Social capital and poverty in Uganda

Rashid Hassan & Patrick Birungi[1]

This paper investigates the links between social capital and household poverty in Uganda. We assume a two-way causal relationship between poverty and access to social capital. This suggests an endogeneity problem, so the paper uses econometric techniques that control for endogeneity. Using two nationally representative data sets, our analyses revealed that access to social capital defined in terms of membership of social organisations positively affects household income and reduces poverty. Education was the key determinant of income and increases the probability of joining social networks. Our results further show that household income and welfare are positively associated with access to social capital or group participation. This suggests that government strategies to increase household income that take into consideration existing social institutions will go a long way to encourage associational growth and performance and consequently reduce poverty.

Keywords: poverty; social capital; rural; Uganda; Africa

1. Introduction

As in most sub-Saharan African countries, poverty in Uganda is pervasive. The incomes of 39% of the country's population fall below the poverty line (Appleton & Sewanyana, 2003). Poverty is particularly rampant in the rural areas, where 41% of rural residents live below the poverty line, as opposed to 12% of town dwellers. The poorest households are those headed by crop farmers. Households whose heads work in non-crop agricultural sectors, rearing livestock or fishing, do better (Appleton, 1999).

Given the large rural-urban gap in poverty levels in Uganda and the importance of agriculture to the national economy and to rural livelihoods – the sector employs more than 80% of the population and generates 85% of export earnings and 40% of national income (GoU, 2000) – a good understanding of the factors that influence poverty and income inequality in rural communities is crucial for development policy making.

Recent analyses have demonstrated that ownership of social capital by households has strong links to poverty through a positive and significant effect on household per capita expenditure and incomes (Narayan & Pritchett, 1999; Grootaert, 1999; Whiteley, 2000; Maluccio et al., 2000; Tiepoh & Reimer, 2004). In many cases, the social capital impact was found to be as strong as and sometimes stronger than the human capital impact. Earlier studies in Uganda attempted to explain poverty by emphasising the differences in financial, physical and human

[1] Respectively, Professor of Agricultural and Resource Economics and Director of the Centre for Environmental Economics and Policy in Africa (CEEPA), Faculty of Natural and Agricultural Sciences, University of Pretoria; and Senior National Economist, UNDP (United Nations Development Program, Uganda Country Office), Kampala. Corresponding author: rashid.hassan@up.ac.za

capital endowments and paying less attention to the role of social capital (Appleton, 1999; Okwi, 2000). However, since Putnam's seminal paper (1993) on the role of social capital in explaining why the level of income in the north of Italy was higher than in the south, there has been growing interest in understanding the role of social capital in economic development and its effect on household welfare.

Following Collier (2002), the mechanisms through which social capital embedded in social networks, trust and norms is said to reduce poverty can be summarised as: i) facilitating the transmission of knowledge about technology and markets, ii) reducing market failures in information and thereby reducing transactions costs (the costs of obtaining information about technology, the market, the creditworthiness of contract parties, among others), iii) reducing problems of free-riding and thereby facilitating cooperative action, iv) coordinating and monitoring effective public services delivery, and v) ameliorating other conventional resource constraints such as market access or credit limitations and thereby reducing the vulnerability of households to poverty.

A diverse set of local formal and informal social institutions operates in Uganda: community based organisations (CBOs), local village associations, elders' associations, mutual self-help groups, churches, NGOs, government structures such as local councils, cooperatives. Their short- and long-term objectives are also diverse: monitoring and providing public services, establishing income earning activities, and offering mutual assistance and social support. Such institutions may have a significant impact on the poverty status of different population groups. Objectives and structures differ across institutions and different regions of the country, because of the ethnic and religious diversity of the population.

Verifying empirically the impact of social capital on household poverty is a much more difficult task than it may appear at first sight. The reason is that there is a causality problem, with some literature suggesting that the causality actually runs from household poverty to social capital. For instance, when joining associations involves actual cash contributions, poor households will choose those associations that are highly beneficial to them and those that do not require any contributions. On the other hand, if social association is purely for pursuance of leisure activities which are considered luxury, demand for leisure is expected to increase with income. This leads to a reverse causation from welfare to social capital and hence requires use of the right methodology to analyse this two-way causality linkage.

In the literature, the impacts of social capital on measures of well-being are well established. On the other hand, economics literature on social capital formation is limited. Alesina and La Ferrara (2000) in the US, Christoforou (2004) in Europe, and Haddad and Maluccio (2003) in South Africa show that group participation as a measure of social capital is determined by a host of factors such as education, homogeneity of communities, trust and other household characteristics. Studies of this nature are important for generating policies in support of social institutional building and thus poverty reduction. Research towards a causal understanding of the processes through which social capital is formed would therefore make a great contribution to policy making in Uganda.

However, the two areas of the empirical literature – on determinants of social capital and on the impact of social capital on economic outcomes – are not properly linked. Using a purposefully collected data set from rural Uganda, this study intends to contribute to an understanding of the causal relationship between social capital as measured by group participation and household level poverty. Specifically, we examine the importance of social

capital in explaining the level of household poverty in Uganda and the importance of poverty and other determinants in the decision to participate in agrarian groups.

