is significant at the 90% confidence level.					

The contrast between the pattern of returns to social capital with that of human capital is remarkable: the returns to education get larger as one moves up the distribution and are almost twice as high at the 90th percentile than at the 10th percentile. In terms of relative returns, one can indeed say that social capital is the capital of the poor.

The third and final method we use to investigate differential returns to social capital between the poor and the non-poor is the split-sample approach. However, we cannot simply split the sample at the poverty line, or use a conventional interaction variable between the regressors and the poverty status variable (which is equivalent econometrically), because the latter is endogenous. Indeed, the poverty line is defined in terms of household expenditure per capita—the dependent variable of the model. Hence we need to split the sample on the basis of exogenous assets. In the context of a poor rural area, land holdings is an obvious choice. We split the sample into households below and above the median land holding[23], and estimated equation (1) on each half sample (Table 9). The returns to the aggregate social capital index are slightly higher for households with below-median land holdings. The disaggregated model makes it clear

that this is the result of two partly offsetting effects. Benefits from membership and heterogeneity are larger for households with less land, while benefits from active participation in decision making are higher for well-landed households. [24]

Table 9: Poverty and Social Capital: Split-Sample Results

	Below Median Landholdings	**Above Median Landholdings**
Social Capital Index	0.0067*	0.0059*
Number of Memberships	0.0176*	0.0078
Heterogeneity Index	0.0036*	0.0023
Meeting Attendance	-0.0020	-0.0005
Index of Participation in Decision Making	0.0011*	0.0040*
Cash Contribution Score	0.0057	0.0159
Work Contribution Score	0.0040	-0.0071
Community Orientation	0.0001	0.0004
Note: Asterisk (*) indicates that the coefficient is significantly different from zero at the 90% confidence level.		

On balance, the results of this section indicate that memberships in local associations contribute to higher household welfare levels and to reducing the probability to be poor. The key dimensions are internal heterogeneity and active participation in decision making. Returns to social capital are generally higher for households in the lower half of the distribution, whether by expenditure per capita or land ownership.

[23] Due to widely different absolute levels of land ownership across the three provinces, the split was done within each province using provincial medians.

[24] This last finding appears to be at odds with the results from the quantile regressions. However, there is no close correlation between the distribution of expenditure per capita and the distribution of land.

6. The Effects of Social Capital: Asset Accumulation, Access to Credit, Collective Action

Why are households interested in acquiring social capital by investing time and money in local associations? In Indonesia, the partial answer is that the government created many nationwide associations with mandatory membership. However, Indonesia also has a strong local tradition of mutual help and associational life to support it. The survey questionnaires of the LLI study provide insights into why households join local associations. Only 17% of households cite mandatory memberships as the prime reason. The other responses are about equally divided between the direct impact on the household's livelihood, the impact on the community, and safeguards in case of future emergency or need (Grootaert, 1999).

In this section we investigate some of these processes directly. In a relatively poor rural setting, a prime consideration for households is to build up coping strategies to deal with the risk of income fluctuations. This involves accumulating assets (which can be sold or borrowed against in time of need) or arranging access to credit. In the rural areas that are included in this study, asset accumulation is still at a low level. Out of a list of 15 household durable goods, the average household owned only 2.2 items. Most frequently owned were a radio, a pressure lamp and a bicycle. Improving access to credit and savings is a major reason why Indonesian households join local associations. One-fifth of all memberships are primarily for this purpose, with a stronger concentration in Jawa Tengah which has a tradition of rotating credit and saving associations (Werner, 1998). Many other groups have the provision of credit as a secondary objective.

6.1 Asset Accumulation

To see whether social capital is effective in contributing to asset accumulation, we re-estimated equation (1) with an asset score variable as dependent variable. Since the data do not contain price information, this score was calculated using weights derived from a principal component analysis of the 15 durable goods (Filmer and Pritchett, 1998).[25] The results indicate that the number of memberships is not significant, but that belonging to internally heterogeneous associations and participating actively in them is linked with higher asset ownership (Column 1, Table 10). These are, of course, the same two characteristics of associations which we found important earlier as correlates for current expenditure.

The effects are similar in magnitude as in the case of current expenditure—a 10% increase in the heterogeneity index or in the participation index increases asset ownership by 1.7-2.0%. For comparison, a 10% increase in human capital endowment corresponds to a 4.6% higher asset ownership. In other words, while social capital plays a positive role in asset accumulation by the household, its importance relative to education is less than was the case for current expenditure.

[25] We also used equal weights and weights which reflected the relative scarcity of ownership of the item. This did not substantively alter the findings.

Table 10: Social Capital and Asset Accumulation

	Asset Ownership[1/]		Increasing Savings[2/]	
Intercept	-0.1972	(1.26)	—	—
Social Capital Dimensions				
Number of Memberships	0.0023	(0.50)	0.0101	(2.86)
Membership in Financial Associations	—	—	0.0594	(2.13)
Heterogeneity Index	0.0018	(2.23)	0.0002	(0.31)
Meeting Attendance	0.0002	(0.08)	-0.0044	(1.85)
Index of Participation in Decision Making	0.0018	(4.30)	0.0003	(0.80)
Cash Contribution Score	-0.0025	(0.44)	0.0009	(0.21)
Work Contribution Score	0.0007	(0.38)	-0.0019	(1.09)
Community Orientation	-0.0006	(0.93)	-0.0007	(1.49)
Household Size	0.0243	(3.61)	-0.0009	(0.18)
Years of Education	0.0527	(7.83)	-0.0024	(0.50)
Asset Score	—	—	0.0497	(2.22)
Female Head of Household	-0.0909	(1.87)	0.0231	(0.59)
Age of Head of Household	0.0280	(4.28)	-0.0057	(1.13)
Age of Head of Household Squared	-0.0002	(3.42)	0.0000	(0.81)
Farmer Household	-0.3116	(7.74)	-0.0631	(2.21)
Jawa Tengah	-0.2092	(4.72)	0.2267	(5.13)
Nusa Tenggara Timur	-0.6212	(13.37)	0.1161	(2.70)
Number of Observations	1137		1137	
R-squared	0.37		—	
F-statistic	46.8		—	
Log Likelihood	—		-430.3	
Chi-squared	—		140.7	
Probability > Chi-squared	—		0.00	

Notes: 1. OLS model with asset score (principal component weights) as dependent variable; reported are coefficients and t-values based on robust standard errors.
2. Probit model of households who increased savings in the past year; reported are probability derivatives at the mean of the explanatory variables (or for 0 to 1 change in the case of dummy variables) and z-scores based on robust standard errors.

Another aspect of asset accumulation is the ability to have savings. While the LLI questionnaire did not record the amount of savings, it did ask whether households had been able to increase savings in the past year. Households with more memberships in local associations were significantly more able to do so than others (Column 2, Table 10). The effect was especially strong from memberships in credit and savings associations indicating that such organizations do in fact achieve their professed objective. The initial wealth position of the household also mattered, as richer

households were significantly more likely to increase their savings. This underscores of course the importance of credit and savings associations for the poor.

6.2 Access to Credit

Table 11 confirms the importance of financial associations for access to credit: members were 13 percentage points more likely to obtain credit than non-members and the obtained credit amounts were much larger. However, Table 11 also makes it clear that membership and active participation in other local associations, whose prime objective is not financial, also contributes to access to credit. This is perhaps the sense in which social capital is truly "social," in that the building of networks and trust among members in the context of a social setting spills over into financial benefits, e.g. by easier access to credit. This interpretation of social capital has been proposed by several authors such as Putnam (1993), Dasgupta (1988) and Fukuyama (1995). Sharma and Zeller (1997) report that the number of self-help groups in communities in Bangladesh has a positive spillover effect on the performance of credit groups. Similar spillovers have been documented in other sectors as well. Kähkönen (1999) reports that community action to set up water delivery systems is aided by the existence of other non-water related networks and associations in the community.

