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ASC Working Paper 90 / 2010

UKaid from the Department for International Development

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The formation of community based organizations in sub-Saharan Africa: An analysis of a quasi-experiment*

by

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Abstract:

Previous analyses of the formation and composition of community based organizations (CBOs) have used cross section data. So, causal inference has been compromised. We obviate this problem by using data from a quasi-experiment in which villages were formed by government officials selecting and clustering households. Our findings are as follows: CBO co-memberships are more likely between geographically proximate households and less likely between early and late settlers, members of female headed households are *not* excluded, in poorer villages CBO co-membership networks are denser and, while wealthier households may have been instrumental in setting up CBOs, poorer households engage shortly afterwards.

Keywords: Community Based Organizations; quasi-experiment; social networks

JEL: D71; D31; O12

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* We owe a huge debt of thanks to our field researchers in Zimbabwe, especially to Michael Shambare, Charles Shayanewako and Nyaradzo Dzobo without whom the merging and completing of the datasets we use here would have not been possible. We would also like to thank the participants in the development session at the 30th INSNA conference in July 2010 for their insightful comments and encouragement. The support of the Economic and Social Research Council (UK), the Department for International Development and the Netherlands Organisation for Scientific Research (NWO/WOTRO) is gratefully acknowledged. The usual disclaimer applies.

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The formation of Community Based Organizations in sub-Saharan Africa: An analysis of a quasi-experiment

1. Introduction

Recent years have witnessed a renewed policy interest in community-based development. This interest is predicated on the idea that community involvement in intervention planning and execution leads to more effective and equitable development. In practice, community-based interventions are often channelled through Community Based Organizations (CBOs). In one critical respect this practice is well founded: CBOs often emerge in response to and play an important role in providing public goods and resolving collective action problems when formal institutions are deficient (Putnam 2000, Coleman 1988, Ostrom 1990). And for this reason, they are particularly important in poor countries where the government is unable or unwilling to provide much needed social services, especially in rural areas (Edwards and Hulme 1995, Fafchamps 2006).

However, whether effective and equitable development can be achieved through and by assisting CBOs ultimately depends on their composition and on where they do and do not emerge. If they are composed of local elites, interventions channelled through them are likely to reflect the preferences and interests of those elites (Platteau and Gaspart 2003). Similarly, if CBOs form along gender or ethnic lines, their mode of operation is likely to reflect the interests of specific gender or ethnic groups rather than the interests of the community as a whole. And if they tend not to emerge in the poorest communities, then those communities, i.e., the ones in greatest need of assistance, will miss out on important development opportunities. An understanding of the emergence and composition of CBOs is thus of major policy interest.

Recently, Arcand and Fafchamps (2008) investigated CBO membership and co-membership, i.e., who is linked to whom as a result of belonging to the same CBOs, in Senegal and Burkina Faso. They found that more prosperous members of rural society were more likely to belong to CBOs, that members of ethnic groups that traditionally raise livestock rather than focusing on the cultivation of crops were less likely to belong to CBOs, that CBO membership was assortative on wealth and ethnicity, i.e., the wealthy tend to group with the wealthy and the poor with the poor and different ethnic groups tend not to group together. These are precisely the sort of group formation patterns that ought to be of interest and potential concern to development practitioners.

However, in common with much of the larger and rapidly growing literature on social networks supporting risk and information sharing within small agrarian communities in Africa (for examples of recent contributions see: De Weerdt, 2004; Dekker, 2004; Udry and Conley, 2004; Fafchamps and Gubert, 2006; Krishnan and Sciubba, 2009), Arcand and Fafchamps (2008) rely on cross-section data. Thus, while they provide vital descriptive information on group composition, they are unable to satisfactorily address issues of causality. Specifically, they cannot tell us whether

similarities cause people to associate with one another or association causes people to become more similar.[1] When the effects of gender or ethnicity on who groups or associates with whom are under consideration, this causal ambiguity does not arise; associating with women or members of a particular ethnic group cannot make one more female or more of that ethnic group. However, when the characteristics of interest are income, wealth, and prosperity broadly defined this causal ambiguity needs to be resolved. Further, at the level of the village or community, cross-section data does not facilitate the identification of causal effects running from village or community composition to CBO formation and composition and, in this case, the problem could apply not only to mutable variables such as wealth but also, via selection effects, to immutable individual characteristics such as gender and ethnicity.

In this empirical contribution to the literature, we obviate these concerns by focusing on data from a *de facto* quasi-experiment resulting from actions taken over a quarter of a century ago by the, then, newly formed Zimbabwean government. After the Zimbabwean war of independence in 1980, many people displaced by the fighting were resettled in new villages. These resettled villages were created by government officials selecting households from lists of applicants. Thus, unlike traditional villages, these brought together households that were typically unrelated to and unacquainted with each other, often not even belonging to the same lineage, and diverse in terms of wealth.[2] Yet, in order to survive and prosper, the inhabitants of these villages had to solve various problems of collective action relating to natural resource management, indivisibilities in inputs to agrarian production, inadequate access to financial and other services, and the management of risk and uncertainty.