The next section presents a conceptual framework linking poverty and social capital. Section 3 discusses the paper's analytical framework and Section 4 the empirical model used to estimate the determinants of poverty and social capital formation (group participation). Data sets and variables used in the analysis are presented and discussed in Section 5. Section 6 discusses the econometric results and Section 7 concludes.

2. Conceptualising the link between social capital and poverty

The proper conceptualisation of social capital remains elusive without a generally acceptable definition of the term. Dasgupta (1997) argues that social capital means interpersonal networks and nothing more. In fact, all definitions tend to suggest that individual social interactions are at the core of social capital. Also clear from these definitions is that social capital generates externalities and that the mechanism that drives social capital has to do with transmitting information, establishing trust and developing norms of collaboration.

To understand the channels through which social capital operates, we follow a framework suggested by Collier (2002). Collier classifies social capital on the basis of economically beneficial results from three types of externalities it generates. First, social capital facilitates the transmission of knowledge about the behaviour of others, reducing the problem of opportunism through repeat transactions that establish trustworthiness and reputations. Secondly, it facilitates the transmission of knowledge about technology and markets, reducing market failures in information. Lastly, by relying on norms and rules, social capital reduces the problem of free-riding, thereby facilitating cooperative action. We therefore expound on these channels in our discussion, taking into consideration the literature on the subject.

First, and most important for this study, we place major emphasis on the transfer of knowledge about technology and markets. Social capital may reduce levels of poverty through positive externalities of knowledge transfer about adoption of agricultural technologies leading to increased agricultural productivity, and therefore increased household incomes. Diffusion of innovations is facilitated by links between individuals (Narayan & Pritchett, 1999; Isham, 2000; Reid & Salmen, 2000; Birungi & Hassan, 2007; Katungi, 2007). These studies show that social participation in group activities and being connected with the social systems are positively associated with early adoption of technologies.

As Collier (2002) argues, the transmission of knowledge can occur through pooling, in the case of networks and clubs, or through copying, which requires one-way interactions. He argues further that copying tends to be progressive in distribution, except where barriers of social segmentation are high. Such segmentation may include gender, income or ethnic divide, among others. Research on the adoption of innovations suggests that village level spillover effects play a role in individual adoption decisions, raising agricultural productivity and hence household incomes (Foster & Rosenzweig, 1995).

Social capital may reduce market failures in information, which lowers transactions costs and provides a great range of market transactions in output, labour, credit and land, leading to higher household incomes. This can be information about prices, products and behaviour of

other members, among other things. For example, considering the credit market, there are two ways that social capital can reduce transactions costs: it can improve the flow of information between creditors and borrowers and hence reduce adverse selection and moral hazard problems in the credit markets; and it can expand the range of enforcement mechanisms for default on obligations in an environment where recourse to legal systems is costly or impossible (Heikkila et al., 2009).

In his thesis, Collier (2002) also argues that the poor have a lower opportunity cost of time and a lower stock of financial and physical capital than the rich. Since social interaction is time intensive and social capital can often substitute for private capital, the poor may choose to rely more on social capital than the better off. Collier's argument suggests that social capital may ameliorate other resource constraints such as farm equipment, credit and other inputs important in the production process that would have otherwise been obtained in the market, thus reducing the vulnerability of the masses to poverty. As Putnam (1993) puts it, 'in rural agrarian households, social capital allows each farmer to get his work done with less physical capital in the form of tools and equipment because of the borrowing and lending of these tools in the communities'.

Social capital may also facilitate greater cooperation in the direct provision of services that benefit all members of the community and hence improve household well-being. Work by Ostrom (1990) suggests that the ability of local groups to cooperate plays a significant role in preventing the negative consequences of the excessive exploitation of assets that would result from purely individualistic behaviour in open access situations. For instance, Ahuja (1998) shows that in Côte d'Ivoire the degree of land degradation was worse in the more ethnically heterogeneous villages. This result suggests that it is the difference in social factors that may influence the effectiveness of community controls because heterogeneous communities tend to have less cohesion and therefore less trust.

Lastly, Alesina and La Ferrara (2000) argue that social capital measured as participation in associations is highly correlated with political participation and this has critical implications for policy choices. Social groups bring out the voices of the poor against marginalisation by the wealthy and educated elites. Putnam's work in Italy also concludes that the regions of Italy where the populations had a greater degree of horizontal connection had more efficient governments. The mechanism through which these horizontal connections may work is efficient monitoring of government provision of services and hence better household welfare.

On the other hand the literature on determinants of group participation is not well developed. Alesina and La Ferrara (2000) develop a model that links group participation with income inequality, cluster variations in economic activity, race and ethnic origin. The results show that lower trust reduces participation in open groups. Other important factors determining group participation that are mentioned in the literature are education, age, marital status and gender (Alesina & La Ferrara, 2000; Christoforou, 2004; Dasgupta, 2005; Mosley & Verschoor, 2005; Muriisa & Ishtiaq, 2007).