The results also indicate that internal heterogeneity of associations improved access to credit. The key dimensions which contribute to this effect are gender and education. In other words, the spillover effect is strongest in associations whose members consisted of both men and women and who have a mixed educational background.

This leaves open the question whether heterogeneity within credit and saving associations is a positive factor. The theoretical models suggest that homogeneity of members is preferred because it reduces information asymmetries and may make it easier to employ social sanctions against default (Stiglitz, 1990; Devereux and Fishe, 1993; Besley and Coate, 1995). Gender separation is traditional in Indonesia in the area of credit provision and the majority of traditional credit and saving associations (arisan) are segregated by gender, especially in Jawa Tengah (Werner, 1998; Grootaert, 1999). This is in fact part of the conventional wisdom in the provision of group-based credit, not just in Indonesia. For example, the Grameen Bank also insists that its borrowing circles consists only of women (Yunus, 1997).

However, when we re-estimate the models in Table 11 by adding an index capturing heterogeneity within credit and saving associations, the coefficient of the latter is positive and significant. This means that both the probability to obtain credit and the loan amounts received are higher for members of differentiated credit and savings associations than for members of homogeneous ones. While this is an important finding in terms of how to best organize financial local associations, it has to be remembered that access to credit and amounts received is only part of the story. We have no data on repayment records and hence it remains to be investigated whether heterogeneity is also a positive factor for this aspect. Evidence form Bangladesh and Madagascar suggests that economic heterogeneity in the group (especially different income sources) improves repayment rates because of the group's better ability to pool risk. The effects of social homogeneity (gender, kinship) are mixed however (Sharma and Zeller, 1997; Zeller, 1998).

Table 11: Social Capital and Access to Credit

	Access to Credit (probit)[1/]		Ln (Amount of Credit Received) (tobit)[2/]	
Intercept	—		-1.7076	(0.58)
Social Capital Dimensions				
Number of Memberships	0.0107	(1.85)	0.2089	(2.24)
Membership in Financial Associations	0.1314	(3.04)	2.2912	(3.23)
Heterogeneity Index	0.0016	(1.73)	0.0311	(2.05)
Meeting Attendance	0.0006	(0.24)	0.0235	(0.60)
Index of Participation in Decision Making	0.0011	(2.09)	0.0188	(2.28)
Cash Contribution Score	-0.0087	(1.16)	-0.1167	(0.84)
Work Contribution Score	-0.0046	(1.53)	-0.0801	(1.62)
Community Orientation	-0.0007	(1.09)	-0.0191	(1.77)
Household Size	0.0117	(1.53)	0.2344	(1.86)
Years of Education	-0.0081	(1.11)	-0.0611	(0.51)
Asset Score	-0.0194	(0.59)	0.2470	(0.46)
Female Head of Household	-0.0393	(0.69)	-0.5672	(0.60)
Age of Head of Household	0.0140	(1.91)	0.2650	(2.14)
Age of Head of Household Squared	-0.0002	(2.22)	-0.0031	(2.45)
Farmer Household	-0.0901	(2.21)	-1.7394	(2.63)
Jawa Tengah	0.0470	(0.87)	-0.0080	(0.01)
Nusa Tenggara Timur	-0.2326	(4.21)	-4.1669	(4.52)
Number of Observations	1137		1137	
Log Likelihood	-686.7		-2784.3	
Chi-squared	138.0		163.7	
Probability > Chi-squared	0.00		0.00	

Notes: 1. Probability derivatives at the mean of each explanatory variable (or for 0 to 1 change in the case of dummy variables) and z-scores based on robust standard errors.
2. Tobit coefficients and t-statistics.

6.3 Collective Action

In addition to contributing to asset accumulation and access to credit, social capital has also been documented to aid in collective action and collective decision making. This is especially relevant in rural settings where common property resources, such as water, forestry or grazing land, need to be managed by a community (Narayan, 1995; Uphoff, 1992). In Indonesia, there is a strong tradition of mutual help and quite a few of the local associations inventoried by the LLI study were set up for that specific

purpose. This tradition manifests itself also in collective action (gotong ryong), often undertaken for the purpose of constructing or maintaining local infrastructure.

We regressed the number of times per year households participate in collective action against the social capital variables and the usual control variables (Table 12). Households who are members of more associations are more likely to participate in collective action. This attests again to the "social" nature of social capital—networks and interactions engaged in as part of social, religious, financial, or other objectives spill over into higher participation in activities which benefit the community at large. However, two results are distinctly different from what we found so far. We have noted that membership in internally heterogeneous organizations provides the greatest benefits to the household, whether in terms of overall welfare, or access to credit or savings. In the case of collective action, the opposite result obtains: the highest participation in collective action comes from members of internally more homogeneous organizations.

Further analysis indicated that kin group and religion are the key dimensions, i.e. collective action is easiest organized in associations which brings together people from within the same kin group and/or religion. The importance of these factors has been documented elsewhere. Kähkönen (1999) reports that homogeneity of kinship, caste and ethnic background aids collective action for water supply. The role of these socio-demographic factors is a noteworthy contrast with the role of the economic factors such as education, occupation and economic status which were the key contributing factors to increased household welfare. Clearly, a different mechanism is at work. The benefits to household welfare come primarily from exchanges in knowledge, while the ability to organize collective action is more a function of trust and a shared perception of a

common good. It stands to reason that this is more readily achieved among people who are kin or share religious convictions.

Table 12: Social Capital and Collective Action

	Collective Action[1/]			
	Household		**Village**	
Intercept	-11.6570	(1.41)	-43.5740	(0.29)
Social Capital Dimensions				
Number of Memberships	1.2831	(4.01)	0.0332	(0.02)
Heterogeneity Index	-0.1063	(2.42)	-0.1288	(0.44)
Meeting Attendance	-0.0358	(0.28)	-1.2797	(1.02)
Index of Participation in Decision Making	0.0172	(0.63)	0.0473	(0.21)
Cash Contribution Score	0.0135	(0.02)	-1.8735	(0.44)
Work Contribution Score	1.2161	(4.65)	4.4582	(3.60)
Community Orientation	0.0537	(1.54)	0.1190	(0.45)
Household Size	0.6247	(1.62)	7.0000	(1.54)
Years of Education	0.0231	(0.07)	-1.8229	(0.55)
Asset Score	-5.3349	(3.17)	-13.9125	(0.94)
Coefficient of Variation Expenditure	—	—	-0.0632	(0.59)
Female Head of Household	-5.7515	(1.45)	21.3046	(0.47)
Age of Head of Household	0.8233	(2.28)	1.9153	(0.30)
Age of Head of Household Squared	-0.0096	(2.67)	-0.0211	(0.31)
Farmer Household	8.9465	(4.70)	14.6116	(0.76)
Jawa Tengah	15.1462	(7.00)	16.1773	(1.21)
Nusa Tenggara Timur	1.1588	(0.43)	-30.0477	(1.68)
Number of Observations	1137		48	
R-squared	0.18		0.65	
F-statistic	17.9		8.6	

Notes: 1. Dependent variable is the number of times the household participated in collective action (gotong ryong) during the last year. Reported are OLS coefficients and t-statistics based on robust standard errors.

The second different finding is that households which provide in-kind contributions (i.e. through working) to their associations are more likely to participate in collective action. In our previous results, the nature and amount of membership dues was not found to have a significant effect. Since in-kind contributions occur almost solely in NTT, this result reflects primarily a cultural factor of this province.

The last noteworthy observation from the collective action regression is that wealthier households participate less in collective action.

Given that by nature collective action is organized at the level of a community, we also estimated the collective action regression using the village as unit of observation. Although the regression has a fairly high R-squared, most variables are imprecisely estimated due to the small number of observations. It appears that villages with a high density of associations are not necessarily better able to organize collective action. On the other hand, villages where there is a tradition of paying membership dues in kind are more successful in organizing collective action.