To varying degrees, the fifteen villages that we study addressed these problems by setting up CBOs. Thus, using data on the geography of the newly formed villages, the sparse networks of kinship and lineage between the households settled together and the characteristics of the households at the time of their resettlement we can investigate CBO formation, who groups and who groups with whom, in the knowledge that the groups that emerged could not have had any effect on the characteristics of the groupers. In addition, we can look at how long these initial characteristics affect CBO formation, membership and co-membership.

To do this, we make use of a unique dataset containing information from a panel survey of households that ran from 1983 to 2000, detailed retrospective data on memberships in CBOs collected from the same households in 2000, genealogical data collected in 1999 and 2001, data on lineage collected in 2001 and 2009, and data on the geography of the villages collected in 1999 and

[1] This issue is very clearly illustrated by an example, taken from the work of Snijders (2007): consider social networks among youths and the decision to take up smoking. Are youths forming links with others who then influence them to smoke, or are smokers linking with each other? Put differently, does the link cause smoking or smoking cause the link?

[2] Related household could signal their relatedness when applying and thereby increase their chances of being assigned to the same village. Also, our data indicates that latecomers were often related to existing inhabitants, suggesting some self-selection among latecomers (Dekker; 2004).

2009. The merging, completing and reconciling (each to the extent possible) of these datasets has taken many months of work by both researchers in the field in Zimbabwe and ourselves. To our knowledge this is the first dataset on small farming communities containing detailed information on socio-economic characteristics and such a wide range of intra-village social ties over such a long period of time. The dataset reveals a number of very positive surprises. These resettled communities appear to be not in the least bit elitist. In 1982, by the end of which almost 90 percent of the households in our sample had taken up residence in their new villages, we find evidence of wealthier households forming CBOs serving a variety of economic purposes and poorer households tending not to engage in CBOs. However, by 1983 these effects had disappeared. This is consistent with wealthier households initiating the formation of CBOs, possibly because, for them, land clearance, crop planting, and house building proved easier, and poorer household being invited to join without prejudice as and when their circumstances allowed. We also find that the network of CBO co-memberships is denser in poorer villages, possibly because they had a greater need for organizations that may have helped them address indivisibilities in agrarian inputs and cope with uncertainty, and that this pattern persists throughout the eighteen years, post-resettlement, covered by our dataset. In addition, we find strong evidence *against* the separation of female and male headed households into different CBOs even though there is some evidence that the former tend to be involved in fewer CBOs. Cause for concern is raised only by evidence that those who settled early and those who settled late tend to associate less with one another than those who settled at the same time. There is also weak evidence that non-Zimbabwean households are less engaged. Finally, within these small resettled villages, geographical proximity mattered only in the early years; by 1985 we observe no effect of proximity on who groups with whom, the effects of kinship are occasional and ephemeral and shared lineage has no bearing on CBO co-memberships, while at the level of the community there is some evidence that shared lineage and CBO activity are substitutes.

The remainder of the paper is arranged as follows. In section 2 we present a summary of the theories that might apply to CBO formation in resettled villages and an empirical model specification that allows us to distinguish between these theories. In this model co-memberships in CBOs are a function of geographical, social, and economic proximities. In section 3 we describe our data sources, samples and definitions in more detail. In section 4 we present descriptive statistics with particular attention being given to the evolution of the network of CBO co-memberships between 1980 and 2000 in each of the fifteen villages in our sample. In section 5 we present the results of estimating an extensive series of regressions corresponding to the specification presented in section 2. In section 6 we present a circumspect (owing to the fact that there are only fifteen villages in our sample) but nevertheless highly informative analysis of CBO co-membership at the village-level. In section 7, armed with new insights from the village-level analysis, we return to the dyadic analysis and investigate what happens when we divide the sample according to one specific, village-level characteristic. Finally,

in section 8 we discuss our findings and consider why they differ from those of Arcand and Fafchamps (2008) and what this implies for the generality of each.

2. Theoretical framework and empirical specification

CBOs provide a basis for collective action, in part, because their individual members trust one another. That trust can originate from many sources. One source, common to all of the households in each of the resettled villages in our sample, would have been the prospect of a future in close proximity to and interacting with one another. This prospect would have generated a need for each individual and household to develop and maintain a reputation for trustworthiness that, combined with self interest, may have been sufficient to support trust and reciprocation. This hypothesis was articulated by Posner (1980) and subsequently formalized by Coate and Ravallion (1993).