3. Analytical framework

Our premise of analysis is that social capital (S) defined as membership in agrarian associations or groups increases household incomes and therefore reduces poverty. This

suggests that poverty measured as household per capita expenditure (Y) is a function (f) of social capital such that:

$$Y = f(S, Z) \quad (1)$$

where Z is the vector of other independent variables such as education, gender, age, family size, farm size, asset ownership, access to markets, credit and extension services. This formulation is based on the assumption that poor access to (or weaker) social association causes poverty, which is in line with the approaches of earlier studies, Grootaert (1999) in Indonesia, Grootaert & Narayan, (2004) in Bolivia and Narayan & Pritchett (1999) in Tanzania.

Some, on the other hand, argue for a reversed causal relationship between poverty and social capital, such that income levels can influence or determine many indicators of social capital. For instance, if membership in an association requires membership fees or monthly or annual subscriptions, this would suggest that the higher the income the greater the ability to join it. Also, social capital can be considered as an input into the household production function and can therefore be modelled similarly to human capital and other household asset endowments (Grootaert, 1999; Grootaert & Narayan, 2004). In some instances membership in social groups is mainly for pursuing leisure activities. Since leisure is a luxury good, demand for leisure is expected to increase with income. This leads to a reverse causation from welfare level to social capital and suggests that:

$$S = \mathrm{g}(Y, X) \quad (2)$$

where X is a vector of other independent variables, g a functional operator, and all other variables remain as defined above. This formulation is also in line with earlier studies such as Alesina & La Ferrara (2000) in the US, Christoforou (2004) in European countries and Haddad & Maluccio (2003) in South Africa that examined determinants of group memberships using income as one of the determinants.

These formulations suggest a two-way causal link between income and social capital, which indicates a need for an empirical model that takes into account the possible endogeneity and simultaneity problem between social capital and household income. The next section attempts to develop such a model to test hypotheses about the multi-directional links between poverty and social capital empirically.

4. Empirical model and data to analyse the links between poverty and participation in social groups

4.1 Specification of the empirical model

The presence of possible endogenous regressors would require specifying a system of simultaneous equations (Green, 2000). The method of least squares is not appropriate because the endogenous variables are correlated with the disturbance terms. Applying OLS (ordinary least squares) models without correcting for endogeneity therefore leads to biased and inconsistent estimators and hence incorrect inferences. Furthermore, our social capital variable is a discrete choice variable, defining membership of agrarian associations

(member = 1, non-member = 0), suggesting the use of a two-stage estimation involving discrete and continuous dependent variables.

Following Alvarez and Glasgow (1999), the non-recursive two-stage choice model of this nature may be specified as follows:

$$S^* = \gamma_1 Y + \beta_i X_i + \varepsilon_1 \quad (3)$$

$$Y = \gamma_2 S^* + \alpha i Z i + \varepsilon_2 \quad (4)$$

where Y is the continuous per capita household expenditure variable, S* is the binary choice social capital variable, X and Z are vectors of independent variables, ε_1 and ε_2 are the error terms for equations (3) and (4) respectively and $\gamma_1, \gamma_2\ \alpha_i, \beta_i$ are the parameters to be estimated. However, we do not directly observe the latent variable S*; instead we observe the choice made by an individual who takes value 1 if member of a group and 0 if non-member, such that:

$$S = \begin{cases} 1 & if \quad S^* > 0 \\ 0 & if \quad S^* \leq 0 \end{cases} \quad \ldots\ldots\ldots\ldots\ldots 5$$

The reduced form equations would thus be written as:

$$S = \pi_i X_i + \pi_i Z_i + v_1 \quad \ldots\ldots\ldots\ldots\ldots 6$$

$$Y = \lambda_i X_i + \lambda_i Z_i + v_2 \quad \ldots\ldots\ldots\ldots\ldots 7$$

To avoid biased coefficients and inference problems associated with endogeneity, and given the nature of one of the dependent variables used in this model, two estimation procedures are suggested in the literature. The first is the two-stage probit least squares (2SPLS) approach (Amemiya, 1978; Alvarez & Glasgow, 1999). To implement the 2SPLS approach, the reduced form equation for the continuous variable (equation 7) is estimated using OLS, while the reduced form of the binary choice variable (equation 6) is estimated using a probit model. The parameters from the reduced form equations are then used to generate a predicted value for each endogenous variable and these predicted values are then substituted for each endogenous variable as it appears on the right-hand side of the respective equations (3 and 4). Then the equations are re-estimated using the predicted values from the reduced form equations serving as instruments on the right-hand side of the original model equations.

The advantage of using the 2SPLS approach is that it can be applied to either a binary dependent variable with a continuous endogenous regressor on the right-hand side or a continuous dependent variable with a binary endogenous regressor on the right-hand side. However, according to Green (2000) and Alvarez and Glasgow (1999), the major drawback of 2SPLS is that the standard errors produced are biased and their correction is difficult. This implies that statistical inference would not be legitimate. One solution is to use the consistent 2SPLS parameter estimates along with bootstrapped standard errors.

Bootstrapping is a statistical technique where the sampling distributions for the parameter estimates of interest are simulated through an iterative process (Mooney & Duval, 1993; Mooney, 1996). The advantage of bootstrapping is that it allows for the creation of

confidence intervals for statistics where sampling distributions are unknown or, in the case of the 2SPLS, are difficult to estimate.