6.4 Household versus Village Effects

Narayan and Pritchett (1997) addressed the question whether the social capital effects which they observed in Tanzania operate at the household or the village level. They tested this by constructing village averages of their household-level variables and estimating the model using the village as the unit of observation Their results suggest that the social capital effect in Tanzania is primarily village-based. We undertook a similar exercise for Indonesia The resulting village-level regression as a whole was barely significant and the majority of variables, including the social capital index, were not significant. The could be result of the fact that the number of observations (48 villages) is too small to estimate this regression, but it could also reflect that the extent of variation that exists across villages is less in Indonesia that is the case in Tanzania. We also undertook a further experiment by including in the household-level regression both the household's index of social capital and the village average. The household variable retained its significant and the village variable did not have a significant coefficient.

These results suggest that households benefit from local associations because of their direct participation in the association's activities and that this is independent from the overall amount of social capital in the village.

This conclusion, however, needs to be treated with caution because of the possibility of omitted-variable bias, in case the regression does not control for all relevant factors. We try to tackle this question in two ways. As a first approach, we added to the basic specification of Table 5 a dummy variable for each village (minus one omitted village), under the assumption that these variables capture all omitted relevant village factors. This raises the R-squared from 0.25 to only 0.32, suggesting that the amount of possible omitted-variable bias is fairly limited. More importantly, it changes the coefficients of the social capital variables only very slightly and leaves their significance pattern unaffected. This suggests that our finding of significant social capital effects at the household level is not the result of omitted variables which could capture the social capital effects at the village level.

A second and more interesting approach is to include information on the village's past community activities. Our village data files include information on the major development projects which were undertaken in the sample villages over the past 10 years, and whether the community was actively involved in the design, funding and implementation of the project. On that basis, we constructed an index of past community involvement for each village (ranging from 0 to 3), and added this variable to the basic model. This index was much higher in the richest ten villages (1.62) than in the poorest ten villages (1.37). We also included a set of village-level control variables pertaining to the village's location (upland/lowland, distance to nearest market city), and internal

ethnic and religious homogeneity. Most importantly, we also control for the number of development projects which the village undertook.

The results in Table 13 indicate that past community action is positively correlated with current incomes. The inclusion of this variable, again, changes the coefficients of the household-level social capital variables only slightly and does not alter their significance pattern. We feel comfortable to conclude that, in the case of Indonesia, social capital effects operate primarily at the household level, but that past community activity (which presumably built social capital) exerts a supplementary effect. We underline that the regression controls for the number of development projects and hence the past-community-involvement variable does not measure the impact of these projects on income. It only measures the additional benefit from the community's active involvement in the projects.[26] This could reflect the fact that projects with high beneficiary participation are more effective (Isham, Narayan and Pritchett, 1995). This finding is also in line with the position of Putnam (1993) that it is the history of civic engagement which explains differences in the economic performance of communities (although it appears that one does not necessarily have to go back in time several centuries, as Putnam did in his study of Italy).

[26] The variable measuring the community's past involvement is negatively correlated (r = -0.25) with the number of projects.

Table 13: Social Capital and Household Welfare: Household versus Village Effects

Intercept	12.2974	(57.42)
Social Capital Dimensions		
Number of Memberships	0.0116	(1.78)
Heterogeneity Index	0.0030	(2.94)
Meeting Attendance	-0.0018	(0.74)
Index of Participation in Decision Making	0.0025	(4.35)
Cash Contribution Score	0.0080	(1.10)
Work Contribution Score	-0.0009	(0.28)
Community Orientation	-0.0002	(0.22)
Household Size	-0.0949	(10.07)
Years of Education	0.0319	(4.11)
Female Head of Household	-0.0432	(0.63)
Age of Head of Household	0.0314	(3.82)
Age of Head of Household Squared	-0.0003	(3.38)
Farmer Household	-0.2206	(5.17)
Jawa Tengah	-0.2348	(3.79)
Nusa Tenggara Timur	-0.3151	(5.09)
Village Variables		
Past Community Involvement in Development Projects	0.1370	(2.47)
Number of Projects	0.0038	(1.27)
Upland villages	0.0203	(0.51)
Distance to Market (km)	-0.0045	(1.33)
Diversity	0.0199	(0.49)
Number of Observations	1137	
R-squared	0.25	
F-statistic	16.93	

Notes: Dependent variables is ln (household expenditure per capita). Reported are OLS coefficients and t-statistics based on robust standard errors.

6.5 Conclusion

In this section we attempted to get a step closer to the structural equations which underlie the reduced-form model of equation (1), by estimating the impact of social capital on variables portraying the ways in which social capital contributes to household welfare. We found that households with high social capital are better able to accumulate physical assets and savings and to obtain credit. This should help households cope better with the risk of income fluctuations. The number of memberships, the internal heterogeneity of associations, and active participation in decision making were the key dimensions. In contrast, when it comes to collective action, households belonging to

homogeneous associations are more likely to participate. We suggest that different mechanisms are at work. The benefits to household welfare are primarily the result of exchanges in knowledge, which are maximized among association members of different economic backgrounds. Collective action requires in the first place a shared perception of the common good which is easier to achieve among people of the same kin or religion.

We argued that there are two ways in which social capital is truly "social." First, there are spillover effects from social interaction undertaken in one sphere (e.g. social, religion, cultural) into other spheres, leading to improved access to financial and other resources. In order to capture these effects the household must engage itself actively in local associational life. A dense network of associations will not necessarily lead to economic benefits to non-members, at least not in the short run.

Second, we identified two mechanisms whereby spillover effects do reach the community at large. Collective action occurs more frequently in communities with high levels of social capital, and past community action for development projects benefits households regardless of whether they currently are active in the community.

7. Household Welfare and Social Capital: Distinguishing Types of Associations

The social capital dimensions which we have discussed so far are embodied in a wide variety of local institutions in Indonesia. Different types of associations are likely to display the six dimensions in differing degrees and they may therefore not contribute to the effects we have found so far in the same extent.

A key feature of the Indonesian institutional landscape is the active role which the central government played in promoting and shaping local associations and their interactions with different levels of government. It is logical therefore that in categorizing local associations we focus first on whether they are government sponsored and/or national in scope. Such associations include the formal Village Development Councils (LKMD) and Village Deliberation Councils (LMD) set up to involve people in local government, the national association of farmers (Kelompok Tani) and the Posyandu which aim to promote the health of children and pregnant or feeding mothers. The average household in our sample is a member of 2.6 government/national associations and this constitutes almost half of all memberships (Table 14).

The second category consists of religious groups and organizations, which figured prominently in the inventory of associations. Three of the ten local associations cited most frequently by households as the most important groups in their life are religious in nature: Pengajian (a Koran recital group), Rayon (an organization of the Protestant church for church maintenance and ministerial support) and Kelompok Doa (a Catholic

prayer group). In total, memberships in religious organizations account for 18% of all memberships.

Table 14: Social Capital Dimensions, by Type of Association

	Government/ National Groups	Religious Groups	Production Groups	Social Groups
Number of Memberships	2.6	1.0	1.1	0.8
Index of Heterogeneity	56.2	54.5	49.1	52.8
Meeting Attendance	2.7	14.5	4.9	4.2
Index of Participation in Decision Making	60.2	68.0	67.7	73.8
Cash Contribution Score	0.27	0.60	1.40	0.46
Work Contribution Score	2.76	4.21	2.04	2.93
Community Orientation	3.6	99.9	92.1	99.2
Notes: For definitions of categories of associations, see text.				