However, there are a number of factors that may have rendered it more or less costly for some households to start associating with one another as compared to others. First, as pointed out by Arcand and Fafchamps (2008) and others before them, pre-existing kinship ties may have been associated with trust-reinforcing altruism.[3] Second, the discovery of shared lineage may have provided a basis for association. Third, similarities in terms of socio-economic characteristics such as age, household composition, and wealth may have reduced the costs of striking up an acquaintance upon which, initially, trust and, then, more valuable forms of association could have been built. Fourth, geography could also have had a bearing on these costs, with physical proximity initially increasing the frequency of contact by chance and, latterly, reducing the costs of intended contact. Further, and not alluded to by Arcand and Fafchamps (2008), households' time of arrival in the villages may have had a bearing on notions of belonging and rights to common property. Early birds may have shared a sense of pioneering camaraderie. Later, this may have been augmented by feelings of resentment towards latecomers who would have brought extra pressure to bear on shared resources and could have been viewed as free riders on collective actions embarked upon, sustained and, thereby, strengthened prior to their arrival.

Turning to the benefits of setting up CBOs, these too may have varied across households and villages. Poorer households would have found indivisibilities in agricultural inputs harder to overcome on their own. For example, a rich household could afford a ploughing pair of oxen, a less rich one could afford a ploughing pair if they were prepared to do without some other input or sacrifice some consumption, but a poor household acting alone would have difficulty affording a ploughing pair. Poorer households would have also had a greater need for informal insurance via risk pooling.

[3] The theoretical link between kinship and altruism was first established by Hamilton (1964). For non-human species there is now a considerable body of evidence supporting Hamilton's hypothesis (Brembs 2001).

The benefits associated with setting up CBOs will also depend on whether there are alternative mechanisms available for addressing collective problems and opportunities. CBO membership is a way of signalling a commitment to a common cause. Defined membership fees or dues (in money or in kind) can reinforce this by acting as a material pre-commitment to that cause. However, collective agreements can also be enforced via kin- or lineage-based mechanisms involving well-established behavioural norms and both lateral and hierarchical means of enforcement. For these kin- and lineage-based mechanisms to have been effective bases for collective action in the resettled villages, the kin or lineage networks would have had to have been sufficiently dense. This would have been unlikely in the case of kin as settlers were rarely to be settled with their close kinfolk. However, given the tendency for the authorities to draw the resettlers destined for any given new village from the surrounding areas, it is possible that the lineage network in some villages would have been sufficiently dense. In a previous non-dyadic analysis of some of the data presented here alongside comparable data collected for a sample of six traditional villages Barr (2004) found that households maintained more memberships in civil social organizations if they were located in more ethnically diverse villages. Note that this leads to a predicted negative relationship between CBO activity and the lineage network. However, also note that this negative relationship is most likely to be observed at the village level rather than at the dyadic level.

All of the potential dyadic-level effects described above can be captured in a dyadic model of group or network formation of the form proposed by Fafchamps and Gubert (2007) and Arcand and Fafchamps (2008). Using network notation the model takes the general form $m_{ij} = \lambda(x_{ij})$, where m_{ij} equals the number of co-memberships in CBOs that *i* and *j* share and is a function, $\lambda(.)$, of the vector of factors x_{ij}. The vector x_{ij} includes both the factors that affect the number and size of the groups that *i* (or *j*) belong to and the factors that affect the likelihood of *i* and *j* belonging to the same group or groups.

When estimating dyadic regressions the main technical difficulty is in obtaining consistent standard errors owing to the interdependencies across the m_{ij}s. This interdependence could tempt one into basing the estimation on a joint maximum likelihood function. However, there are several problems with this approach. First, the estimation would require solving a complicated optimization problem with multiple integrals. This could, in principle, be achieved using the Gibbs algorithm, but at a non-negligible cost in terms of programming. Second and more importantly, writing down the joint likelihood function would force the researcher to specify the functional form of the interactions between observations. Theoretically, this could improve efficiency, but it could also result in inconsistent estimates if the specified form of the interaction were wrong. So, we opt for one of the simpler and more transparent approaches being applied to analyses of this type. Included among these approaches, the most extensively used are quadratic assignment permutation (QAP), developed

by Krackhardt (1987), extensions thereof, and the dyadic robust standard error regression approach developed by Fafchamps and Gubert (2007).[4] We use the latter primarily because, unlike QAP and its extensions, it allows for the pooling of data across socially unconnected populations.