The second estimation procedure is one developed by Rivers and Vuong (1988), which they termed the 'two-stage conditional maximum likelihood (2SCML)' approach. It is used to obtain consistent and asymptotically efficient estimates for the probit equation. It therefore mitigates the problems of incorrect standard errors directly and there is no need for bootstrapping in this case. The limitation of this approach, however, is that, unlike the 2SPLS, which allows the dependent variable to be either binary or continuous, the 2SCML approach assumes interest in only the structural parameters of the probit equations. To estimate the probit coefficients and their variances following the 2SCML method requires that we estimate the reduced form of the continuous variable equation, obtain the residuals from the reduced form regressions, and add these residuals to the probit equation for the binary choice variable as an additional variable with a corresponding parameter to be estimated.

To identify the determinants of poverty, this study used both the 2SPLS and the 2SCML approach. First the 2SPLS with boot strapped standard errors was applied. Then, in order to identify the determinants of group participation, the results from the 2SPLS approach and those generated by 2SCML approaches were compared.

Before model implementation, the independent variables were first scrutinised for possible correlations, since multicollinearity is a common problem with such data sets. A number of variables that were believed to be strongly correlated with others were dropped. The Huber-White sandwich estimator was also used to correct for possible heteroscedasticity of unknown form (Hausman, 1976; White, 1980). The next section explains the sources of data used in this study and discusses the measurement of the variables used in the analysis.

4.2 Data and the study area

This study used a data set collected through two surveys carried by out the International Policy Research Institute (IFPRI) and the World Bank in corporation with the Uganda Bureau of Statistics (Birungi, 2008). The survey covered eight districts of the country chosen to represent a wide range of social, economic, environmental and institutional circumstances. The survey collected key information on plot and household characteristics as well as the associational life of these households. However, the IFPRI data did not cover key variables such as education and gender of household members and household expenditure (Nkonya et al., 2005). This information was obtained from the national household survey data (GoU, 2002) since the two data sets had common identifiers.

A stratified two-stage sampling was used to draw a sample from the Uganda National Household survey (UNHS). The UNHS covered nearly all the districts with the exception of Pader and parts of Kitgum and Kasese districts because of insecurity in those districts at the time, and these also do not form part of the sample for this study. A total of 972 enumeration areas (565 rural and 407 urban) were randomly selected in the first stage of sampling, from which a total of 9711 households were randomly selected in the second stage. Sampling was proportional to the population density of each district. The IFPRI data used in this study was derived from a subsample of 123 enumeration areas. The IFPRI survey focused on rural enumeration areas as the sampling frame since the main objective of the survey was to collect in-depth natural resource management data (Nkonya et al., 2005). A total of 851 households were selected in the IFPRI survey.

The IFPRI survey administered three questionnaires at household, plot and community levels. This study, however, used only the household and plot level data. The data covered household composition, human and social capital, livestock assets, land use, tenure and market. A number of questionnaires were left out of the analysis because they were considered incomplete or unreliable.

4.3 Variables included in the analysis

- *Controlling for the effect of poverty*

Per capita household expenditure is used to represent poverty. The major assumption is that consumption expenditures are negatively related to poverty. Thus factors that increase consumption expenditure would reduce poverty. This is one of the most widely used approaches (Mukherjee & Benson, 2003).

To compute the per capita household expenditure, data from the UNHS (GoU, 2002) are used. Our household expenditure variable is made up of four components: food, durable non-food, non-durable non-food, and taxes. The welfare indicator is expressed in real terms, normalised using 1989 as the base year. Using per capita expenditure in this case assumes that (i) everyone in the household receives an equal allocation of items consumed, irrespective of age and gender, (ii) everyone has the same needs, irrespective of age and gender, and (iii) the cost of two or three or more people living together is the same as if they lived separately (Mukherjee & Benson, 2003).

- *Controlling for social capital effect*

Our hypothesis to be tested in this case is that social capital increases household incomes and therefore reduces poverty. Because definitions of social capital differ, one major criticism of the notion is that it is very difficult to measure, hence difficult to use in empirical analysis. Various proxies or indices have been used to measure social capital in the literature, some of the most important being membership in local associations and networks (Narayan & Pritchett, 1999; Grootaert, 1999; Alesina & La Ferrara, 2000), indicators of trust and social norms (Haddad & Maluccio, 2003) and indicators of collective action. This survey did not collect information on trust and social norms, but on the associational life of households and communities in the study areas that can be used to assess the impact of social capital on poverty.

In this study, one critical component of social capital, namely participation in associational activities such as religious, youth, women's, savings and burial groups, is used as proxy for access to social capital. Use of participation in group activities is motivated by Putnam et al. (1993), who argue that such participation may lead to transmission of knowledge and may increase aggregate human capital and develop trust, which in turn improves the functioning of markets. Group participation also creates strong internal solidarity and trust, commonly referred to as 'bonding' in the social capital literature.