This leaves as third category the genuine grassroots associations which focus on local problems and are almost entirely community-initiated. They consist of course of a very wide array of different groups and cover many objectives. To keep the analysis manageable (and keeping in mind the limited sample size of the data set), we split this category in production associations and social associations. The former aim primarily to generate direct economic benefits for their members and the latter do not. Production associations include various professional groups as well as credit and savings associations. Social groups pursue health and education benefits, mutual support for ceremonies or recreation purposes.[27]

[27] This classification scheme is hierarchical, whereby the government/national designation takes precedence over the functional attribution. For example, among financial associations, the groups of the government-sponsored anti-poverty program (IDT) are classified as government/national associations while the Arisan Dusun (neighborhood-based rotating savings groups) are classified under production groups. This is done in order to leave the production and social groups as purely grassroots as possible. We did experiment with the reverse scheme, whereby the functional attribution took precedence, but found that this classification had less explanatory power.

Government/national associations have the highest level of internal heterogeneity and production groups are the most homogeneous, but the distinction is not very pronounced (Table 14). Not surprisingly, meetings of the government/national associations are least well attended and those of religious groups the most. Active participation in decision making is also the lowest in government/national groups and highest in social groups. Membership dues also vary significantly across the categories: government/national associations have the lowest requirements and religious groups the highest. Production groups require the highest cash contributions. The final social capital dimension, community orientation is, by definition, close to zero for government/national groups and close to 100 for the other categories. Annex tables A1 to A7 further break down the social capital dimensions according to type of association and household characteristics.[28]

In order to test how the importance of each social capital dimension varies with type of institution, we split each of the seven social capital variables in the basic model specification (Table 5) into four variables, by type of association. This presents a problem for the heterogeneity index, the index of active participation in decision making and the two membership dues variables, because this information is only available for the three associations which the household listed as most important. Hence, if a household did not list, e.g., a social association among its most important groups, four of the seven social capital variables were missing for that category. To address this, a series of missing value dummy variables were created and added to the specification.

[28] For a further discussion of the types of local associations in Indonesia and the patterns of membership see Werner (1998) and Grootaert (1999).

The coefficients of the resulting 28 social capital variables are reported in Table 15. They indicate that the number of memberships is a significant variable only in the case of voluntary production and social associations. The largest effect—one membership adds 6.2% to household expenditure per capita—comes from social groups, which, it will be recalled, are not set up to pursue primarily economic objectives. This lends support to the view that the economic benefits of social capital are an externality to the pursuit of social interaction and the resulting build-up of trust. One is reminded of the famous choral societies and bowling leagues discussed by Putnam (1993, 1995). Given the efforts which the Indonesian government has put in the creation of a nation-wide network of local associations, it is sobering to note that memberships in these government-sponsored groups has no measurable effect on the welfare level of households.[29] Of course, the government had also other objectives in mind when establishing these local associations (see e.g. Evers, 1998; Werner, 1998).

[29] There is a silver lining to this finding. The recent crisis in Indonesia, and the change in government, will likely lead to a weakening of the network of government-supported local associations. Our results suggest that this may not contribute to lowering the welfare level of households. Furthermore, the voluntary production and social associations could well take over some of the functions previously handled through government-sponsored associations, which would be to the benefit of households. It has been observed before in Indonesia, that in areas where government associations are weak, voluntary associations step in to fill the void (Werner, 1997).

Table 15: Household Welfare and Social Capital: Distinguishing Types of Associations

	Government/ National Groups		Religious Groups		Production Groups		Social Groups	
Number of Memberships	0.0084	(0.73)	-0.0223	(0.79)	0.0428	(1.94)	0.0623	(2.39)
Heterogeneity Index	0.0005	(0.41)	0.0016	(1.32)	0.0028	(1.78)	0.0014	(1.13)
Meeting Attendance	-0.0122	(1.58)	-0.0008	(0.61)	0.0060	(1.41)	0.0017	(0.92)
Index of Participation in Decision Making	0.0023	(3.30)	0.0007	(0.94)	0.0009	(1.14)	0.0013	(1.38)
Cash Contribution Score	0.0278	(1.87)	0.0136	(1.79)	-0.0008	(0.11)	-0.0193	(2.20)
Work Contribution Score	0.0040	(1.34)	-0.0030	(0.97)	-0.0035	(1.38)	-0.0095	(1.85)
Community Orientation	-0.0006	(0.41)	0.0007	(1.09)	-0.0012	(2.19)	-0.0005	(0.88)

Note: 1. Dependent variable = ln (household expenditure per capita).
2. Entries are coefficients and robust t-statistics from OLS regression with social capital variables broken down by type of association (i.e. 7 x 4 regressors) and the usual set of control variables.

Our earlier results pointed repeatedly at the importance of an association's internal heterogeneity. It turns out that this is most important for production groups. Such groups rely perhaps more than others on sharing information and knowledge and a more heterogeneous membership base may lead to a wider pool of knowledge to be shared. In contrast, the index of active participation in decision making is found to be most significant for government/national groups. Since memberships in most of these groups is mandatory, it suggests that benefits accrue most to those who take an active role. This is confirmed by the positive coefficient of cash contribution.

The negative coefficients of the cash and work contribution variables are a puzzling result at first sight. However, the detailed annex tables reveal that the poorest households participate more actively in social groups, including making larger contributions in cash and in kind. This clearly brings out the importance which the poor attach to these organizations. Presumably, the rich have less need to associate in groups for education or health's sake since they can afford to buy these services. Likewise, the rich have less need than the poor to get together for mutual support in making affordable ceremonies or house construction (frequent objectives of social associations).

8. Social Capital and Household Welfare: Two-Way Causality?

The model underlying this paper and presented in section 4 took the fundamental position that social capital is an input in the household's production function and can be modeled similar to human capital and other household asset endowments. However, like human capital, social capital can be, at least partly, a consumption good. This is certainly possible in case of participation in non-mandatory social groups pursuing leisure activities. Since leisure is usually a luxury good, demand for it will rise with income, and then there could be a reverse causality from welfare level to social capital. If so, the estimated coefficient of social capital in equation (1) is upward biased.

The strongest evidence in support of a causation from social capital to income was presented in section 6 which estimated structural equations indicating the positive role of social capital in access to credit. Similarly, Narayan and Pritchett (1997) and Isham (1998) have documented the role of social capital in obtaining access to agricultural inputs such as fertilizer.

However, the extent of two-way causality is empirically testable by means of instrumental variable estimation. The real challenge is to find a suitable instrument set for social capital: instruments must determine social capital but not household welfare (nor be determined by household welfare). In order to make this task more feasible, we return to the aggregate model of section 4, which uses a single social capital index. We argue that the following are conceptually suitable instruments for social capital:

(1) *Ethnic and religious diversity of the village*. This affects directly the potential heterogeneity of associations, which is one of the components of

the aggregate social capital index. If there is only one religious group in the village, it is not possible to have a religiously heterogeneous association. There is also no reason to assume that ethnic or religious composition would directly affect household income, nor, obviously, will income affect diversity.[30]

(2) *The density and effectiveness of institutions in the village*. Clearly, the possibility for a given household to join an association increases as more associations exist in the village. The likelihood to join and to be active in the association can also be expected to increase as institutions are perceived to be effective. As we have already demonstrated earlier, the density of associations at the village level does not significantly affect the level of household expenditure directly.

(3) *The village's involvement in the procurement of social services and infrastructure*. Such involvement is likely to incite people to join associations dealing with education, health, roads or other infrastructure. It does not however have a direct effect on household income (which stems from the <u>use</u> of such services or infrastructure).