The estimation of dyadic models requires some care regarding the way regressors are incorporated (Fafchamps and Gubert; 2007). In our case, the network matrix $M = [m_{ij}]$ is symmetrical; if *i* belongs to the same CBO(s) as *j*, *j* must also belong to the same CBO(s) as *i*, i.e., $m_{ij} = m_{ji}$. Hence, to ensure that $E[m_{ij}] = E[m_{ji}]$ regressors must enter the model in symmetric form. This condition is satisfied by models of the following form:

$$m_{ij} = \beta_0 + \beta_1 l_{ij} + \beta_2 g_{ij} + \beta_3 |z_i - z_j| + \beta_4 (z_i + z_j) + v_{ij} + \varepsilon_{ij}$$

where l_{ij} is a vector of network linkage variables such as kinship and shared lineage, g_{ij} is the geographical distance between *i* and *j*, z_i is a vector of characteristics such as the wealth of *i* and when *i* arrived in the village, v_{ij} is a vector of village fixed effects, ε_{ij} is the dyadic error term, and β_0, β_1, β_2, β_3 and β_4 are the coefficients to be estimated.

A significant positive (negative) element in β_1 indicates that the corresponding network linkage increases (reduces) the number of co-memberships that *i* and *j* share. A significant negative β_2 indicates that the number of co-memberships that *i* and *j* share declines as the geographical distance between them increases. A significant negative (positive) element in β_3 indicates that the number of co-memberships that *i* and *j* share is greater the more (less) similar they are along the corresponding dimension. Significant positive (negative) elements in β_4 identify characteristics associated with more (less) CBO activity, i.e., more CBO memberships and/or memberships in larger CBOs.[5] Finally, if the village fixed effects, v_{ij} , are jointly significant it indicates that there are village-level differences in the density of the CBO networks. To the extent that l_{ij}, g_{ij}, and z_i affect group formation and vary across villages, this will be captured in the village fixed effects and this could reduce the significance of the coefficients β_0, β_1, β_2, β_3 and β_4. However, as alluded to above with respect to lineage, there is no reason why one should expect a particular factor to have a similar effect at both the level of the dyad and the level of the village and, if they do not, the inclusion of the village fixed effects could actually increase the significance of the coefficients β_0, β_1, β_2, β_3 and β_4.

Our analysis involved the estimation of a series of models of this form, some taking m_{ij} as defined above as the dependent variable and others taking $d_{ij} = 1$ if $m_{ij} > 0$ and $= 0$ if $m_{ij} = 0$ as

[4] The P2 Logistic model (Lazega and van Duijn; 1997) is another, frequently used specification. However, it is designed specifically for the analysis of directed ties. Co-memberships are undirected by definition.

[5] To see why, suppose that individuals with large values of *z* join more and/or bigger CBOs. This implies that $E[m_{ij}]$ is an increasing function of $z_i + z_j$ and hence that β_4 is positive.

the dependent variable. In the case of the latter, we estimate linear probability models.[6] We estimate one model taking each of these dependent variables for each and every year starting with 1982 and ending with 2000. In every case, the regressors relate to the dyadic baseline, which for each dyad was set at the point in time when the second (or later) household resettled. All of the regressors used are introduced and described in detail in the following section.

Following on from this dyadic analysis, we also conduct a series of village-level linear regressions. Here, we constrained by the number of observations; there are only 15 villages in our dataset. This could have serious implications for the power of our analysis. However, as we see below, one important effect is very well identified nevertheless.

3. Data sources, samples and definitions

Resettled households started to arrive in the fifteen villages included in our sample in 1980 (see Table 1). The inflow peaked in 1981 and almost 90 percent of the households in our sample had arrived and settled by the end of 1982. In subsequent years there were a few more arrivals and even fewer departures. However, in general, the composition of the villages in terms of the households residing therein was very stable. Some household heads passed away during the period, but in the large majority of cases the rights to farm their fields, use common grazing lands, and reside in their homesteads passed to members of their family, often (and unusually in sub-Saharan Africa) to their wives if they were alive and otherwise to their sons. In all such cases, we do not equate the death of the household head with the departure of the household. Only when a homestead and lands were vacated by the family, either following the death of a household head or for some other reason, does it show up as a departure in our data. A total of 504 households are represented in the dataset with, at most, 499 appearing in the villages at any one time. Village sizes vary markedly with the smallest containing only thirteen households throughout most of the time period covered by our data and the largest reaching a maximum of 52 households in 1998 (See Table 7).

All of the standard socio-economic variables that we use in our analysis were initially drawn from the Zimbabwe Rural Household Dynamics Study (ZRHDS). The ZRHDS started in March 1983 and, in the villages upon which we focus, aimed to survey all of the households present at that time.[7] From this first round of the ZRHDS we draw data on the livestock holdings of the households on arrival in the villages, the ages, sex and education of the household heads, the headcount sizes of the households on arrival, and whether the households had previously (and recently) resided in a village placed under curfew by the British during the war. This last variable can be interpreted as a rough proxy for the intensity of the fighting in the area in which the household had previously resided.

[6] Ideally, we would have estimated Logits. However, in several cases the dyadic robust standard errors turn out to be unstable when the logit is applied.