- *Other explanatory variables*

In selecting our potential regressors, we were guided by the results of the poverty profile of the UNHS (GoU, 2002), results of the Uganda poverty participatory assessment project and the literature on determinants of poverty. The set of regressors we have chosen as possible

Table 1: Definition of variables used in the analysis

Name	Definition	Unit of measure	Model 1	Model 2
Notes: Model 1: Determinants of poverty; Model 2: Determinants of group participation.				
Non-farm inc	Non-farm income	Uganda shillings	+	+/-
Livestock	Livestock in Tropical Livestock Units (TLUs)	Av. TLU for common livestock in Uganda: cow = 0.9, ox = 1.5, calf = 0.25, sheep or goat = 0.2	+	-
Agro-ecology	Defined by productivity potential	Dummy (highland = 1 and others = 0)	+	+
Dist s. road	Distance from plot to seasonal road	Kilometres	-	+
Extension	Availability of agricultural extension	Dummy (yes = 1 and no = 0)	+	-/ +
Education	Education for household head	Number of years	+	+
HH-age	Age of household head	Number of years	+	+
Sex	Sex of household head	1 = male, 0 = female	+	+
HH-size	Size of household	Number of household members	-	—
Time in org	Time spent in organisation activities	Hours	+/-	—
Origin of ins	Whether institution one is member of is local or foreign initiated	1 if local and 0 if foreign	+	—
Ethnic dom	Proportion of dominant ethnic group in the village	Proportion of dominant ethnic group in the village	+/-	+/-
Farm size	Size of a farm a household owns	Acres	+	—
Marital status	Whether married or not	Dummy (married = 1, not married = 0)	—	+

determinants of poverty, their definition and their expected signs of influence are given in Table 1.

5. Associational life and dimensions of social capital in Uganda

5.1 Social capital and associational life in the study area

The analysis of survey data shows that social networks are strong at the inter-household level and in horizontally structured organisations. A few structures associated with local leadership were, however, found to be hierarchical in nature. For example, the government management system was found to have a reporting structure from local council one (LC1) at village level to local council five (LC5) at the district level.

Twenty-two social groups in total were identified and reclassified into three major categories, depending on the services they offer and for ease of analysis: production and financial services, supra-community organisations, and social service groups. The supra-community includes institutions whose services, objectives and membership normally cut across communities or go beyond the borders of particular communities. The description and brief summary of the diverse services they offer are given in Table 2 and discussed thereafter in subsequent subsections.

It is important to note that the services provided by these groups may not be exclusive to members of that particular group or limited to one service type (i.e. not specialised). For example, to a small extent, some burial societies may also organise themselves to offer savings and credit services and other community mobilisation activities. Also, a member is not restricted to one type of group or association but can be a member of more than one type, for example social groups and production groups. All these groups and associations may have a positive impact on farm and non-farm production and therefore on household poverty. They normally facilitate cooperation in the direct provision of services and sharing of information, encourage participation in decision making, provide labour, enhance trust building, ameliorate resource constraints, and so on.

The data show that overall membership in associations tends to be skewed towards locally initiated institutions, which account for more than 81.4% of the total membership. This finding is associated with trust in local organisations built around strong kinship ties among members. All the groups are ethnically homogeneous: more than 93% of them are composed of members from the same ethnic group. The advantage of homogeneous groups is that they tend to be associated with greater trust among members because of stronger kinship ties. The disadvantage, however, is that such associations tend to be conservative and enjoy limited success in acquiring and generating the new skills and knowledge essential for improving both household and community welfare.

5.2 Social capital dimensions by district and income quintiles

Only 67.6% of the bottom 20% of the sample (first quintile) were members of some groups, compared to close to 80% membership of all other groups (i.e. upper quintiles from second to fifth). One possible explanation is that these are poor landless labourers, unable to afford basic subscription requirements, so they end up excluded from all decision-making processes. The poor may have low participation in terms of percentage of members but spend much

Table 2: Associations and groups, and services provided

Groups/classification	Examples	Services provided
Production and financial services	Savings and credit associations	Provision of savings and credit facilities
	Rotating credit schemes	Exchange of labour, provision of livestock and crop, agro-forestry extension services, environmental management activities
	Farmers' groups	
	Women's groups	
Supra-community organisations	Government programmes and structures	Community mobilisation for public good provision
	NGOs	Education, training and sensitisation on various needs
	Political party structures	
	Education and health groups	
Social service groups	Burial societies	Mutual support activities, e.g. provision of household amenities, hospitality, comforting the bereaved, assisting the disadvantaged, meeting funeral expenses and caring for the sick
	Religious groups	
	Drama/choir groups	
	Youth sports clubs	

Table 3: Social capital dimensions by income quintiles and districts

	Membership in orgs (%)	Membership in production and fin. services (%)	Membership in supra-community orgs (%)	Membership in social service orgs (%)	Time in orgs (hours)
Income quintiles					
Bottom	67.62	32.1	12.4	55.6	136.91
2nd	80.56	42.0	7.2	50.8	85.82
3rd	78.99	36.6	7.1	56.3	87.39
4th	79.30	46.9	3.9	49.3	69.90
Top	85.31	44.3	13.7	42.1	77.05
All	78.13	40.3	7.9	51.7	91.18
Districts					
Masaka	59.33	35.2	21.4	43.4	59.19
Iganga	58.80	53.2	10.7	36.1	64.39
Kapchorwa	84.28	89.1	6.5	4.4	53.55
Soroti	60.00	14.3	0.0	85.7	91.80
Arua	65.89	49.7	16.5	33.8	96.40
Lira	65.52	94.7	0.0	5.3	56.41
Kabale	93.98	24.6	1.3	74.1	130.56
Mbarara	95.53	36.3	3.9	59.8	71.86
All	78.13	40.3	7.9	51.7	91.18