Given the content of the available village data file, this leads to eight possible instruments: an index of ethnic and religious diversity, the number of existing associations in the village, the percent of institutions deemed effective, and indexes of

[30] This position is not inconsistent with the possibility that ethnic diversity may affect economic growth at the national level (as has been demonstrated for Africa by Easterly and Levine, 1995 and Collier, 1998a).

community involvement in the provision of health and education services, water supply, road maintenance and irrigation.[31]

We added those 8 variables to equation (1) and found that none were significant. Hence they meet the first criterion for being a valid instrument, namely not affecting household welfare. To test the second criterion, we applied the test for over-identifying restrictions proposed by Davindson and Mackinnon (1993). This tests the joint null hypothesis that the underlying model (equation (1)) is correctly specified and that the applied instruments are valid. (The latter hypothesis cannot be tested separately). Table 16 reports the test-statistic's p-value as well as the coefficient and t-statistic of the social capital index in the 2SLS equation. To check for the sensitivity of results to specific instrument selection, we tested several combinations of the instruments. All combinations lead to significant increases in R-squared in the first stage equation, and pass the over-identifying restrictions test.

In all cases, the instrumental variables method leads to higher coefficients (ranging from 0.0087 to 0.0122) for the social capital index than in the OLS model (where it was 0.0069). This indicates that equation (1) is correctly specified and that social capital is an exogenous determinant of household welfare. If there were significant reverse causality, the coefficient of the social capital index in the 2SLS regression would have been lower than the OLS coefficient. The finding of exogeneity of the social capital index was also reported by Narayan and Pritchett (1997) for Tanzania. The higher coefficient of the instrumented social capital index implies that a 10% increase in the

[31] It is important to point out that these variables were collected independently of the household data, by means of interviews with village leaders, teachers, health professionals, etc., and also with focus groups of households who did not answer the household questionnaire.

household's social capital endowment leads to a 1.5% to 2.1% increase in household expenditure per capita—which is in the same range as the effect from a similar increase in the human capital endowment.

Table 16: Social Capital and Household Welfare: Instrumental Variables Results

Instrument Set	Social Capital Index		Incremental R-squared	OIR Test p-value
	Coefficient	t-statistic		
1. Diversity, institutional effectiveness	0.0109	2.06	0.033	0.39
2. Diversity, institutional effectiveness, institutional density	0.0087	2.19	0.059	0.56
3. Diversity, institutional effectiveness, community involvement in health, education, water supply, roads, irrigation	0.0122	2.59	0.043	0.64
4. Diversity, institutional effectiveness, institutional density, community involvement in health, education, water supply, roads, irrigation	0.0098	2.49	0.061	0.63

This finding strengthens the case for viewing social capital as an input in the household's production function. This in turn opens up the case for investing in social capital, just as investments are made in human capital. However, there is a critical difference: education is embodied in one individual and can be acquired by one individual regardless of what other people do. By definition, social capital can only be acquired by a group of people and requires a form of cooperation among them (although, as our results have shown, the extent to which different members of a group capture the benefits does depend upon their individual actions, especially the extent of active participation). This gives social capital an inevitable public good character and this has implications for its production (Coleman, 1988, 1990). In particular, like all public goods, it will tend to be underproduced relative to the social optimum, unless the group responsible for its production can fully internalize the externality involved (Collier,

1998). Which group is best suited to producing social capital thus depends largely on the scope of the created externality and this determines the size of the group needed to internalize it effectively and avoid free rides. For example, in the case of rotating savings association, the scope is local; in the case of the rule of law, it is national and the central government needs to play the essential role.

To the extent that a population with high levels of social interaction, trust, and abiding by norms and laws generates country-wide benefits, it may justify a role for government. This role would not necessarily consist of setting up a series of government-sponsored associations (as the Indonesian government did), but primarily in creating a supportive environment for the emergence of voluntary local associations. Our results suggest indeed that the returns to members are larger from voluntary associations. The government, especially local government, could equally play a role in ensuring that the poor participate in local associations. Our results indicate that the benefits from membership and active participation are greater for the poor than for the population at large.

9. Summary and Conclusion

In this paper we estimated empirically the impact of social capital on household welfare and poverty in the case of Indonesia. The focus was on households' memberships in local associations—an aspect of social capital which is particularly relevant for households' day-to-day decisions affecting their welfare and consumption. The basic data indicated a positive correlation between social capital and household welfare: households with high social capital have higher expenditure per capita, more assets, higher savings and better access to credit.

We used a reduced-form model of household welfare, which controls for relevant household and location characteristics, to estimate the contribution of social capital to household welfare. The underlying structural equations treat social capital as an input, together with human and physical capital, in the household's production function. The effects of social capital operate through (at least) three mechanisms: sharing of information among association members, reduction of opportunistic behavior, and improved collective decision making. The magnitude of the social capital effect was found to be similar to that of human capital. Increasing the average endowment of education for each adult in the household by one year (which is about a 20% increase) would increase household expenditure per capita by 3.4%. A similar increase in social capital endowment would increase household expenditure per capita by 2.3%.

We measured social capital along six dimensions: density of memberships, internal heterogeneity of associations (by gender, age, education, religion, etc.), meeting attendance, active participation in decision making, payment of dues (in cash and through

work), and community orientation. Among these, the strongest effects were found to come from:

(i) the number of memberships: each additional membership (which is a 20% increase in memberships, on average) raises household expenditure per capita by 1.5%;

(ii) internal heterogeneity: an increase of 20% in the heterogeneity index correlates with a 3.3% higher expenditure level;

(iii) active participation in decision making: an increase of 20% in the participation index correlates with a 3.2% higher expenditure level.

In heterogeneous associations the potential pool of knowledge to be shared is larger and hence the potential benefit to members is higher. We found indeed that heterogeneity along dimensions such as education, occupation and economic status (which are likely to correspond to differing knowledge) confers the greatest benefits.

Social capital reduces the probability of being poor and the returns to household investment in social capital are higher for the poor than for the population at large. This is especially the case for the number of memberships and households' active participation in decision making. This underscores the potential pay-off to poor households from investing more time in creating social capital by participating actively in local associations. We found that at low income levels the returns to social capital exceed those of human capital, while the reverse is true at the upper end of the distribution.

Social capital is hypothesized to have several long-term benefits, such as better access to credit and a resulting better ability to smoothen out income fluctuations by borrowing and/or accumulating assets. Our empirical results confirm the validity of these propositions and highlight again that the internal heterogeneity of an association and its members' active participation in decision making are the key factors. Membership in associations whose primary role is financial (e.g. rotating credit and savings associations) has a strong positive effect.

The effects of social capital are not the same for each type of association. We distinguished government-inspired nation-wide associations with mostly mandatory membership from community-initiated ones with mostly voluntary membership. The latter were broken down into religious, production and social associations. Memberships in production and social associations have the largest impact on household welfare—these effects are 4-6 times larger than those from memberships in government-sponsored associations. However, when households participate actively in the decision making process of government groups, the benefits to the household rise significantly.

Social capital affects household welfare but there can also be reverse causality: richer households could have a higher demand for memberships in associations and have more time to participate (although the opportunity cost of their time is also higher). Instrumental variable estimation suggested that the direct effect of social capital on welfare dominates the reverse effect in explaining the correlation between the two variables. This finding is robust for several sets of instruments available in the data.

On balance, this study for Indonesia found compelling empirical evidence that local social capital—defined as household membership in local associations—makes a

significant contribution to household welfare, over and above that stemming from human capital and other household assets. The use of household-level data to make this case and to quantify the impact of social capital is novel in the literature on social capital. To our knowledge, this is also the first study which quantifies the effects of different dimensions of social capital and of different types of associations.

Our findings support a policy by donors and governments to invest in social capital—either directly or by creating an environment friendly to the emergence of local associations. Our findings also indicate that investments in local social capital deserve to be part of poverty alleviation programs since the returns to investment in social capital are larger for the poor than for others. Lastly, our findings provide indications of the type of associations which are likely to impart the largest benefits.

Future research on other countries will have to confirm the findings of the Indonesia case study. Similar work to that reported in this paper is currently ongoing for Bolivia and Burkina Faso (World Bank, 1998). Further work on estimating directly the structural equations which portray the effects of social capital on access to credit or other inputs, on smoothening income fluctuations and on group decision making would further add to the case for treating social capital as genuine "capital" in the household's production function.