[7] Kinsey, Burger and Gunning (1998), Gunning, Hoddinott, Kinsey and Owens (2000), and Hoogeveen and Kinsey (2001) discuss the ZRHDS surveys in detail.

We use the livestock holdings of the settlers as our indicator of initial wealth. Livestock holdings are measured in oxen-equivalents, with weights based on market prices in 1995 being applied to all the different types of livestock held before summing to a total. Livestock keeping in Zimbabwe has a different connotation to that described by Arcand and Fafchamps (for West-Africa where ethnic groups that traditionally keep cattle, such as the Fulani, live outside the village to facilitate access to pastures and minimize crop destruction. In Zimbabwe, and certainly in our research areas, livestock is kept by people living in the villages, usually as a store of wealth and a productive asset and sometimes as part of a mixed farming system.

Subsequent rounds of the survey between 1987 and 1998 revisited the households interviewed in 1983 and, as a consequence, did not capture the late arrivals to the villages. The late arrivals were discovered by us in 1999 and were, in that same year, enumerated in a single brief but comprehensive round of the survey in which the respondents were asked to recall their time of arrival in the village and some of the characteristics of their households at that time.

Table 2 presents the livestock holdings on arrival and the characteristics of the household heads residing in the villages in 1980, 1982, and 1984.[8] The average household had a livestock holding of 3.2 at the time of their resettlement. This is equivalent to a pair of ploughing oxen, one milking cow and a few chickens. However, 38 percent of the households arrived with no livestock at all and would have faced the prospect of clearing land and cultivating at least a first set of crops without a ploughing pair of their own.[9] The age of the average household head in 1980 was 38 years and the figures for subsequent years indicate that later arrivals tended to be a little older. The average household size was between five and six members in 1980 with the figures for subsequent years indicating either that later settlers had larger households or that settlers expanded their households after resettlement either through procreation or in-migration.

The data on CBOs were collected during a six-week period of intensive fieldwork in 2000 by Barr (2004) and a small team of field researchers.[10] The objective from the outset was to collect comprehensive data on civil social activity in both the current time period and the preceding two decades. So, considerable thought went into the design of a fieldwork protocol that would maximize data quality. Using the Local Level Institutions Study (World Bank, 1998) as a starting point, we

[8] Note that we do not report on the education of the household heads. This is because such data is missing for a significant proportion of the households in our sample, 12 to 40 percent depending on the year. In part, this is because, while others family members can recall the sex and calculate the age of prior household heads, in many cases they would have never known their level of education. The data we do have indicates that the average household head had around 6 years of education, i.e., had been to primary school.

[9] There are no tractors in the villages even today.

[10] Civil society data was also collected in seven other resettled villages and six traditional villages. However, in the former the ZRHDS included only random samples of households, rendering it unsuitable for dyadic analysis, and in the latter only the year 2000 was enumerated. Barr (2004) presents a non-dyadic analysis of the full dataset, focusing on why the resettled villages appeared not to be converging on the levels of civil-social activity observed in the traditional villages.

designed a data-generating protocol with two main components.[11] The first component involved a meeting in each village attended by one adult member of every household in the village (a small number of households were unable to send a representative). During this meeting, a list of all the non-political groups (clubs, religious groups, unions, revolving savings and credit associations, burial societies, etc.) that had ever existed in the village or to which village members had belonged was drawn up.[12] One field researcher led the discussion among the villagers while several others wrote independent lists of the groups mentioned. A master list was constructed at the front of the meeting and was repeatedly corroborated by the villagers and researchers who were sitting among them picking up relevant information in "side conversations". Thus, for each village, an exhaustive list of groups that either existed at the time of the meetings or had existed at some time during the history of the villages was constructed.

These lists became the code sheets for the next stage of the data collection, which involved the recording of individual household's civil social histories. To ensure that the recall was as accurate as possible, instead of interviewing household representatives in isolation, we constructed a responding panel for each household. These panels usually included neighbours as well as household members. The panel interviews often took place while refreshments were being served at the end of village meetings relating to other research tasks or while menial tasks such as shelling ground nuts or beans were being undertaken by groups of neighbours. This approach proved particularly valuable when constructing histories for households in which the original settlers had died, leaving children or other family members too young or too late into the resettlement villages to remember the early years. This approach also allowed us to construct histories for the few households that no longer resided in the villages and thereby construct complete year-by-year snapshots of the network of civil social activity in each village. Generally, we found women in their 40s and 50s to be the most reliable panel members. Men recalled male activity with a high degree of accuracy, but provided inaccurate data on both the current and past civil social activity of women in their households. The existence of a "year zero", i.e., a point in time when the village was created *ad nihilo* and at which there was absolutely no civil society, provided an important anchor for the recall exercise. Natural dating techniques, principally involving references to drought years, were also used.