more time in associational activities than the rich do. For instance the lowest 20% spend an average of 136.9 hours per year in group activities compared to about 70 hours of participation in the fourth quintile. One possible explanation for this outcome could be the low opportunity cost of time for the rural poor. Secondly, the groups the poor and the rich belong to are different, and so the activities they participate in are different. Poor people tend to belong to social groups, while the rich tend to be more involved in the production related associations (Table 3).

The poor spend more time in social service activities such as burial, choirs, games and sports than in production related activities such as investment in land management activities. Moreover, the poor sometimes make in-kind contributions by offering their labour time as a way of contributing to associational activities, while the rich may pay cash. These findings suggest the importance the poor attach to associational activities. The rich may have limited need to join social associations for mutual support in social ceremonies because they can afford to hire some of these services from commercial providers. Membership of social institutions decreases with an increase in income, while membership of production institutions increases.

Also as expected, districts with strong horizontal networks are more likely to adopt soil conservation and nutrient enhancing practices and thus reduce poverty in these districts. For instance, in Kapchorwa and Lira Districts the most common associations are those classified as production and financial services, while in many other districts households tend to join the social service associations. Production and financial services groups are expected to be directly related to production and investment in land management activities. This could partly explain the greater use of soil nutrient and conservation practices and thus low poverty levels in Kapchorwa District. Surprisingly, this is not the case for Lira District, perhaps because of the insecurity in Lira, which has disrupted people's livelihoods and may make it difficult for the social institutions to function properly.

Membership of at least one local association is highest in the districts of Kapchorwa, Kabale, and Mbarara. However, what is important to note is that in districts such as Kabale and Soroti under 25% belong to production related institutions, with the rest belonging to social or supra-community institutions. Conversely, in Kapchorwa District, where welfare levels are higher, over 89% are in production related institutions, perhaps owing to the strong presence of the Kapchorwa Commercial Farmers Association, which organises maize and barley farmers in the district.

6. Econometric results

6.1 Determinants of poverty

This section presents results of analyses of the determinants of poverty as measured in terms of household expenditure. The estimates of the second stage equation for poverty with bootstrapped standard errors are presented in Table 4. Our discussions focus on these estimates, as they present more legitimate standard errors. The Wald test suggests that the null hypothesis that social capital is exogenous is rejected at a 5% level of significance, which justifies the use of the 2SPLS.

Table 4: Second-stage results of determinants of poverty

Variable	2SPLS with bootstrapped errors	
	Coeff.	***p* level**
*, **, and *** represent the level of significance at 10%, 5% and 1%, respectively.		
Social capital	0.2325***	0.0000
Education	0.2255***	0.0000
HH-size	-0.3776***	0.0000
HH-age	0.3342***	0.0000
Dist s. road	-0.0297**	0.0350
Non-farm inc	0.0182	0.1770
Livestock	0.0357***	0.0000
Sex	0.0330	0.4040
Agro-ecology	0.1981***	0.0000
Extension	0.0807**	0.0140
Farm size	0.0217***	0.0070
Origin of ins	-0.1432***	0.0000
Constant	8.6526***	0.0000
Number of obs	1695	
R^2	0.1613	
Prob > F/Prob > chi^2	0.0000	
Wald test of exogeneity		
Chi^2 (1)	*8.64*	
Prob > chi^2	*0.0028*	
Replications	100	

*, **, and *** represent the level of significance at 10%, 5% and 1%, respectively.

Most variables have the expected signs and are consistent with expectations, except for a few cases discussed below[2]. Better access to social capital significantly increases the level of household expenditure. In fact the impact of social capital on poverty is about equal in magnitude to that of education. These findings are consistent with results of earlier studies (Narayan & Pritchett, 1999; Grootaert, 1999; Tiepoh & Reimer, 2004; Grootaert & Narayan, 2004) that found social capital to be positively linked to household income and welfare.

These findings suggest that poverty analysis in Uganda, which focuses on other forms of capital and ignores social structures through which poverty reduction policies and programmes operate, could be missing a large part of the puzzle. The pathways that create this link, as earlier highlighted, could be sharing of information among members, the reduction of opportunistic behaviour as a result of social pressure, and facilitation of collective decision making (Grootaert, 1999; Collier, 2002). Each of these pathways could easily translate into improved household income and welfare.

Being a member of a local community oriented organisation, however, reduces household expenditure and therefore increases poverty. (Remember that we use expenditure as a proxy measure of income, so low expenditure implies low income and hence what reduces expenditure means reduced income and hence high poverty.) This is contrary to the findings of other authors who suggest that organisations with roots in the communities tend to be more effective in achieving associational objectives than externally imposed organisations. One possible explanation for this is that local associations tend to be homogeneous (i.e. their members share characteristics such as level of education, ethnic group, levels of income and general exposure to the outside world). Such associations tend to reinforce conservatism and are likely to have little success in helping their members acquire and generate new skills and knowledge. Access to heterogeneous ties is more effective in this regard, and therefore critical for innovation. Grootaert (1999) finds that the pool of knowledge to be shared among rural farmers in Indonesia is richer among heterogeneous associations.

