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Cents and Sociability: Household Income and Social Capital in Rural Tanzania*

Deepa Narayan and Lant Pritchett *World Bank*

I. Introduction

Beyond what is apparently now old-fashioned "physical" capital, human capital, natural capital, institutional capital, and social capital all clamor for attention. With capitalism all the rage, perhaps the proliferating rechristening as "capital" otherwise perfectly serviceable concepts is understandable. But fashion aside, the popularity of "capital"-isms is due in part to the robust usefulness of the underlying metaphor: stuff that augments incomes but is not totally consumed in use. The attraction of investigating the incomes of households by examining their ownership of the various "capitals" is obvious. However, while obvious, an exclusive focus on households is seriously incomplete. Factors both at the national level of policies and institutions and at the community level affect the fortunes of households and are potentially as important as the household's own capitals.¹

In this article we show that associational relationships and social norms of villages in rural Tanzania are both capital and social. After outlining the various concepts of social capital we tell how and why we created data on social capital using a large-scale household survey in rural Tanzania that was designed to query households about their social connections and attitudes. By using the Social Capital and Poverty Survey (SCPS) and data from a different survey, which also had information on incomes, we show that a village's social capital has an effect on the incomes of the households in that village, an effect that is empirically large, definitely social, and plausibly causal. Finally, we use the two data sets to examine a number of proximate channels through which social capital appears to operate.

II. Social Capital: Definitions and Data

Social capital, while not all things to all people, is many things to many people. A dramatic restriction of what one might mean must precede any

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attempt to estimate either social capital or its effect. What do we mean and what do we not mean by social capital and why do we think it might affect incomes?

By social capital we mean the quantity and quality of associational life and the related social norms. The basic survey instrument, the Social Capital and Poverty Survey, asked individuals a variety of questions about three dimensions of social capital. First, individuals were queried about their membership in various voluntary associations or groups in order to investigate the raw magnitude. For each group in which an individual reported membership, questions were asked about that group's characteristics in several dimensions relevant to that group's contribution to social capital. For instance, if the group's membership is "inclusive" we assumed any given individual's membership in that group contributed more to social capital than membership in a group in which membership is "exclusive" to a particular clan or ethnic group. With these data on the frequency of membership and the characteristics of groups, we created an index of village associational life, which, we argue, is a proxy for social capital. In addition to the information on associational life we sought to explore the existence and role of social and civic norms and individual's attitudes toward others, focusing in particular on the degree of trust individuals felt toward social groups, such as family, village, or tribe, and toward government authorities at the local, district, and national level.

While social capital thus defined as the quantity and quality of local associational life is clearly social, it is capital? Does it fit the capital metaphor of something accumulated that contributes to higher income (or, more broadly, better outcomes)? Five mechanisms are proposed to show how local social capital affects outcomes. From an economist's viewpoint, all of these share the characteristic that pure noncooperative action would lead to inferior outcomes and hence that greater social capital potentially leads to better outcomes by facilitating greater cooperation.

First, Robert Putnam's fascinating analysis of the variations in public-sector efficacy of the newly created regional governments in Italy suggests that the regions of Italy in which the population had a greater degree of horizontal connections had more efficacious governments.² He documents a close connection between the numbers of voluntary associations and the efficacy of the regional government. Putnam finds that the more likely a region's citizens are to join football clubs and choral societies the faster the regional government is in reimbursing healthcare claims. One way of understanding this result is that monitoring the performance of the government is facilitated by greater social capital, either directly, because the government agents themselves are more embedded in the social network, or perhaps indirectly, because the monitoring of the public provision of services is a public good (this is true even if the publicly provided service is itself a private good as long as quality cannot be individually differentiated).³

Second, independent of the efficacy of governmental activity, the role of group or community cooperative action in solving problems with local "common property" elements is potentially important. Elinor Ostrom's work suggests that the ability of local groups to cooperate plays a significant role in avoiding the negative consequences of the excessive exploitation or undermaintenance of assets that would result from purely individualistic behavior under open access.⁴ She points out that the infamous "tragedy of the commons," based on purely individualistic behavior, is only one possible outcome and that cooperative action can be a stable outcome. Vinod Ajuha shows that in Côte d'Ivoire the degree of land degradation is worse in more ethnically heterogeneous villages, suggesting that a difference in the effectiveness of community controls and cooperation depends on social factors.⁵ Robert Wade documents wide differences in the extent of cooperation within villages in southern India, which he attributes significantly to differences in the benefits from cooperation because of differences in the physical characteristics of the irrigation network serving the villages.⁶ Social capital may facilitate greater cooperation in the direct provision of services that benefit all members of the community.

Third, diffusion of innovations might be facilitated by greater linkages among individuals. In his review of empirical work on the diffusion of innovations, Everett Rogers reports studies that suggest that "social participation," "interconnectedness with the social system," "exposure to interpersonal communication channels," and "belonging to highly interconnected systems" are each positively associated with the early adoption of innovations.⁷ Recent research on the adoption of Green Revolution innovations suggests that village-level spillovers played a role in individuals' adoption decisions but it does not examine the role that social capital may have played in mediating the village-level effects.⁸

Fourth, greater associational activity may lead to less "imperfect information" and hence lower transaction costs and a greater range of market transactions in outputs, credit, land, and labor, leading to higher incomes. Social links among parties to economic transactions may increase their ability to participate in economic transactions that involve some uncertainty about compliance, such as credit. There are two possible mechanisms at work. Social capital could lead to a better flow of information between creditors and borrowers and hence less adverse selection and moral hazard in the market for credit. Social capital also potentially expands the range of enforcement mechanisms for default on obligations in environments in which recourse to the legal system is costly or impossible.

Fifth, greater sharing of household risk and informal insurance may

allow households to pursue higher returns but more risky activities and production techniques. If this is so, then a social safety net that mitigates the consequences of adverse outcomes would lead farmers to undertake higher-return, but also higher-risk, activities.⁹ Increased social capital could lead to greater risk sharing among villagers and act as an informal safety net.

What do we not mean by social capital? There are many other equally plausible and perhaps empirically important definitions of "social capital" that we do not explore. In order to distinguish our work from the previous literature, it helps to begin with a more general definition. In the abstract, a "society" can be thought of as a series of nodes (e.g., individuals, households) and a set of connections between those nodes. The connections between the nodes can be any kind of relationship, whether a social relationship (e.g., familial, ethnic), shared beliefs (e.g., religious), group identification (e.g., national, local), or a voluntary association, whether economic (e.g., employee, creditor) or noneconomic (e.g., social club). Different notions of social capital can be distinguished by two features. First, whether the focus is on the nodes themselves, and hence on individuals' social ties, or on the connections between the nodes, which are intrinsically social. The second distinguishing feature of the existing empirical studies on social capital is the specification of what "connections" between individuals are counted and how much weight each different type of link should receive.