All of these carefully considered protocol details notwithstanding, it is important to bear in mind that we were asking respondents to recall events during the preceding two decades and, in some case, not only for themselves but for absent others. This being the case, all of the analysis presented below needs to be viewed as jointly testing the theories outlined above and the data generating approach. The only reason why problems with recall might lead to spurious significant results is if

[11] The fieldwork instruments are available from the authors.
[12] Owing the instability of the political environment in Zimbabwe at the time of the fieldwork, we decided not to ask about political parties and to record no information about them if they were mentioned.

respondents filled gaps in their memory in with guesses based on some shared theory. The likelihood of a shared theory existing seems slim. Problems with recall leading to noise and, hence, inflated standard errors on coefficients are far more likely and, for this reason, the estimates presented below are likely to be conservative.

The analysis presented here focuses on co-memberships in CBOs serving an economic purpose. These include funeral societies, ROSCAs, a diverse range of cooperatives focusing on specific agricultural activities, income-generating or cost-cutting craft activities, and a few skill-sharing and generating activities, most often relating to agricultural practices and adult literacy. We exclude organizations which, on closer inspection, turned out to be administrative devices for the various crop marketing boards and corporations that interact with the villagers, supplying them with inputs and purchasing their cash-crop outputs. We also exclude CBOs serving a social purpose, principally choirs, dance groups, and football and netball clubs, because a number of tests indicate that the recall data on these are of considerably poorer quality and, to the extent that the data can be analysed, that social CBOs are subject to different determining forces.[13] Finally, we exclude religious organizations.[14]

Each line of questioning on the instrument used to collect the household membership data started with the question "Has anyone from this household ever regularly attended the meetings of [*the name of a group or association*]?" Then followed a series of questions about who attended, when the first attendee started, when the last attendee stopped, attendance rates, contributions, and leadership. Most importantly for us here is the fact that the precise identities of the attendees were not collected; we only know whether the head, men, women, or male or female children attended and, when a mixture attended we do not know who was first and last. This combined with the fact that the survey data on initial wealth is measured at the household level, means that an analysis of household interconnectedness rather than individual connectedness is the obvious starting point. Thus, for the remainder of the paper m_{ij} will be defined as the number of CBOs in which both household i and household j have at least one member and d_{ij} will be set equal to one when at least one member of household i and one member of household j belong to the same CBO.

The data on kinship was collected in 1999 and 2001 using a specifically designed social mapping exercise undertaken by village focus groups involving at least one representative from each household residing in each village (Dekker 2004). The years of settlement, marriages, divorces and

[13] The quality of the data was first brought into question by the finding that the social CBOs rarely drew their memberships from more than a couple of households and often from only one. Further, co-memberships in social CBOs derived from these data did not predict who would choose to group with whom under a variety of circumstances in a lab-type experiment conducted in 2001. We suspect that the difference in quality between the economic and social CBO data is owing to the relatively ephemeral nature of social CBOs and to the relative importance the economic CBOs.

[14] Initially, we considered including religious co-memberships as a regressor in the analysis. However, we do not have data on the households' religious affiliations at the time of resettlement and know that at least some individuals changed religious affiliations during the enumerated period. Further, a dyadic analysis of religious co-memberships indicates that, in the early years, they are associated with geographical proximity and, given that the latter was exogenously determined, we can only conclude that the former were endogenous.

deaths necessary to construct the panel of kinship ties were obtained from the social mapping exercise, marriage and household roster information from the panel survey and death registers collected separately in 2000 (see Barr and Stein, 2008). Missing information was filled in using natural dating techniques by experienced field researchers in 2009.

In the analysis, the relatedness of households *i* and *j* is set equal to the maximum Hamilton's ratio between any member of household *i* and any member of household *j*. Hamilton's ratio is specifically a measure of genetic relatedness. However, it also captures marriage relations in the sense that if a daughter of one household marries the son of another and, in accordance with local tradition, moves to the house of the son, she remains related to her father and mother and the Hamilton's ratio between the two households would equal 0.5, its maximum possible value assuming no inbreeding. Although a full panel of kinship ties is available, here we use the initial relatedness only, that is the kinship tie between two households in the year the last household in the dyad settled. In the previous example, this means the Hamilton's ratio between *i* and *j* only equals 0.5 if the marriage took place before the latest of the two households settled.

The data on lineage was collected in nine of the villages in 2001 and in the remaining six in 2009. Following consultations with a number of experienced local field researchers, we chose to collect data on totems of the household heads and their spouses. An individual's totem is made up of three elements, their Mutopu, Dzinza, and Chidawo. In the analysis below, we use the Dzinza, which provides a geographical indication of the clan lands upon which an individual's great-grand parents lived. More specifically, in our analysis household *i* is indicated to have a shared lineage with household *j* if household *i's* head's or spouses' Dzinza matches household *j's* head's or spouses' Dzinza. This variable captures co-membership in a very extended family network. Such an extended family network could be relevant especially in the absence of close kinship ties when these extended family ties are ***(check Bourdillon etc) This exercise also revealed that almost seven percent of the households in our sample were of non-Zimbabwean origin.