The education variable is found to be positively and significantly related to household expenditure and therefore reduces poverty. There are two explanations for this. First, the higher the level of education attained the greater the opportunities for gainful employment and therefore better household welfare and, second, the better-educated households have better access to new information (extension, credit facilities, family planning, hygiene, markets, and so on) and better ability to process it and derive benefit.

Ownership of physical assets, captured in this study by farm size and the household's total livestock, was found to improve household welfare. In rural Uganda, which is the focus of this study, higher earnings depend on asset ownership, particularly land, because land is a fundamental productive asset, a means of generating wealth, and acts as a cushion against shocks and reduces vulnerability to poverty. Deininger and Okidi (2001) show that land in Uganda constitutes 50% to 60% of total asset endowments for the poorest households. On the other hand, livestock assets are a source of cash for investment in other forms of capital and an insurance against contingencies, hence the positive relationship with household expenditure.

Household size was found to have an inverse relationship with household expenditure and, by implication, a positive relationship with poverty. This is a common finding in the literature

[2] Regressor 'Time in org' is dropped from the estimating equations because of the high correlation with he variable 'membership in organisation' (see Table 3) which is also a regressor in this model.

(Lanjouw & Ravallion, 1995; Grootaert, 1999; Datt & Jolliffe, 1999). It suggests that larger households are likely to be poorer than small households, other factors being constant. This result simply means more dependants and hence lower per capita expenditure. Children's contribution to productive labour is low and therefore the labour supply effect would be negligible. This is especially so in Uganda, where the introduction of free universal primary education has reduced child labour supply for basic home chores and farm management.

The results also suggest that households headed by older people and males tend to be better off than those headed by their younger and female counterparts (this is positively related to expenditure, i.e. males and especially those of older age own and accumulate more productive assets). This is expected since older and male household heads in the studied communities typically have better access to productive assets and accumulate more of them, such as land, than females and the younger generation do.

As expected, we find a negative relationship between distance to seasonal road and household expenditure. This finding suggests that the further a household is from a seasonal road the poorer it becomes. Access to road infrastructure improves access to input and output markets, non-farm opportunities and services such as education and health facilities and hence reduces household poverty. The results also show that access to extension services has a positive and significant impact on household expenditure. Provision of extension services to the poor therefore would improve poor farmers' productivity and their household welfare.

An agro-ecological zone variable was introduced to control for agro-climatic effects on household welfare. As noted above, Uganda's agro-ecology is broadly categorised into two major classes: uni-modal and bi-modal rainfall zones. Our results show that households in the bi-modal zones are generally better off than those in the uni-modal ones, which suggests that the favourable climatic conditions in the bi-modal zones, such as long growing periods with adequate rainfall, tend to improve farm productivity and incomes and thus reduce poverty.

This section has shown that, among other factors, access to social capital is very important for poverty reduction. It is therefore important to gain good understanding of the factors that influence participation in social groups and networks.

6.2 Determinants of group participation

As highlighted earlier, group participation is our measure of access to social capital. The 2SPLS and 2SCML results are presented together in Table 5.The results from the 2SCML approach are very close to those calculated under the assumption of normality of the estimators. This section focuses on the results of the 2SCML approach because, as discussed in Section 4 above, they present more legitimate standard errors. The Wald test rejects the null hypothesis that household expenditure is exogenous at a 5% level of statistical significance, which justifies the use of both approaches.

The results show that household expenditure is positively and significantly associated with participation in social institutions and networks, suggesting that individuals with higher incomes are more likely to join social associations than their poor counterparts who may not be able to afford membership fees.

The study also shows a positive relationship between non-farm income and the probability of joining social institutions. This could be capturing the impact of associations for owners of non-farm enterprises, who tend to join associations to acquire information about credit,

Table 5: Estimate of the second-stage equation of determinants of group participation

Variable	2SPLS		2SCML	
	Coeff.	***p* level**	**Coeff.**	***p* level**
*, **, and *** represent the level of significance at 10%, 5% and 1%, respectively.				
HH-expenditure	0.6798***	0.0000	0.6882***	0.0000
Education	0.0898	0.2730	0.0853	0.2990
HH-age	0.2953**	0.0240	0.2956**	0.0240
Non-farm inc	0.0439*	0.0550	0.0438*	0.0560
Livestock	0.0302	0.1950	0.0310	0.1850
Sex	0.3246***	0.0080	0.3200***	0.0090
Extension	0.0132	0.8690	0.0118	0.8830
Ethnic dom	-0.4625	0.1580	-0.4615	0.1600
Dist s. road	0.1807***	0.0000	0.1802***	0.0000
Marital status	0.1411***	0.0060	0.1345***	0.0090
Constant	-7.2337***	0.0000	-7.2913***	0.0000
Regression diagnostics				
Number of obs	1695	1695		
Log likelihood	-805.6497	-805.0183		
LR chi^2 (10)	117.81	119.07		
Prob > chi^2	0.0000	0.0000		
Wald test of exogeneity				
Chi^2 (1)		10.21		
Prob > chi^2		0.0014		

*, **, and *** represent the level of significance at 10%, 5% and 1%, respectively.

technology, markets and inputs in their production process. This finding is in line with Fafchamps and Minten's results (1999), which confirm the importance of business networks in conveying information about employment and market opportunities.