While we examine social capital by examining the effect of the density of associational life on village outcomes, there is a considerable body of work on social capital that examines individuals' ownership of social capital by examining the worth to each individual of his or her social connection to other nodes. The emphasis in this literature is on the effect on the individual of having social links to valuable nodes, such as having a rich uncle, growing up in a good neighborhood, or being a member of a successful ethnic group.¹⁰

We examine the links that were created between individuals by memberships in voluntary associations and social norms, which potentially excludes other dimensions of social capital. First, we do not examine the effect of any sense of affiliation with a nation or nation-state or any measure of distributional or ethnic conflict within the polity.¹¹ Second, we do not examine as 'capital' the institutional capacity of specific governmental or nongovernmental organizations or, governmental in the broad sense of society, possessing a well-known and legally sanctioned set of 'rules of the game.' Third, we do not analyze any cultural values or attitudes, such as degrees of compassion, altruism, respect, or tolerance.¹² Fourth, we do not examine the issues explored recently by Stephen Knack and Philip Keefer (among others) on the relationship between trust, norms of civic cooperation, associational activity, and aggregate economic growth and investment rates.¹³

III. Data on Social Capital

We cannot examine the effects of what we mean by social capital, only the effects of what we measure. The sections below describe the survey and the procedure we used to construct our measure of social capital. The Social Capital and Poverty Survey was carried out in rural Tanzania in April and May of 1995 as part of a larger participatory poverty assessment.¹⁴ While the households were chosen randomly within clusters, the sampling clusters themselves, which correspond roughly to villages in rural areas, were the same as those randomly selected for use in the 1993 Human Resource Development Survey (HRDS); hence the SCPS and HRDS data can be matched village by village.¹⁵ The total usable SCPS sample is 1,376 households located in 87 clusters.¹⁶

The survey's social-capital component queried one household respondent about three dimensions of social capital: first, their membership in groups; second, the characteristics of those groups in which the households were members; and third, the individual's values and attitudes, particularly their definition and expressed level of trust in various groups and their perception of social cohesion. In this article we describe the groups only briefly. A fuller description of the groups, their activities, and the results of qualitative information from interviews and participatory data collection methods appears in a companion paper.¹⁷

The first set of questions was simply about the number of groups in which an individual was a member. The average number of groups per person was 1.5, and table 1 lists the most prevalent groups by percent and number, individuals' responses as to their "most important" group, and the groups the individuals would join if they could join only one group. Most groups are Christian churches, mosques, the village burial society, women's groups, and the political party. The more purely eco-

	Group as a Percentage of All Membership	Number of Households with Members	"Most important group in your life at present?"	"If you could join only one group, which one would it be?"
Church	21	230	29	24
Political party (CCM)	17	195	10	3
Burial society	15	167	19	14
Women's group	9	104	5	8
Muslim group	9	109	11	8
Farmers' group	8	87	8	16
Other	21	252	N.A.	N.A.

TABLE 1

GROUPS	in Rural	Tanzania,	BY	MEMBERSHIP	AND	CHARACTERISTICS

NOTE.—In this table, "other" includes (with percentage reporting): youth group (7), primary society (4), cooperative (2), rotating credit societies (2), dairy/cattle (1), and other (5). N.A. = not applicable.

nomic associations (cooperatives, rotating-credit groups) are much less important. In the construction of our measure of social capital we deliberately do not differentiate by type of group, as the main purpose is to examine whether groups with noneconomic functions have village-level spillover effects on economic outcomes.¹⁸

In addition to questions about membership, a second set of questions was asked about the characteristics of the each group in which individuals reported membership. These were grouped into five categories: (1) kin heterogeneity of membership, (2) income heterogeneity of membership, (3) group functioning, (4) group decision making, and (5) voluntary membership. The five questions in the three categories listed in detail in table 2 were those that proved useful in defining social capital for the empirical analysis below.¹⁹

To combine these questions into a single numerical index, various strong (and arbitrary) assumptions were necessarily made about the weights and the aggregation. First, since the variables were on different

Question	Responses	Frequency
Number of groups:		
How many [from a prompted enu-	0	32.3
meration of groups in the village]	1	40.4
are you a member of?	2	17.4
2	3 or greater	9.9
Kin heterogeneity:	-	
Are [the group's] members the	Close relatives	1.09
same kin or the same clan?*	Same clan	2.95
	Different tribes	25.7
	Anyone in the village	70.2
Income heterogeneity:		
Are all members from the same eco-	All same livelihood	5.7
nomic group, do they all make a	Most are the same	11.9
living in the same way?*	Mixed	82.3
Do the leaders or group officials	Different livelihood	33.2
earn their living in the same way as other members or in different ways?*	Same livelihood	66.7
Group functioning:		
Overall, how would you rate the	Very poorly	2.1
group functioning?*	Poorly/weakly	8.5
6 1 6	Average	23.7
	Good	47.4
	Excellent	18.3
If there is a fee, what happens if a	Asked to leave the group	30.1
member does not pay the fee?*	Delay in payment accepted	17.4
I S S S S S S S S S S S S S S S S S S S	Nothing happens	52.5

TABLE 2

QUESTIONS FOR SUBCOMPONENTS OF SOCIAL CAPITAL

NOTE.—Based on the nonmissing observations for each category.

* Answers recorded for up to three groups for each individual.

discrete scales, before they could be combined in an index all the variables were rescaled to a common scale of zero to 100.²⁰ Second, we assumed that being a member of each group made a greater contribution to social capital if the group was more heterogeneous across kinship groups, more inclusive and horizontal, and better functioning. Hence the contribution of each group to social capital is an equally weighted subindex of these three characteristics. The village-level social-capital index is the product of the average number of groups with the average characteristics of those groups. Since the absolute scale for this index is arbitrary, we renormalize the index to have a mean of zero and a standard deviation of one.²¹

Before we examine the specific hypotheses about social capital, we set the context by giving an overview of the situation and activities of the people who were surveyed. Rural Tanzania is a clear case of arrested economic development. Tanzanians are very poor, with average per person consumption expenditures reported in the 1993-94 HRDS in rural areas at 50 U.S. cents a day (\$180 per person per year).²² Most of the population is employed in traditional agriculture with a substantial subsistence component, as the imputed value of production for own consumption accounts for half of consumption expenditures. Nearly all agriculture is rain fed and uses almost no modern inputs, is labor intensive depending primarily on household labor, and uses a few rudimentary tools with an almost complete lack of mechanization. The data from the HRDS confirm that the health and nutrition status of the population is very low, with an infant mortality rate of 92 in 1991-92 and 47% of children showing signs of stunting. The government's past emphasis on primary schooling means that although many adults in rural households have primary schooling and the average years of schooling completed for adults is about 4.5, very few rural residents have secondary schooling.

IV. Social Capital and Incomes

We show that associational life is in fact social capital first by showing that it is capital and then by showing that this capital is social. After establishing a strong association between the social capital in a village and incomes of households in that village, we use instrumental variables estimation to argue that this association is leading to higher incomes because of higher social capital, not because higher incomes lead to greater associational life. We then show that the effect of village social capital on household incomes is truly social by showing that there is an independent effect at the village level.