For nine of the villages, the geographical data was extracted from maps sketched in 1999 as part of the kinship mapping exercises. Originally, they were not intended to act as a source of geographical data. So, in 2009, when we decided that we needed such data, we had to estimate the scale of the maps with reference to the size of the homestead plots officially assigned to each household in every village. Having established that this exercise yielded useful data, we dispatched a small team of local researchers to the remaining six villages to draw similar sketch maps and to measure a few distances as a check on our approximations of the scales of the maps. In the analysis presented below we use the estimated distance in kilometres between each pair of households.

We use the following set of regressors in the dyadic regression analysis:

- Difference in livestock holding on arrival: difference between household *i*'s livestock holding at the time when it settled and household *j*'s livestock holding at the time when it settled

- Sum of livestock holdings on arrival: household *i*'s livestock holding at the time when it settled plus household *j*'s livestock holding at the time when it settled
- One female headed
- Number female headed
- Difference in age of household heads: Difference in ages of heads of households *i* and *j* at time of arrival of second
- Sum of ages of household heads: sum of ages of heads of households *i* and *j* in 1982 irrespective of where they are at that time
- One non-Zimbabwean
- Number non-Zimbabwean
- One previously lived in a curfew village
- Number that previously lived in a curfew village
- Difference in arrival time: difference in settlement date (in years) between households *i* and *j*
- Sum of arrival times: sum of *i* and *j*'s settlement dates each measured in terms of years since the start of the resettlement programme, i.e., 1980=0, 1981=1, etc.
- Genetic relatedness: the maximum Hamilton's ratio between all possible pairs of individuals including one from household *i* and one from household *j* at time of arrival of second household
- Shared lineage (definition above), and
- Geographical distance (km): estimated distance between homesteads of households *i* and *j*.

The two other dyadic variables we could have included without severely restricting our samples are the difference in the size (head count) of households *i* and *j* at time of arrival of second and sum of sizes of households *i* and *j* at time of arrival of second. However, in the context of Zimbabwean resettlement schemes, household size might also be an indicator of household prosperity and is highly correlated with livestock holdings. So, for this reason we choose to exclude it form the analysis, relying on the latter as our sole proxy for wealth and prosperity.

4. Descriptive statistics

Across the fifteen villages, our dataset alludes to 129 different CBOs. In any given year, if we focus on those CBOs that existed in that year, 13 to 15 households report a membership in the average CBO. Table 3 summarizes the network of co-memberships in these 129 CBOs year-by-year for both the full sample of within-village household dyads and for the dyadic sample upon which our dyadic regression analysis is based, i.e., for which we also have sufficient survey data. For each of these samples the Table reports the size of the sample in each year, the percentage of dyads that share at least one CBO co-membership and the number of CBO co-memberships shared by the average dyad. Thus, we see a steady rise in the density of the CBO co-membership network over time. In

1983, 58 percent of the household dyads shared at least one CBO co-membership. By 2000 that figure had risen to 84 percent. And over the same period the average number of co-memberships increased from just under one to just under two. There is no discernable difference between the full sample and the sample for which we have survey data.

These figures are consistent with a high level of CBO activity and a high degree of interconnectedness. However, Figures 1 and 2 reveal considerable variation across villages. Figure 1 plots the evolution of the proportion of household dyads sharing at least one co-membership in each of the villages over time. Thus, we see that, while seven villages had fully connected networks of CBO co-membership by 1984, five were struggling to reach a density of 20 percent by 1985. Indeed, one village had no CBO activity until 1991. Finally, the ranking of the villages in terms of the density of their networks of CBO co-memberships remain fairly stable over time. Figure 2 plots the evolution of the average number of co-memberships in each of the villages over time. This figure tells a similar story, with each village assuming a very similar location in the ranking.

We summarized the characteristics of the resettled households when describing our sample in Table 2. The corresponding characteristics of the household dyads are presented in Table 4 along with the distribution of the dyads across the villages and mean genetic relatedness of each dyad, percentage of dyads having a shared lineage and the mean geographical distance between the homesteads of the dyad. As expected, the mean genetic relatedness is very low. However, thirteen percent of the dyads share a lineage. The homesteads in the average dyad are one third of a kilometre apart. This short distance is in line with the planned set-up of the resettlement villages, with all residential plots clustered together and surrounded by arable land, and contrasts with the traditional set up of villages in Zimbabwe where homesteads are scattered around the village territory interspersed with the arable fields.