Annex: Detailed Tables on Social Capital Dimensions

Table A1: Membership in Local Associations, by Region and Household Characteristics and by Type of Association.

Table A2: Heterogeneity Index of Local Associations, by Region and Household Characteristics and by Type of Association.

Table A3: Meeting Attendance in Local Associations, by Region and Household Characteristics and by Type of Association.

Table A4: Index of Active Participation in Decision Making in Local Associations, by Region and Household Characteristics and by Type of Association.

Table A5: Cash Contribution Score, by Region and Household Characteristics and by Type of Association.

Table A6: Work Contribution Score, by Region and Household Characteristics and by Type of Association.

Table A7: Community Orientation, by Region and Household Characteristics and by Type of Association.

Table A8: Composition of Households' Three Most Important Groups, by Region and Household Characteristics.

Table A9: Means and Standard Deviations of Regression Variables.

Table A1: Membership in Local Associations, by Region and Household Characteristics and by Type of Association

	Government/ National Groups	Religious Groups	Production Groups	Social Groups
Province				
Jambi	1.3	1.0	0.6	0.8
Jawa Tengah	3.2	0.7	1.9	0.2
NTT	3.3	1.3	0.6	1.3
Head of Household				
Male	2.7	1.0	1.1	0.8
Female	1.9	1.0	1.0	0.8
Religion				
Muslim	2.3	0.8	1.3	0.5
Catholic	3.8	1.7	1.0	1.8
Protestant	2.8	1.0	0.2	0.7
Education				
None	2.1	0.8	1.0	0.6
Primary School — Incomplete	2.4	1.0	1.1	0.7
Primary School — Complete	2.7	1.1	1.1	0.8
Secondary School — Incomplete	3.2	0.9	1.1	0.9
Secondary School — Complete	3.6	1.2	1.0	0.8
Vocational	2.4	0.8	0.8	0.7
University/Other	4.6	1.2	1.3	1.2
Quintile				
Poorest	2.7	1.1	0.9	0.8
2	2.5	1.1	1.1	0.8
3	2.5	1.0	1.1	0.8
4	2.6	1.0	1.0	0.7
Richest	2.8	0.9	1.2	0.7
All	2.6	1.0	1.1	0.8

Note: For definition of categories, see text.

Table A2: Heterogeneity Index of Local Associations, by Region and Household Characteristics and by Type of Association

	Government/ National Groups	Religious Groups	Production Groups	Social Groups
Province				
Jambi	43.3	35.0	34.5	46.7
Jawa Tengah	57.0	65.2	54.5	62.5
NTT	62.6	66.0	57.8	56.9
Head of Household				
Male	56.2	55.0	48.9	53.4
Female	55.4	48.4	51.0	47.5
Religion				
Muslim	52.2	45.9	46.7	49.4
Catholic	60.1	63.5	57.3	53.6
Protestant	63.7	68.6	57.4	61.7
Education				
None	54.1	54.8	47.5	57.5
Primary School — Incomplete	54.3	54.2	48.8	50.6
Primary School — Complete	56.3	53.1	48.1	50.5
Secondary School — Incomplete	55.6	58.0	44.8	59.9
Secondary School — Complete	65.7	65.1	58.3	63.4
Vocational	62.7	48.5	70.0	48.6
University/Other	58.6	40.0	53.1	54.2
Quintile				
Poorest	55.4	57.8	46.6	49.0
2	53.1	52.5	46.7	51.1
3	55.6	53.1	45.5	53.3
4	57.9	52.5	50.6	55.2
Richest	59.2	57.2	56.0	56.0
All	56.2	54.5	49.1	52.8

Note: For definition of categories and Heterogeneity Index, see text.

Table A3: Meeting Attendance in Local Associations, by Region and Household Characteristics and by Type of Association

	Government/ National Groups	Religious Groups	Production Groups	Social Groups
Province				
Jambi	1.1	18.6	5.8	1.9
Jawa Tengah	3.3	15.8	5.3	6.6
NTT	3.4	10.9	3.0	5.3
Head of Household				
Male	2.7	14.7	4.9	3.9
Female	2.6	11.5	4.8	7.7
Religion				
Muslim	2.3	17.1	5.5	3.2
Catholic	3.6	8.1	2.8	5.9
Protestant	3.1	14.3	3.9	4.6
Education				
None	2.6	12.8	4.5	3.9
Primary School — Incomplete	2.7	14.2	4.7	3.9
Primary School — Complete	2.9	15.2	5.1	4.8
Secondary School — Incomplete	2.5	18.0	4.0	2.9
Secondary School — Complete	2.6	10.0	4.5	2.5
Vocational	2.2	12.7	8.9	8.5
University/Other	1.4	10.9	1.5	4.4
Quintile				
Poorest	3.4	14.1	3.8	4.1
2	2.6	16.4	5.1	5.7
3	2.7	14.2	4.7	4.9
4	2.4	14.0	5.7	3.1
Richest	2.5	13.4	5.0	2.8
All	2.7	14.5	4.9	4.2

Note: Figures are average number of meeting attendances in 3-month period. For definition of categories, see text.

Table A4: Index of Active Participation in Decision Making in Local Associations, by Region and Household Characteristics and by Type of Association

	Government/ National Groups	Religious Groups	Production Groups	Social Groups
Province				
Jambi	59.3	66.4	69.9	66.6
Jawa Tengah	55.7	56.6	58.9	70.8
NTT	64.9	74.8	83.0	80.8
Head of Household				
Male	60.3	68.3	68.5	74.4
Female	58.7	63.6	58.6	67.9
Religion				
Muslim	57.1	62.8	63.7	68.2
Catholic	65.6	72.5	81.1	77.1
Protestant	63.9	76.8	83.3	86.1
Education				
None	49.6	62.8	54.8	75.6
Primary School — Incomplete	55.3	65.9	64.1	72.2
Primary School — Complete	62.2	68.0	70.5	71.8
Secondary School — Incomplete	69.4	65.5	71.6	77.1
Secondary School — Complete	68.8	81.5	77.4	78.6
Vocational	78.2	95.6	90.0	88.9
University/Other	61.5	80.0	100.0	83.3
Quintile				
Poorest	49.9	61.9	59.6	73.8
2	60.1	66.5	69.4	71.2
3	61.5	71.6	64.9	74.0
4	64.3	67.7	74.1	71.9
Richest	66.5	73.5	70.1	78.4
All	60.2	68.0	67.7	73.8

Note: For definition of index and categories, see text.

Table A5: Cash Contribution Score, by Region and Household Characteristics and by Type of Association

	Government/ National Groups	Religious Groups	Production Groups	Social Groups
Province				
Jambi	0.14	0.64	1.04	0.61
Jawa Tengah	0.37	0.12	1.56	0.24
NTT	0.24	0.80	1.57	0.36
Head of Household				
Male	0.27	0.61	1.48	0.33
Female	0.26	0.51	0.55	1.78
Religion				
Muslim	0.31	0.45	1.40	0.55
Catholic	0.34	1.09	1.81	0.56
Protestant	0.07	0.49	0.04	0.02
Education				
None	0.24	0.33	0.69	0.39
Primary School — Incomplete	0.26	0.45	1.01	0.33
Primary School — Complete	0.29	0.61	1.51	0.35
Secondary School — Incomplete	0.18	1.41	1.43	1.24
Secondary School — Complete	0.27	0.92	4.49	1.19
Vocational	0.37	0.23	1.83	0.31
University/Other	0.07	1.58	1.83	0.00
Quintile				
Poorest	0.21	0.18	1.00	0.77
2	0.19	0.91	1.14	0.51
3	0.32	0.79	1.73	0.18
4	0.23	0.36	1.02	0.24
Richest	0.38	0.79	2.03	0.65
All	0.27	0.60	1.40	0.46

Note: For definition of score and categories, see text.