Both the SCPS and HRDS collected data on the economic and demographic characteristics of households. Total consumption expenditures per person in the household were estimated, including imputations for own-produced consumption and for consumer durables (e.g., housing). We use expenditures as a proxy for income (and use the terms interchangeably) for two reasons. First, theoretically, when there is saving and dissaving (and especially with functioning capital markets), current expenditures are a better measure of permanent income than is current income. Second, pragmatically, extensive experience with household surveys has shown that it is extremely difficult (if not impossible) to measure the income of the agrarian self-employed who constitute the bulk of our sample.²³

In order to estimate the effect of social capital on income we first adopt a specification of the determinants of per person household expenditures that includes both household individual (Z_{ij}) and village-level (X_j) variables:²⁴

$$H_{ii} = \beta \cdot Social \ Capital_i + \alpha \cdot Z_{ii} + \gamma \cdot X_i + \epsilon_{ii}. \tag{1}$$

The following household characteristics are included: the average years of schooling of male and female adults (older than 20 years) in the household, a dummy variable if the head of the household was self-employed in agriculture, a dummy variable for female-headed households, and an index of nonland, nonagricultural, physical assets.²⁵

In the base specification there are two village-level variables other than social capital. First, the median distance of dwellings in the cluster to a market for crops is included as a proxy for the market integration of the village.²⁶ Second, a set of dummy variables for six agroclimatic regions of Tanzania is included to control partially for the economic and agroclimatic diversity of the country.

Is "Social Capital" Capital?

Column 1 of table 3 presents the results of an ordinary least squares estimation of the partial correlation between a cluster's average household per person expenditures and social capital, controlling for this set of variables. The coefficient on the social-capital index is empirically large and moderately statistically significant (p = .08). Households in villages with higher levels of social capital have significantly higher expenditures.

However, social capital (associational life) may simply be a normal consumption good so that richer households consume more. That is, perhaps associational life is not "capital" but "consumption" that is greater for households with greater income or leisure.²⁷ If richer individuals live together, then it is more likely that richer villages are associated with higher village social capital. In the United States, for example, higher income in a neighborhood would be associated with higher ownership of luxury cars, but this does not imply that poorer neighborhoods with more Mercedes or other luxury cars would necessarily be richer. We answer this objection about the direction of influence between social capital and income in three ways. In this section we use instrumental variables estimation; in the next section we show that it is the village's

	CLUSTER	AVERAGES	House	еногр
	%STO	IV (a)	IV [‡] (Instrument Set A)	IV (Instrument Set B)
	(1)	(2)	(3)	(4)
Social capital	.119	.496	.559	.345
	1.80	2.75	5.37§	1.29
Household size	011	033	073	075
	.21	.424	8.66	6.21
Average adult schooling†	030	105	.0087	.013
	.789	1.66	.512	.761
Female head of household $(1 = yes)$	439	458	090	070
	.714	.566	.810	.676
Asset ownership (1n)†	.102	038	.176	.207
	1.24	.297	2.78	3.58
Self-employed in agriculture $(1 = yes)$	– .99	975	207	203
	2.76	1.92	2.12	2.32
Distance to nearest market (cluster) [†]	023	015	.0062	.0018
	1.57	.801	.286	.090
Agroclimatic zones§ Regression statistics: Number of observations Adjusted R^2 First stage incremental R^2 Instrument test (<i>p</i> -level)	53 .272 	53 .274	846 .099 .004	846 .345
SOURCE.—Social Capital and Poverty Sun * The <i>t</i> -statistics are Huber-corrected stan † If observations for any of these variable ‡ The instrument sets are: trust in strange § Included in the regressions but not repo	vey. dard errors that are het s for households were rs, tribesman, cell lead rted here are dummy v	teroscedasticity consist missing, a missing du er, village chairman (g variables for each of si	ant and account for stratified rai mmy variable was set equal to o overnment), district officials, ce agroclimatic zones.	ndom sampling. one (not reported). entral government.

HOUSEHOLD EXPENDITURES PER PERSON AND SOCIAL CAPTIAL

TABLE 3

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social capital that matters, not the individual's; and the final section presents evidence on the different causal mechanisms by which social capital increases income.

Instrumental variables (IV) estimation uses the correlation between social capital and another variable—the instrument—that is not determined by and does not directly determine income to estimate the effect of exogenous shifts in social capital on income. This eliminates the difficulty created by the potentially simultaneous determination of income and social capital. The drawback is that one must have valid instruments and, worse, the validity of an instrument depends entirely on theoretical arguments about the structure of the model.

As mentioned above, questions were posed to households about individuals' "trust" in various groups. We posit that certain of the these "trust" variables, particularly an individual's trust in strangers and trust in various government officials, are not affected directly by household income nor do they affect income directly, but that greater levels of trust do lead to higher village social capital.²⁸ Column 2 of table 3 shows the IV estimates of the social-capital effect using cluster-level data based on those assumptions. The estimated effect of social capital is substantially larger than the ordinary least squares estimates and is now strongly statistically significant. This supports a view that social capital is an exogenous determinant of income because if social capital were purely a consumption good and higher incomes led to greater social capital, then the IV estimates of the effect of social capital should have been lower than the ordinary least squares estimates, instead of much higher. The higher point estimate is consistent with a lack of joint determination of the two variables and a large degree of measurement error in our social-capital variable, since measurement error leads to bias toward zero.²⁹

Columns 3 and 4 of table 3 show the same expenditure regressions at the household level. Using the household-level data we get very similar results on social capital, a coefficient of .56 or .34 depending on the instrument set, compared with .49 using the cluster level. It is not surprising that the estimates on the control variables, such as education, are much more reasonable (i.e., not negative) when the household data are used.

The standard test for the exogeneity of the instrument set (which is essentially testing whether trust does not itself cause higher incomes except through its effect on social capital) does not reject the instruments in the cluster data, but the test does reject the instrument set in the household data. The variable "trust in strangers" causes the validity test to reject the instrument-set. This is puzzling because it is the most plausibly exogenous variable, as we thought "trust in strangers" would be the variable least likely to be affected by income or associational activity. An estimation that uses household data without "trust in strangers" as an instrument provides a quantitatively similar (.34) result in which the exogeneity test is not rejected.

Is "Social Capital" Social?

The second question is whether participation in associational life raises incomes only of those who directly participate or whether social capital produces spillovers to other individuals. We can address this question in two ways.

First, column 1 of table 4 shows the result of regressing household incomes on the social capital of the village (calculated net of each household's contribution to village social capital) and on the household's own social capital. The entire effect is due to village-level social capital and none is due to the household's own measured social capital. This finding is made more interesting by the fact that most of the variation in the social-capital index is actually across households within the same village, which should make it easier to estimate the household effect precisely and more difficult to estimate the village effect. However, this attempt to disentangle social from individual effects is not entirely compelling because of the many difficulties with this procedure. Particularly problematic are the arbitrary, but necessary, assumptions that the effects are linear and constant across individuals.