The results show a positive impact of education on participation or access to social capital. The significance of education for enhancing individual incentives to join groups has been confirmed by a number of studies (Alesina & La Ferrara, 2000; Gleaser et al., 2002; Christoforou, 2004; Godquin & Quisumbing, 2005). Better-educated households may have a higher demand for group membership because they can more easily benefit from the positive externalities. Education is also viewed as a way to create opportunities for collective action, either by offering access to social networks and personal acquaintances, or by cultivating values and morals leading to a sense of citizenship and solidarity (Alesina & La Ferrara, 2000; Christoforou, 2004). Another factor in the literature that explains the positive social capital-education relationship is the idea that social skills are learned from schools.

The gender variable suggests that being male increases the probability of joining a social group. This is perhaps partly because women carry the biggest burden of family and domestic chores such as cooking, child rearing, and so on. Being married also significantly increases the probability of group membership, suggesting that unmarried people have fewer incentives to join groups. A positive relationship was found between age of household head and participation in associational activities. Alesina and La Ferrara (2000) justify a similar finding that younger households are particularly busy because of marriage, having children and setting up new households. Older people may participate more, since they have more time than their younger counterparts. Dominance of one ethnic group in the village is negatively associated with the probability of joining social groups. This could be because such ethnic homogeneity reduces the need for forming social associations, as all their functions are automatically assumed by some alternative internal kinship forms of social support.

Poor road access, measured in this study as the distance to the nearest seasonal road, increases the probability of participating in group activities. This could be seen as a survival strategy, to reduce the transactions costs of acquiring and sharing information, and solving their social needs, to mitigate public sector failures in the matter of road provision.

7. Conclusions and policy implications

Using two nationally representative data sets, the study this paper is based on investigated how social capital affects household poverty, in particular the impact that participating in an agrarian association has on household level poverty. Our basic premise was that social capital increases household incomes and therefore reduces poverty. However, we observed that the level of household expenditure might determine certain components of social capital, thus suggesting a two-way causality, which implies an endogeneity problem. The presence of endogenous regressors therefore led us to use the econometric techniques 2SPLS and 2SCML that control for endogeneity. Our main conclusions were as follows.

Social capital, defined in terms of membership of local and other organisations, has a positive impact on household income and therefore reduces poverty. Households that invest in social capital tend to be much better off than their non-participating counterparts. The impact of social capital on household welfare compares well with that of other forms of capital such as human capital (e.g. education). This finding suggests that government poverty reduction programmes and strategies need to take into consideration existing social

structures. To have an efficient public intervention process, and given the different impacts of different policy variables on the incomes or poverty levels of different groups, government needs to try the following.

First, understand the nature and objectives of the existing social institutions through which poverty reduction programmes may be channelled. This may help identify different intervention programmes for different social groups. For instance, the fact that returns to investment in social capital are higher for households belonging to production related associations than for those belonging to social institutions suggests the need for an intervention strategy that would enable the existing social institutions to offer services similar to those provided by the production related associations. This would enhance the performance of the social institutions.

Second, work with existing social institutions to design and deliver projects. For instance, government extension and micro-finance services could exploit existing social institutions. This would encourage interaction between policy makers and social institutions and thus improve beneficiary targeting, reduce project costs, enhance sustainability and strengthen social organisations.

And third, invest in social capital, and create an enabling environment to foster and strengthen the social capital in the country. This could be done through direct investments, for example by providing financial support, supplying equipment (e.g. tractors) and developing infrastructure (e.g. silos). It could also be done either directly by providing training and capacity building for local organisations or indirectly by providing an enabling environment for their performance (in the form of a legal framework).

Homogeneous associations, measured by membership of a local community oriented organisation, tend to be welfare decreasing. The cause of this may be the inbreeding and conservatism associated with and common in these groups. This implies a need to develop a policy that will provide a bridge between these groups and other local and national associations and NGOs. Valuable here would be capacity building programmes on production technologies, and market information access using the local institutions' mobilisation infrastructure. This can be achieved through the government extension infrastructure or the relevant NGOs, to break down the information barriers.

Education is a crucial factor that determines household incomes but it also has a strong positive influence on the probability of joining social groups. Public intervention in the provision of good quality education for rural households would therefore be crucial in the fight against poverty. Continued government support for free primary education, adult literacy programmes and other productivity enhancing training opportunities could be of paramount importance in enhancing social participation and reducing poverty.

The strong association between access to assets, particularly land, and better incomes, and the way this helps reduce poverty, has important policy implications. Interventions to modify the rules that determine access to land and the way land is distributed among members of a community, for example, may be critical for more efficient use of land, a lower incidence of poverty and a decrease in inequality. This can be achieved through land laws that would encourage equitable land distribution.

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