Table A6: Work Contribution Score, by Region and Household Characteristics and by Type of Association

	Government/ National Groups	Religious Groups	Production Groups	Social Groups
Province				
Jambi	0.06	0.16	0.17	0.10
Jawa Tengah	1.72	0.39	1.39	2.43
NTT	5.21	9.52	5.98	5.60
Head of Household				
Male	2.80	4.34	2.03	2.88
Female	2.17	2.82	2.17	3.49
Religion				
Muslim	1.11	0.25	0.90	0.49
Catholic	5.30	7.65	5.98	6.90
Protestant	5.19	11.42	6.02	3.52
Education				
None	2.57	4.61	0.41	1.86
Primary School — Incomplete	1.71	3.56	1.55	2.11
Primary School — Complete	3.29	4.47	2.13	3.56
Secondary School — Incomplete	3.74	5.40	3.19	4.14
Secondary School — Complete	3.91	4.56	7.33	1.79
Vocational	0.61	2.33	1.24	4.09
University/Other	4.23	2.98	1.90	5.15
Quintile				
Poorest	3.07	7.25	2.87	4.77
2	2.46	3.86	2.48	3.96
3	3.06	4.00	1.84	2.93
4	2.13	3.31	1.36	1.51
Richest	3.07	2.39	1.70	1.18
All	2.76	4.21	2.04	2.93

Note: For definition of score and categories, see text.

Table A7: Community Orientation, by Region and Household Characteristics and by Type of Association

	Government/ National Groups	Religious Groups	Production Groups	Social Groups
Province				
Jambi	2.3	99.6	92.6	100.0
Jawa Tengah	1.6	99.9	94.6	96.0
NTT	6.4	100.0	86.6	99.6
Head of Household				
Male	3.6	99.8	92.0	99.2
Female	3.4	100.0	93.2	100.0
Religion				
Muslim	2.0	99.7	94.0	98.9
Catholic	5.8	100.0	89.1	99.3
Protestant	7.2	100.0	74.7	100.0
Education				
None	4.1	100.0	98.3	100.0
Primary School — Incomplete	3.1	100.0	91.6	98.7
Primary School — Complete	3.8	99.9	94.1	99.0
Secondary School — Incomplete	4.7	98.5	91.5	100.0
Secondary School — Complete	2.2	100.0	79.3	100.0
Vocational	2.2	100.0	80.4	100.0
University/Other	7.0	100.0	62.5	100.0
Quintile				
Poorest	4.3	100.0	95.8	100.0
2	3.9	99.9	92.8	99.2
3	4.3	100.0	93.0	99.1
4	2.8	99.4	89.3	98.1
Richest	2.7	100.0	89.8	100.0
All	3.6	99.9	92.1	99.2

Note: Figures are percentage of memberships in associations which are initiated by the community. For definition of categories, see text.

Table A8: Composition of Households' Three Most Important Groups, by Region and Household Characteristics

	Government/ National Groups	Religious Groups	Production Groups	Social Groups
Province				
Jambi	0.7	0.9	0.5	0.5
Jawa Tengah	1.3	0.4	0.7	0.1
NTT	1.3	0.8	0.3	0.5
Head of Household				
Male	1.1	0.7	0.5	0.3
Female	0.8	0.7	0.5	0.4
Religion				
Muslim	1.0	0.6	0.6	0.3
Catholic	1.1	0.8	0.4	0.6
Protestant	1.5	0.8	0.1	0.3
Education				
None	1.0	0.6	0.4	0.3
Primary School — Incomplete	1.0	0.7	0.5	0.3
Primary School — Complete	1.2	0.7	0.5	0.4
Secondary School — Incomplete	1.4	0.6	0.3	0.3
Secondary School — Complete	1.3	0.7	0.4	0.3
Vocational	1.3	0.6	0.4	0.3
University/Other	1.3	0.5	0.6	0.3
Quintile				
Poorest	1.1	0.7	0.4	0.3
2	1.1	0.8	0.5	0.3
3	1.1	0.6	0.5	0.4
4	1.1	0.7	0.5	0.3
Richest	1.1	0.6	0.5	0.3
All	1.1	0.7	0.5	0.3

Note: Entries are average number of times each category was listed among the 3 most important groups. "All" line does not add to 3 because some households reported fewer than 3 most important groups.

Table A9 : Means and Standard Deviations of Regression Variables

Variable List	Indonesia		Jambi		Jawa Tengah		Nusa Tenggara Timur	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Dependent Variables								
Ln(Household Expenditure Per Capita)	13.0100	0.632	13.1277	0.528	13.1209	0.619	12.7956	0.673
Fraction of Households below Poverty Line	0.1970	0.398	0.0888	0.285	0.1578	0.365	0.3316	0.471
Durable Goods Score (principal component weights)	0.5600	0.569	0.7983	0.668	0.6645	0.515	0.2454	0.341
Fraction of Households Who Increased Savings	0.1653	0.372	0.0516	0.221	0.3130	0.464	0.1190	0.324
Fraction of Households Who Obtained Credit	0.6121	0.487	0.6075	0.489	0.7735	0.419	0.4557	0.499
Ln(Amount of Credit Received +1)	7.0281	5.789	7.0457	5.854	8.8251	5.117	5.2245	5.816
Number of Times of Participation in Collective Action	25.0704	29.825	13.5931	20.995	30.8728	31.598	29.4380	31.824
Social Capital Variables								
Aggregate Social Capital Index	17.2271	16.975	7.9560	7.731	17.7074	16.125	24.9407	19.578
Number of Active Memberships	5.4617	3.263	3.6476	2.260	6.0025	2.988	6.5266	3.600
Heterogeneity Index	53.2725	19.897	38.8849	15.302	57.6389	18.083	61.6403	18.350
Number of Meeting Attendance Per Membership	5.9501	6.515	6.7899	8.895	5.9729	5.490	5.1855	4.615
Index of Participation in Decision Making	63.4931	31.734	63.4909	28.126	55.5768	31.149	71.3713	33.389
Cash Contribution Score	0.6199	1.844	0.6428	1.425	0.65020	1.664	0.5694	2.293
Work Contribution Score	2.8473	5.877	0.12261	0.864	1.4660	5.571	6.6290	6.724
% of Membership in Community-Initiated Associations	52.8911	25.329	62.2211	28.654	48.0128	25.774	49.5014	18.743
Control Variables								
Household Size	5.0035	2.192	4.7278	1.940	4.3562	1.680	5.8911	2.540
Years of Education Per Adult Household Member	4.8460	2.442	4.8295	2.557	4.6753	2.549	5.0304	2.211
Female Head of Household	0.0800	0.271	0.0860	0.281	0.0712	0.258	0.0835	0.277
Age of Head of Household	44.7845	13.659	41.4871	14.428	48.3003	13.084	44.2000	12.705
Age of Head of Household Squared	2192.05	1319.75	1928.74	1357.89	2503.67	1315.35	2114.66	1227.87
Farmer Household	0.7696	0.422	0.7106	0.454	0.6743	0.469	0.9165	0.277
Land Ownership (Hectares)	1.8549	9.821	2.8979	16.990	0.7266	1.651	2.0561	4.259
Number of Large Animals Owned	3.8593	7.032	1.3266	2.856	2.3079	3.002	7.6405	10.198
Number of Farming Equipment Owned	0.6517	0.552	0.9656	0.225	0.0738	0.271	0.9494	0.501
Jambi	0.3069	0.461	1.0000	0	0	0	0	0
Jawa Tengah	0.3456	0.476	0	0	1.0000	0	0	0
Nusa Tenggara Timur	0.3474	0.476	0	0	0	0	1.0000	0

References

Besley, T. and S. Coate. 1995. "Group Lending, Repayment Incentives and Social Collateral." *Journal of Development Economics* 46(1), pp. 1-18.