The second way we show that the social-capital effect is a village effect, not only a household effect, is to match the HRDS data on expenditure per household and other household and village characteristics with the SCPS data on social capital at the village level. All of the households that were surveyed in order to estimate expenditures are located in the same villages, but they are not (except for possible coincidental repeats) the same households that we used to measure social capital. Column 2 of table 4 shows the results of regressing household incomes from the HRDS on social capital from the SCPS (and the other household and cluster variables calculated from the HRDS) using instrumental variables estimation. The estimated effect is still large and statistically significant in both the cluster and household-level regressions. That is, the social capital of the households interviewed in the SCPS has an effect on the incomes of other households in their village (surveyed 2 years previously) as well as on their own incomes.³⁰ This is like finding that one household's land or asset ownership is important not only for one's own output but also for one's neighbor's. This effect of one set of individuals on another set of individuals in the same villages is both quite unique, in its ability to create this matching, and important. These results imply that at least some significant fraction of associational life creates capital that is locally social.

Moreover, these results provide a powerful second argument against a causation from income to greater social capital. If individuals with

	Social Capital and Poverty Survey	Human	Resource an ment Survi	d Develop- ey
	Household	Cluster		
	OLS*	IV	IV [∥] (A)	IV (B)
	(1)	(2)	(3)	(4)
Cluster-level social capital	.084	.208	.193	.227
	1.10	2.56	2.31	1.71
Household-level social capital‡	020 .526	· · · ·	· · · ·	· · · ·
Household size	077	.019	080	079
	7.61	1.04	10.5	10.3
Average adult schooling†	.019	057	.021	.021
	1.43	1.42	2.87	2.79
Female head of household				
(1 = yes)	041	.345	009	010
	(.448)	1.19	.150	.173
Asset ownership (1n)†	.253	.245	.143	.143
	4.40	3.88	5.26	5.20
Self-employed in agriculture $(1 = yes)$	193	325	068	069
	2.36	1.19	1.69	1.68
Distance to nearest market (cluster)†	0036	004	0087	0087
	.243	1.05	2.21	2.21
Agroclimatic zone dummies Regression statistics: Number of observations Adjusted R^2 First-stage incremental R^2 Instrument test (n-level)	846 .215	84 .092 618	1505 .116 .783	1505 .061 .786
mountent test (p-level)		.010	.705	.700

HOUSEHOLD EXPENDITURES PER PERSON AND SOCIAL CAPITAL, COMPARING THE VILLAGE AND HOUSEHOLD LEVEL AND USING HUMAN RESOURCE DEVELOPMENT SURVEY DATA FOR INCOME

TABLE 4

* The t-statistics are based on Huber corrected standard errors that are heteroscedasticity consistent and account for stratified sampling.

[†] If any of these variables were missing then a value was imputed for that household and a missing dummy variable is set equal to one.

Cluster-level social-capital index excludes household's own response. \$Included in the regressions but not reported are dummy variables for each of six agroclimatic zones and the three missing-value dummy variables.

Instrument set A includes trust in strangers, tribesman, cell leader, village chairman (government), district officials, central government, while instrument set B excludes strangers.

higher incomes have greater social capital because social capital is a luxury (or even normal) good, then one would expect that the results would appear only when linking a given household's income to that same household's social capital.³¹ But this interpretation of the coefficient as representing only higher demand for associational activity is not supported by the results in table 4, which show strong spillover effects.

Before detailing in the following section the causal mechanisms through which social capital has its effects, we must state that to our surprise the results are an embarrassment of riches. We would not have guessed at effects as large as those estimated, especially given all the obvious empirical difficulties in measurement, index definition, equation specification, and so forth. The instrumental variable estimates from SCPS imply that a one-standard-deviation increase in village social capital increases the income of all households in the village by approximately 50%, and the estimates that use the HRDS show an increase in income of 20% (table 5). In more concrete terms, if half of the inhabitants of the village are members of one additional group (with average characteristics), this village would have a social-capital index that is higher by one standard deviation than a village where group membership was zero.³² While increasing average membership by one-half group per household (or changing group characteristics to a similar degree) is a substantial shift in social behavior, the estimates suggest that this would

			Increase in E Standard	Exenditures f Deviation In	FROM ONE
				Dolla	rs†
Source of Estimates	Point Estimate	Standard Deviation	Percentage*	Household	Per person‡
Social capital:					
SCPS, household	.56	1	56	655	101
SCPS, cluster	.49	1	49	690	106
HRDS, household	.19	1	19	222	34
HRDS, cluster	.21	1	21	245	38
Education:					
SCPS, household	.009	3.21	2.9	34	5.2
HRDS, household	.019	2.70	5.1	60	9.2
Assets:					
SCPS, household	.18	1.24	22	261	40
HRDS, household	.14	1.36	19	222	34

TABLE 5

MAGNITUDE OF THE ESTIMATES OF VARIOUS DETERMINANTS OF INCOME

NOTE.—SCPS = Social Capital and Poverty Survey; HRDS = Human Resources Development Survey.

* Using natural log change as approximation to percentage change.

† Based on the assumption of mean per capita consumption of \$180.

‡ At the household average of 6.5 members per household.

increase expected incomes by 20%-50%, which is an impressively large effect.

These effects on income are very large relative to other well-known determinants of income, such as schooling or physical assets. A one-standard-deviation-increase in education, which is an additional 3 years of schooling per adult, would increase incomes only between 3% and 5%. Similarly, increasing nonfarm physical assets by one standard deviation is associated with only a 19%-22% increase in expenditures.

Fortuitous Association: Is This Really Social Capital?

The possibility remains that the estimated effects of village social capital are merely an artifact and that social capital is proxying for some unobserved characteristic of villages (the omitted variable must be at the village, not the household level in order to explain the HRDS results). It is impossible to reject this possibility econometrically because village-level fixed effects that would eliminate the potential bias would also preclude estimating the most interesting village-level spillover effect of social capital. We can, however, reduce the plausibility of omitted variable bias in two ways.

First we ask how bad it could possibly be. If an omitted variable were biasing the social-capital coefficient upward, the magnitude of the bias would be worse the greater the effect of this omitted cluster-specific variable. The importance of excluded cluster variables can be examined by comparing the R^2 of various regressions explaining household incomes. With only household characteristics, the R^2 is .262 in the HRDS. adding social capital and cluster distance to markets and agroclimatic dummies raises it to .291, and adding the cluster averages of all the individual variables (education, assets, etc.) raises it to .342. A full set of cluster dummy variables in addition to household characteristics raises the R^2 to .462, so there are about 12 points of unexplained cluster variation. This relatively large variation in household incomes, which is both cluster specific and unexplained by the included variables, suggests a potentially large omitted variables bias. However, the correlation of the estimates of the cluster effects across the two data sets is only .07. This low correlation suggests that the unexplained cluster variation is primarily caused by temporary random shocks or measurement error and not by some time-persistent excluded variable correlated with social capital of the type that would significantly bias the results.³³

The alternative tack for addressing omitted variable bias is the usual "kitchen sink" robustness test performed by adding to the regression all the cluster-level variables for which we can create measures. The first row of table 6 shows the "base case" estimate, while the following rows show the estimate of social capital with different sets of cluster-specific

Coefficient (<i>t</i> -statistic) on Social Capital	Variables Included
(0.193 (2.31)	Base set (table 4, col. 1)
.178 (2.61)	Base set plus cluster averages of education, assets, house- hold size, female headship, self-employed in agri- culture
.267 (2.89)	Base set plus land quality variable from Social Capital and Poverty Survey
.273 (2.88)	Base set plus land quality variable from Human Resources Development Survey
.155 (2.01)	Base set plus district population density and financial institutions per person

ROBUSTNESS OF THE ESTIMATE ON SOCIAL CAPITAL TO INCLUSION OF OTHER VARIABLES, USING THE HUMAN RESOURCES DEVELOPMENT SURVEY HOUSEHOLD-LEVEL DATA

TABLE 6

NOTE.—Full regressions are given in the appendix.

variables added. Adding the cluster averages of all of the household-level variables already included in the regression only slightly lowers the estimate (and raises the *t*-statistic).

The most plausible candidate for a variable that could cause both higher income and higher social capital is land quality, but it is excluded from our base-case regression. As argued by Hans P. Binswanger, Shahidur R. Khandker, and Mark Rosenzweig, higher-quality land leads to higher output, greater density of population, and more physical and financial infrastructure.³⁴ These greater levels of economic activity are likely to lead to greater social capital. We address the land-quality question in two ways. In the SCPS, households were asked to subjectively rank the quality of their land in particular and of the land in the village generally. Including the village-level land quality does not alter the strength or significance of social capital (and produces puzzling results).³⁵ The next best strategy is to add explanatory variables that ought to be related to land quality according to this theory, such as population density and banking facilities per person.³⁶ As shown in the last row of table 6, the addition of these variables does not substantially alter the strength of the social-capital effect.

V. How Does Social Capital Work?

Econometric estimates show a large (and arguably causative) effect of a village's level of social capital on the incomes of all households in that village. To understand this result fully it is useful to examine the proxi-

mate mechanisms through which social capital affects income in rural Tanzania. As stated in the introduction, the literature has suggested five plausible channels of influence, which we explore below.³⁷

Social Capital and Effective Public Services

Unfortunately, we do not have the clean natural experiment that Putnam studied in the Italian case with the creation of new regional governments with clearly assigned responsibilities.³⁸ Tanzania, since gaining its independence, has been controlled by the same party that, although the government is organized along provincial and district lines, has exercised centralized control over nearly all government and party activities. Although there has been much emphasis on Tanzania's "cooperatives" and "village"-level organizations, these were in fact not autonomous, locally controlled organizations but a monopoly of the party.³⁹ As a result we cannot match data on social capital to the level of government jurisdiction formally responsible for the provision of public services. Therefore, any effect of social capital on the effectiveness of publicly provided services must work indirectly, possibly through greater cooperation of villagers in monitoring the performance of government, rather than directly through the formal political apparatus.

The HRDS has data on the quality of two government-provided public services: schools and health clinics. While the objective "quality" of a school or clinic is difficult to measure, the HRDS measured the subjectively perceived quality using an innovative two-step procedure. Households were first asked to rank the importance of each of five characteristics of their local school and health clinic by allocating 20 stones across five pictures that represented facility characteristics. Each respondent was then asked to assess the quality of their local facility on those same characteristics on a scale of 1-5. From these sets of questions an index of the subjectively perceived quality of each public facility (school or health clinic) can be constructed.⁴⁰

In addition, the HRDS asked a series of questions about the level of parental and community involvement in the schools, which made it possible for us to construct an index of parental participation.⁴¹ The HRDS also asked individuals about their attendance at "meetings where issues important to the community, such as health and education, could be discussed." Table 7 shows that social capital in the SCPS survey is associated with the higher reported levels of parental participation in schools and attendance at community meetings that are reported in the HRDS data (HRDS surveyed individuals other than those that had been used to measure social capital). Moreover, higher social capital is associated with higher levels of school quality. These findings trace a possible chain of causation from greater social capital to more parental and community involvement in schools to better quality schools. There is, however, no link at all between health-facility quality and social capital. This

		BIVARIATE RA	ANK CORRELATIONS
	SURVEY	Social-Capital Index	Group Functioning Subcomponent
Median parental participation in schools	HRDS	.243 (.025)	.202 (.065)
Attendance at community meetings	HRDS	.296 (.006)	.117 (.291)
School quality	HRDS	.176 (.108)	.238 (.029)
Health-facility quality	HRDS	.132 (.288)	039 (.724)
Participation in joint efforts at road repairs	SCPS	.147 (.182)	.272 (.012)

TABLE 7 Correlation of Social Capital with Indicators of Parental Participation in Schools, School Quality, and Health-Facility Quality

NOTE.—*p*-levels are in parentheses. HRDS = Human Resources Development Survey; SCPS = Social Capital and Poverty Survey.

is perhaps not surprising as the major factors for health-clinic quality were drug availability and qualified doctors (see appendix), factors that are largely beyond village control.⁴²

Social Capital and Village-Level Cooperation

Another possible channel for the effect of social capital is the management of resources that are treated as common property within the village or among several villages, such as improved water supplies, local irrigation capabilities, and local roads. Unfortunately, on this question we have very little data, but SCPS households were asked if they participated in joint activities aimed at building or maintaining roads. Villages with more social capital were more likely to have had community roadbuilding activities (table 7). This does suggest another possible link through village cooperative activity.

Social Capital and Agricultural Practices

Although the discussion illustrates some channels through which social capital affected outcomes, no solid link can be made with higher incomes, which, given the region's economic context, were mainly determined by agricultural incomes. Much more important as a proximate determinant of incomes is the greater likelihood that households located in villages with larger social capital have used fertilizer, agrochemical in-

puts, or improved seeds (table 8). A one-standard-deviation increase in village social capital increases the probability of using agrochemicals by 42% (6.7 percentage points above a mean of 16), of using fertilizer by 38% (5 percentage points), and of using improved seeds by 17% (2 percentage points). We also find that in villages with higher social capital a larger fraction of households reported using credit for agricultural improvements. Since only 9% of households reported using credit use by almost a third (2.7 percentage points). As with the effects on income, these results are quite strong. The positive association of the adoption of improved practices and credit use with social capital holds true whether one controls for the individual's self-reported land quality or for the extent of the individual's contact with an extension agent.

The results on the adoption of improved practices are consistent with at least three stories about the effect of social capital: innovation diffusion, overcoming market failures that were caused by imperfect information, and informal insurance. There are arguments for and against each of these explanations of the differences in agricultural practices.

Innovation Diffusion

The increased use of agricultural inputs is consistent with a story of better diffusion of information, both about the availability and the proper use of seeds, fertilizer, and chemicals. However, given that clearly superior practices are usually adopted very rapidly and that the listed "innovations" have been around for some time, it is doubtful that this channel could explain such large differences.