Buchinsky, M. 1998. "Recent Advances in Quantile Regression Models." *Journal of Human Resources* 33(1), pp. 88-126.

Coleman, J. 1988. "Social Capital in the Creation of Human Capital." *American Journal of Sociology* 94 (Supplement) S95-S120.

Coleman, J. 1990. *Foundations of Social Theory*. Cambridge, Mass.: Harvard University Press.

Collier, P. 1998a. "The Political Economy of Ethnicity" paper presented at Annual Bank Conference on Development Economics, April 2-21, 1998. Washington, DC: World Bank.

Collier, P. 1998b. "Social Capital and Poverty." Social Capital Initiative Working Paper No. 4, Social Development Department. Washington, DC: World Bank.

Dasgupta, P. 1988. "Trust as a Commodity." In Gambetta, ed., *Trust: Making and Breaking Cooperative Relations*. Oxford: Blackwell.

Davidson, R. and J. Mackinnon. 1993. *Estimation and Inference in Econometrics*. New York: Oxford University Press.

Devereux, J. and R. Fishe. 1993. "Economic Analysis of Group Lending Programs in Developing Countries." *Developing Economies* 31, pp. 102-121.

Easterly, W. and R. Levine. 1995. "Africa's Growth Tragedy: A Retrospective 1960-89", Policy Research Working Paper No. 1503. Washington, DC: World Bank.

Evers, P. 1998. "Village Government—Does the Current System Enhance Good Government?" Mimeo, Social Development Department. Washington, DC: World Bank.

Filmer, D. and L. Pritchett. 1998. "Estimating Wealth Effects Without Expenditure Data—Or Tears," Policy Research Working Paper No. 1994, Washington, DC: World Bank.

Fukuyama, F. 1995. *Trust: The Social Values and the Creation of Prosperity.* New York: Free Press.

Grootaert, C. 1997. "Social Capital: The Missing Link?" Chapter 6 in *Expanding the Measure of Wealth—Indicators of Environmentally Sustainable Development*, Washington, DC: World Bank.

Grootaert, C. 1999. "Local Institutions and Service Delivery in Indonesia," mimeo, Social Development Department. Washington, DC: World Bank.

Grootaert, C. and D. Narayan. 1999. "Local Institutions, Poverty and Household Welfare in Bolivia." Mimeo, Social Development Department. Washington, DC: World Bank.

Grootaert, C., G.-T. Oh, and A. Swamy. 1999. "Social Capital and Outcomes in Burkina Faso." Mimeo, Social Development Department. Washington, DC: World Bank.

Isham, J. 1998. "The Effect of Social Capital on Technology Adoption: Evidence from Rural Tanzania." Mimeo. Department of Economics, University of Maryland, College Park.

Isham, J., Kaufmann, D. and L. Pritchett. 1995. "Governance and the Returns to Investment: An Empirical Investigation," Policy Research Working Paper No. 1550. Washington, DC: World Bank.

Isham, J., Narayan, D. and L. Pritchett. 1995. "Does Participation Improve Performance? Establishing Causality with Subjective data." *World Bank Economic Review* 9(2), 175-200.

Kähkönen, S. 1999. "Does Social Capital Matter in Water and Sanitation Delivery? A Review of the Literature." Social Capital Initiative Working Paper, Social Development Department. Washington, DC: World Bank.

Knack, S. 1999. "Social Capital, Growth and Poverty: A Survey and Extensions". Social Capital Initiative Working Paper, Social Development Department. Washington, DC: World Bank.

Krishna, A., N. Uphoff, and M. Esman (eds.). 1997. *Reasons for Hope—Instructive Experiences in Rural Development*. West Hartford, Conn.: Kumarian Press.

Narayan, D. 1995. "Designing Community-Based Development," Environment Department Paper No. 7. Washington, DC: World Bank.

Narayan, D. and L. Pritchett. 1997. "Cents and Sociability—Household Income and Social Capital in Rural Tanzania." Policy Research Working Paper No. 1796. Washington, DC: World Bank.

Narayan, D. and M. Woolcock. 1999. "Social Capital: Implications for Development Theory, Research and Policy." *World Bank Research Observer*, forthcoming.

Ostrom, E. 1995. "Incentives, Rules of the Game, and Development." In M. Bruno and B. Pleskovic, eds., *Annual Bank Conference on Development Economics 1995*. Washington, DC: World Bank.

Portes, A. 1998. "Social Capital: Its Origins and Applications in Modern Sociology." *Annual Review of Sociology* (24), pp. 1-24.

Putnam, R. with R. Leonardi and R. Nanetti. 1993. *Making Democracy Work: Civic Tradition in Modern Italy*. Princeton: Princeton University Press.

Putnam, R. 1995. "Bowling Alone: America's Declining Social Capital." *Journal of Democracy* 6(1), pp. 65-78.

Rogers, E. M. 1995. *Diffusion of Innovations*. New York: The Free Press.

Rose, R. 1995. "Russia as an Hour Glass society: A Constitution without Citizens." *East European Constitutional Review* 4(3): 34-42.

Serageldin, I. 1996. "Sustainability as Opportunity and the Problem of Social Capital." *Brown Journal of World Affairs* 3(2): 187-203.

Sharma, M. and M. Zeller. 1997. "Repayment Performance in Group-based Credit Programs in Bangladesh: An Empirical Analysis. *World Development* 25(10), pp. 1731-1742.

Stiglitz, J. 1990. "Peer Monitoring and Credit Markets." *World Bank Economic Review* 4(3), pp. 351-366.

Thorbecke, E. 1991. "Adjustment, Growth and Income Distribution in Indonesia." *World Development* 19(11): 1595-1614.

Thorbecke, W. 1998. "The Indonesian Economic Crisis: Social Costs and Policy Implications." Mimeo, Department of Economics, George Mason University, Fairfax, Virginia.

Tjiptoherijanto, P. 1996. "Poverty and Inequality in Indonesia at the end of the 20th Century." *Indonesian Quarterly* 25(3): 251-75.

Uphoff, N. 1992. *Learning from Gal Oya—Possibilities for Participatory Development and Post-Newtonian Social Science*. Ithaca: Cornell University Press.

Uphoff, N. 1993. "Grassroots Organizations and NGOs in Rural Development: Opportunities with Diminishing States and Expanding Market." *World Development* 21(4): 607-22.

Uphoff, N., M. Esman and A. Krishna. 1998. *Reasons for Success—Learning from Instructive Experiences in Rural Development*. West Hartford, Conn.: Kumarian Press.

Werner, S. 1997. "Public Development Services—Experiences from Jambi, Sumatra." Mimeo, Social Development Department. Washington, DC: World Bank.

Werner, S. 1998. "Local Level Institutions and Collective Action." Mimeo, Social Development Department. Washington, DC: World Bank.

Woolcock, M. 1998. "Social Capital and Economic Development: Toward a Theoretical Synthesis and Policy Framework." *Theory and Society* 27(2), 151-208.

World Bank. 1996. "Indonesia—Dimensions of Growth." Country Department III, East Asia and Pacific Region, Report No. 15383-IND, Washington, DC.

World Bank. 1998. "The Local Level Institutions Study: Program Description and Prototype Questionnaires." Local Level Institutions Working Paper No. 2, Social Development Department. Washington, DC: World Bank.

Yunus, M. 1997. "The Grameen Bank Story: Rural Credit in Bangladesh." Chapter 1 in Krishna, Uphoff and Esman (eds.) *Reasons for Hope—Instructive Experiences in Rural Development*, West Hartford, Conn.: Kumarian Press.

Zeller, M. 1998. "Determinants of Repayment Performance in Credit Groups: The Role of Program Design, Intragroup Risk Policy and Social Cohesion." *Economic Development and Cultural Change* 46(3), pp. 599-620.

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