Imperfect Information

It has long been recognized that economic performance will be enhanced by a social situation in which market transactions are facilitated. This facilitation in turn is enhanced by greater confidence that one's potential partners are likely to be reliable. The reliability of partners is affected by a number of factors, such as the available mechanisms for formal or informal enforcement and expected compliance with social norms. A. Greif argues that personal ties and reputation among traders were an important part of the development of long-distance trade.⁴³ Transaction patterns generated by social ties in an environment of weak formal enforcement of legal contracts are common, especially in business networks among ethnically or culturally similar groups.

Informal Insurance

Among low-income households, risk aversion may inhibit the adoption of high-return innovations if such innovations are associated with higher risk. While each element of this common story is plausible, there is no connection between the degree of inequality among households in the

	Used Agrochemicals	Used Fertilizer	Used Improved Seeds	Used Credit for Agricultural Improvements
Village social capital	.057	.075	.015	.027
Household size	(2.35) .012	(2.45) 006	(.737) .004	(1.66) 0019
Average household adult education	(3.25) .019 	(1.43) .0078	(1.03) .010	(.742) .0044
Female head of household	(5.00) 102	(1.20) 112	(2.30) 114	(1.21) .0035
(1 = yes) Assets	(2.89) .049	(3.46) .110	(3.51).058	(.143) .0069
	(2.45)	(6.28)	(2.63)	(909)
Self-employed in agriculture	.046	035	037	027
	(1.49)	(.958)	(1.06)	(1.03)
Median distance to market	013	.005	005	0052
Observed probability	(217).	(220.)	.169	.093
Predicted probability at means	.155	.129	.125	.078
N	772	734	765	842
Pseudo R^2	.204	.254	.147	.071
NOTE.—The <i>t</i> -statistics reported are the Included in the regression but not reported	he Huber corrected for the were dummy variables f	ne probit regression c or agroclimatic zones	oefficients, not the <i>t</i> -statistic and for missing values of t	ss of the reported marginal is he assets, schooling, and di

TABLE 8

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same village and social capital. In the multivariate specification that is also used for the levels of income, the social-capital index has a zero estimated association with either the standard deviation of log expenditures or the coefficient of variation of expenditures (using data from both surveys). The estimated effect of social capital on median expenditures is quite similar (actually slightly higher) than the effect on mean expenditures, whereas an effect that shifted the dispersion of log-normally distributed incomes would affect these two differently. These findings suggest that social capital appears to shift (natural log) expenditures upward without affecting inequality of distribution. It is possible that informal insurance increased incomes and the variance of incomes. However, the variance increase in incomes is offset just as the variance of expenditures remains unchanged. The lack of association between expenditure inequality, combined with the limitations of our data, which contain no direct evidence on intrahousehold transfers or informal insurance, leaves the question open.

VI. Conclusion

Using a specially designed large-scale survey (SCPS) to measure the degree and characteristics of associational activity as a proxy for social capital and trust among households in rural Tanzania, we find that a onestandard-deviation increase in the village social capital index (as would be caused by half the population of a village joining one additional group with average characteristics) is associated with at least 20% higher expenditures per person in each household in the village. The link between the social-capital index from the SCPS and expenditures measured in an earlier survey of different households in the same villages (HRDS) shows convincingly that this effect is social and operates at the village level. The social capital of a household's village is as important in determining the household's income as are many of the household's own characteristics, such as schooling, assets, distance to markets, or gender of household head. Social capital is an important, and so far largely missing, dimension of income and poverty analysis. Poverty analysis that focuses exclusively on the capital of individuals and ignores the local, community, and social context could be missing a large part of the poverty puzzle.44

Moreover, we identify a number of theoretically plausible proximate mechanisms whereby social capital affects individual income. Members of households in villages with more social capital are more likely to enjoy better public services, use advanced agricultural practices, join in communal activities, and use credit for agricultural improvements. Those mechanisms, together with the econometric robustness of the magnitude of the social-capital effect when the instrumental variable estimation technique is used suggest that social capital is capital and not merely a consumption good.

While these results are very strong, we do not want to overstate the claims that can be supported by them. First, while we do show that the level of social capital affects the level of income, we do not make claims that the level of social capital affects the growth rate of income (in this regard social capital is similar in its effects to physical and human capital). Second, there is clearly scope for institutional substitution in the resolution of various types of market failure in cooperation, and while some of these resolutions may be social-capital intensive, others are likely to involve more formal, bureaucratic, technocratic, and less personal modes. It may well be that the problem in facilitating development of effective modes of cooperation is not so much a matter of not having a deep associational network or not having a well-run bureaucracy with impartial enforcement of rules, but it is particularly acute in societies that lack either one of these. Third, the econometric results presented here do not immediately generalize to all other social and economic contexts.

The results of this article alone are obviously insufficient as a basis for policy but they do raise important considerations and suggest exploration in several areas. First, since social capital is capital, investing in it is potentially beneficial to individuals; but since social capital is social, it is unlikely that the market will produce the right amount of it. But the fact that the market will not produce the right amount creates no presumption that government action will produce the right amount either. Our research has not empirically identified any policy levers available to expand social capital nor estimated the costs of creating social capital.⁴⁵

With the present state of knowledge, "do no harm" is probably the best guide. While seemingly platitudinous, this advice is nontrivial and has serious bite. Many would argue that the previous centralizing, technocratic, and excessively narrow tendencies of some governments, and especially of development assistance, may have depleted rather than created social capital and may, in fact, have done significant harm.⁴⁶

Furthermore, our results are consistent with the increasing emphasis on both broadening and localizing decision-making power. This is a common thread running through a number of recent research and reform initiatives: greater emphasis on beneficiary participation, a greater role in service provision for local and nongovernmental organizations, decentralization (or federalization) and localization of public services, an increased emphasis on community, the (still too infrequent) use of demand-driven procedures in "social funds," and recognition of the role the citizen's voice plays in the efficacy of government projects.⁴⁷ The present results emphasize the role of local conditions but also raise the issue that with more delegation of responsibility or power to grassroots levels, some communities are going to be more effective than others. While this is no argument against such reforms, this differential capacity (perhaps because of differing social capital) will need to be considered, with efforts to expand the capacities of the weak groups.

Appendix

TABLE A1

Characteristic	Mean Weight	Mean Ranking
Schools:		
Well-qualified teachers who teach children well	.252	3.18
Excellent headmaster who manages the school well	.188	3.41
Enough supplies so that each child has a desk and work-		
books	.245	2.46
Clean building with toilets and playground	.163	2.75
Emphasizes academics, requiring no self-reliance work	.149	3.15
Health facility:		
Drugs always available when you visit	.261	2.29
Well-qualified, trustworthy doctors and nurses	.228	3.12
Close to your homes, in the village or ward	.165	2.91
Clean, with toilet, safe water, covered waiting area	.155	2.93
Public services: sanitation, immunization, control of pests	.189	2.98

School and Health Facility Quality Indicators

SOURCE.—Human Resources Development Survey.

Notes

* The Social Capital and Poverty Survey was conducted as part of a Participatory Poverty Assessment led by Deepa Narayan as a joint activity of the government of Tanzania, the University of Dar Es Salaam, and the World Bank, and funded by the British Overseas Development Agency. The Human Resource Development Survey data used in this article come from a nationally representative survey of 5,000 households in Tanzania. This survey was a joint effort undertaken by the Department of Economics of the University of Dar es Salaam, the government of Tanzania, and the World Bank, and was funded by the World Bank, the government of Japan, and the British Overseas Development Agency. We would like to thank Jonathan Isham and Sushenjit Bandopadhyay for collaboration in the early stages of the research; Christiaan Grootaert, Dean Joliffe, Michael Kremer, Peter Lanjouw, Jonathan Morduch, and Emiliana Vegas for useful comments; and Deon Filmer for help and insights on the econometrics. The findings, interpretations, and conclusions expressed in this article are entirely ours. They do not necessarily reflect the views of the World Bank, its executive directors, or the countries they represent.

1. Mancur Olson, "Distinguished Lecture on Economics in Government: Big Bills Left on the Sidewalk: Why Some Nations Are Rich, and Others Poor," *Journal of Economic Perspectives* 10, no. 2 (1996): 1–24; Martin Ravallion and Quentin Woodon, "Poor Areas, or Only Poor People?" Policy Research Working Paper no. 1798 (World Bank, Washington, D.C., July 1997).

2. Robert D. Putnam, Robert Leonardi, and Raffaella Nanetti, Making De-

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mocracy Work: Civic Traditions in Modern Italy (Princeton, N.J.: Princeton University Press, 1993).

3. Alberto Alesina, Reza Baqir, and William Easterly, "Public Goods and Ethnic Divisions," National Bureau of Economic Research Working Paper Series (U.S.), no. 6009 (April 1997), show that greater ethnic fragmentation in U.S. cities leads to lower spending on productive public goods (e.g., education, roads, sewers) and is negatively related to the share of local spending on welfare. Although they are not able to measure efficacy directly, their results also suggest higher public employment with greater fragmentation, possibly the results of higher patronage.

4. Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge and New York: Cambridge University Press, 1990).

5. Vinod Ajuha, "Land Degradation, Agricultural Productivity and Common Property: Evidence from Côte d'Ivoire" (University of Maryland, College Park, 1996, photocopied).

6. Robert Wade, *Village Republics* (Cambridge: Cambridge University Press, 1988).

7. Everett Rogers, Diffusion of Innovations (New York: Free Press, 1983).

8. Timothy Besley and Anne Case, "Diffusion as a Learning Process: Evidence from HYV Cotton," Discussion Paper no. 174 (Princeton University, Woodrow Wilson School of Public and International Affairs Research Program in Development Studies, Princeton, N.J., 1994), pp. 1–19; Andrew Foster and Mark R. Rosenzweig, "Learning by Doing and Learning from Others: Human Capital and Technical Change in Agriculture," *Journal of Political Economy* 103 (1995): 1176–1209.

9. Jonathan Morduch, "Income Smoothing and Consumption Smoothing," *Journal of Economic Perspectives*, vol. 9, no. 3 (1995).

10. Anne Case and Lawrence Katz, "The Company You Keep: The Effects of Family and Neighborhood on Disadvantaged Youths," Working Paper no. 3705 (National Bureau of Economic Research, Cambridge, Mass., May 1991); George J. Borjas, "Ethnicity, Neighborhoods, and Human Capital Externalities," *American Economic Review* 85, no. 3 (1991): 365–90.

11. William Easterly and Ross Levine, "Africa's Growth Tragedy: Policies and Ethnic Divisions," *Quarterly Journal of Economics* 112 (November 1997): 1203–50, have shown that a measure of "ethnic heterogeneity" is empirically associated with the adoption of bad economic policies, which they attribute to the importance of distributional conflict among groups.

12. Explaining economic performance by "cultural" characteristics such as the "Protestant work ethic" or "Confucianism" has a history that is long and checkered, as it easily veers to cultural self-congratulation or condescension. Recent work on the topic includes Lawrence Harrison, *Who Prospers? How Cultural Values Shape Economic and Political Success* (New York: Basic, 1992), on culture, and Francis Fukuyama's examination of the importance of trust, *Trust: The Social Virtues and the Creation of Prosperity* (New York: Free Press, 1996).

13. Stephen Knack and Philip Keefer, "Does Social Capital Have an Economic Payoff? A Cross-Country Investigation," *Quarterly Journal of Economics* 112 (November 1997): 1251–88.

14. Deepa Narayan, Voices of the Poor: Poverty and Social Capital in Tanzania, ESD Monograph Series (Washington, D.C.: World Bank, 1997).

15. Also, rather than carry out new randomization, the households in the sample were the same as those sampled in the 1994–95 Agricultural Survey, with the addition of up to five nonagricultural households randomly selected within the cluster.

16. The survey was implemented in two parts, a social capital module and a household module devoted primarily to measuring household expenditures, but unfortunately, the second part was only administered in every other cluster, so only 53 clusters have SCPS expenditure data.

17. Narayan, Voices of the Poor.

18. Early results suggested that excluding economic groups altogether had very little influence on the findings, as would be expected given their small share.

19. Earlier work on this data set used principal components to create an index, but it was abandoned for three reasons. First, using a multiplicative rather than an additive index to combine membership and characteristics was appropriate. Second, the principal components methodology was not appropriate as the intercorrelations among these dimensions are not particularly high (the first principal component "explained" only 35% of the total variation). Third, the results on the first principal component alone were not robust when extended to other data and variables.

20. The rescaling of the various integer scales was done under the assumption that the observed indicator divided up evenly some underlying uniformly distributed continuous variable ranging from zero to 100 into N categories. The numerical value of being the *k*th of the N_1 categories for the *l*th indicator is:

$$\mathbf{V}_{k,l} = (100/N_l) \cdot k - 100/(N_l \cdot 2).$$
(2)

As long as the value assigned to each category is the mean of the observations in that category, this procedure will not induce inconsistency in the resulting estimates.

21. This is done using the mean and standard deviation for all 87 clusters. Therefore the samples used below may not have exactly a mean of zero and a standard deviation of one.

22. The World Bank's *World Development Report*, *1995* (Oxford University Press, 1995) reports Tanzania as tied with Mozambique for the lowest GNP per capita of US\$90.

23. Angus Deaton, *The Analysis of Household Surveys: Microeconometric Analysis for Development Policy* (Baltimore: Johns Hopkins University Press, 1997).

24. This specification was previously developed and used in an examination of rural poverty in Tanzania in several World Bank reports.

25. The average of both male and female adults is used for simplicity, although it should be noted that when genders are included separately the average education of adult females in the household had a much larger estimated effect on incomes than did male schooling. The index was created by assigning the following weights to ownership of the following assets, assuming that they are in working condition (in the SCPS): sewing machine, bicycle, car, motorcycle, van, or truck = 16; radio = 8; table = 6; clock, watch, or bed = 4; chair = 3; lamps = 2. The HRDS has a less complete list of assets: bicycles = 16; radios or cameras = 8; watches = 4. Originally a weight of 400 was assigned to bicycle, car, motorcycle, van, or truck, but the very few observations with ownership of those assets dominated the variation, so it was (regrettably and arbitrarily) reassigned a weight of 16.

26. In the World Bank study of rural poverty, distance to market was interacted with an index of road quality and produced a strong income effect. In our case we could not replicate the road quality index with our HRDS sample and so used the simpler, but less appealing, measure of distance only. 27. This argument is weakened by the fact that the social capital index is only partly a measure of associational activity, as it reflects more the nature of those groups of which individuals are members, and as such are at least plausibly less related to income, than is the magnitude of activity. To use Robert Putnam's illustration, it may well be that richer individuals bowl more, but it is less clear why they should bowl more in groups when they do bowl. Robert Putnam, "Bowling Alone: America's Declining Social Capital," *Journal of Democracy* 6, no. 1 (1995): 65–78.

28. A recent investigation using cross-national data from the World Values Surveys does find a strong bivariate correlation between expressed degrees of trust and membership in associations. Rafael La Porta, Florencio Lopez-de-Silanes, Andre Shleifer, and Robert Vishny, "Trust in Large Organizations" (Harvard University, Department of Economics, 1997, photocopied).

29. The fact that the IV estimates are higher may reflect measurement error in the village-level social-capital variable. Since we are using only between 15 and 20 households per cluster, the cluster-level average social capital will contain a substantial component of measurement error in measuring the cluster's true social capital. If this were a univariate regression, the ratio of the ordinary least squared to IV estimates is an estimate of the ratio of the true signal to the total variance. The estimates suggest the noise is very large. The correlation in repeated measurements is also a measure of the noise-to-signal ratio. While we do not have repeated measurements in the same villages for social capital, the correlation of the two village-level estimates of expenditures per person is .45; thus if the magnitude of measurement error between the two variables is similar, these estimates are consistent.

30. This similarity is all the more remarkable given the very low correlations of cluster-level averages across the two surveys for most of the variables. The Spearman correlation coefficient is .42 for expenditures per person, .12 for average education, .13 for assets, and .33 for median distance to market.

31. This is true unless all of the income variation across households is because of village effects, while in fact nearly all the observed variation in household incomes is because of non-cluster-related household effects.

32. Since the index is multiplicative between group membership and the characteristics of groups matter, and since the index is normalized twice, it requires some working back to find out that, evaluated at the average group characteristics, increasing group membership by .5 would increase the social-capital index by one standard deviation.

33. The alternative is that the lurking omitted variable is so highly correlated with social capital that its effect, once it is controlled for social capital, is very small. This however, begs the question, as it is extremely unlikely that the omitted variable and social capital are perfectly correlated unless both are in some sense a proxy for the same underlying social reality.

34. Hans P. Binswanger, Shahidur R. Khandker, and Mark Rosenzweig, "How Infrastructure and Financial Institutions Affect Agricultural Output and Investment in India," *Journal of Development Economics* 41 (1993): 337–66.

35. The land-quality variable is consistently negative in the income regression (although not always significantly so), which is likely because of the weakness of subjective ranking. For example, when ranked on a scale of 1-5, a disproportionate number of individual responses were heaped on 3, which gives the data very little variation, a problem compounded by averaging over clusters.

36. Although the story line about bank activity following economic activity is mitigated in the Tanzanian case by the fact that the financial sector was completely dominated by one large government owned commercial bank, famous for its nonprofit maximizing behavior.

37. Economists have tended to neglect the role of social factors in economic outcomes, not out of any well-founded belief that these were unimportant, but rather because they were difficult to model and measure. In particular, there is the danger of confusing statements about what outcomes would be under the assumptions of purely individualistic behavior in which market failures are often discussed with actual positive statements about what would in fact happen. There is a clear role for social capital within any positive economic theory of actual social outcomes, but modeling it convincingly is very difficult.

38. Putnam, Leonardi, and Nanetti (n. 2 above).

39. In particular, during the 1970s the government pursued a policy of forced "villagization" that was neither particularly well received by those affected nor successful.

40. In arithmetic terms, quality index in the *j*th village based on the *i*th household's assessed importance of the characteristic α_c and household's ranking of that characteristic R_c is defined as:

$$QI_{j} = \frac{\sum_{i=1}^{N_{j}} \left(\sum_{c=1}^{5} \alpha_{c}^{i} \cdot R_{c}^{i}\right)}{N_{i}}.$$
(3)

The principal difficulty with this measure at the cluster level is that there is little coherence among households' rankings of the same facility. That is, on each of the five rankings of school quality, within-cluster differences account for more than 85% of the total variation, which raises some questions about the reliability or interpretation of the rankings.

41. The questions asked about the closest government primary school were: "Are parents asked to participate in decisions affecting the school?" "Does the school have an active parent/teacher committee?" "Does the school have open days for parents to visit?" "Does the school report grades?"

42. While we do confirm an association between social capital, community involvement, and better public services, we should point out that strictly speaking this does not go far in "explaining" the income effect of social capital as a proximate determinant, as we have no evidence on the magnitude of the link of better schools to higher incomes and, moreover, in the data above the link with income and the quantity of schooling is quite weak in tables 3 and 4.

43. Avner Greif, "Contract Enforceability and Economic Institutions in Early Trade: The Maghribi Traders' Coalition," *American Economic Review* 83 (1993): 525–48.

44. Narayan, Voices of the Poor (n. 14 above).

45. One of the intriguing things about Robert Putnam (Putnam, Leonardi, and Nanetti) is that he traces the determinants of regional variations in social capital in Italy back hundreds of years to the happenstance of ancient history. Although this is great for solving the research problem of purging the estimates of joint endogeneity, since history is irreversible, it is not much help for policy.

46. Elinor Ostrom, "Incentives, Rules of the Game, and Development," in *Annual Bank Conference on Development Economics* (Washington, D.C.: World Bank, 1995).

47. Among many other recent papers along these lines see Jonathan Isham, Deepa Narayan, and Lant Pritchett, "Does Participation Improve Performance: Establishing Causality with Subjective Data," *World Bank Economic Review* 9, no. 2 (1995): 175–200; Deepa Narayan, "The Contribution of People's Partici-

pation in 121 Rural Water Projects," Environment and Social Department Occasional Paper Series no. 1. (World Bank, Washington, D.C., 1995), and "Designing Community-Based Development," Environment Department Papers, Participation Series no. 7 (World Bank, Washington, D.C., 1995); and Jonathan Isham, Daniel Kaufmann, and Lant Pritchett, "Civil Liberties, Democracy, and the Performance of Government Projects," *World Bank Economic Review* 11, no. 2 (1997): 219–42.

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