5. Dyadic regression results

Table 5 presents the estimated coefficients and corresponding adjusted standard errors for the linear probability models taking at least one co-membership as the dependent variable. In the interest of brevity, this table presents the estimations for 1982, 1983, 1987, 1991, 1995, 1999, and 2000. The estimations for each and every year from 1982 to 2000 can be found in Appendix Table A1 and the point estimates and 90 percent confidence intervals for the most interesting coefficients can be found in Figures 2 to 7.

Table 6 presents the estimated coefficients and corresponding adjusted standard errors for the regressions taking the number of co-memberships as the dependent variable. Again, this table presents the estimations for 1982, 1983, 1987, 1991, 1995, 1999, and 2000. The full set of estimations can be found in Appendix Table A2 and the year-by-year point estimates and 90 percent confidence intervals for two of the coefficients can be found in Figures 8 and 9.

Table 5 and Figures 3 and 4 show that, in 1982, households that were more different in terms of their livestock holdings were less likely to have one or more CBO co-memberships and that households with larger livestock holdings were more likely to be connected in this way. However, by 1983 these effects have disappeared and from then on both of the relevant coefficients remain close to and statistically indistinguishable from zero. Further, these effects are not observed in Table 6, in which the number of co-memberships is the dependent variable. And finally, if the dyadic difference in and sum of household sizes are also included as regressors the coefficients on the livestock variables disappear.[15] This is a weak result, but it serves, first, to convincingly rule out the notion that CBO formation in these villages could have been elitist and, second, to suggest that far from aiming to set up elitist organizations, members of the households that were better off on arrival set up the CBOs that the poorer households, maybe, had no time to set up in the early years and then allowed members of the poorer households to join without prejudice as an when their circumstances allowed.

Table 5 and Figure 5 show that, from 1986 to 1988, that households where more likely to share one or more co-memberships with households that settled at the same or similar times to them. That this effect is observed only seven years after the resettlement programme started suggests that it is being driven by the few households who settled considerably later than the others. Also, it is interesting to note that as time passes the effect is estimated with increasing precision and that its insignificance in 1999 and 2000 is owing to its decline in magnitude. Table 6, where numbers of co-memberships are the dependent variable, presents an almost identical story.

Tables 5 and 6 also shows that in 1987 (the effect observed in 1986 and 1988 as well) later settling households were more likely to be connected to other households via this network than earlier settling households. Viewed in conjunction with the previous finding, this suggests that later settling households either responded to being excluded from the CBOs to which earlier settlers belonged by setting up many of their own but that this, almost competitive, response was short lived, or that they never wish to belong to the CBOs to which earlier settlers belonged and set up their own with initially considerable but waning enthusiasm.

Table 5 and Figure 6 show that, in 1982 and 1983, more geographical proximate households were more likely to share at least one co-membership and that, in accordance with the findings of Gans (1968) and Michaelson (1976), this effect then dwindles. However, the effect appears to remerge in 1997 and grow stronger between 1997 and 2000.

One of the most heartening effects identified by our analysis relates to the sex of the household heads. Table 6 and Figure 8 show that households with heads of different sexes are likely to share more rather than fewer co-memberships and that this effect persists even when, between 1992 and 1997, female headed households, on average, appear to be less well connected via the CBO

[15] The results are robust to the inclusion of household size if the analysis focuses on the eight poorest villages. Section7, below, provides details.

network (see Figure 9). While the corresponding coefficient in Table 5 and Figure 7 is always positive it is rarely significant.

Finally, note that in both Table 5 and Table 6 the village fixed effects are always jointly highly significant. Indeed, these fixed effects alone explain 63 and 60 percent of the variation in the dichotomized and undichotomized dependent variables respectively in 1983 and, still, 24 and 32 percent respectively of the variation in 2000. Adding the dyad-level regressors improves these percentages by only one or two percentage points.

6. Village-level Analysis

In this section we focus on two village-level dependent variables: the proportion of dyads sharing one or more co-memberships in a CBO, i.e., density of the dichotomized CBO network, in each village; and the average number of dyadic CBO co-memberships in each village.[16] Each dependent variable is defined for each of the years between 1982 and 2000.

Before proceeding with the analysis and especially, because we have only fifteen observations for each year, it is useful at this point to go back over the questions and hypotheses we have that would be consistent with a village-level correlation. First, if wealth varies markedly across villages and relatively rich households are more inclined towards CBO activity, possibly owing to lower opportunity costs, then we would expect to find a positive relationship between village mean wealth and the two types of dependent variables described above. Alternatively, if poorer households benefit more from CBOs and villages vary markedly in terms of mean wealth, we would expect to find a negative relationship. Second, if shared lineage provides an alternative foundation for collective action we would expect to find a negative correlation between the density of the lineage network in each village and the two types of dependent variables described above.

Table 7 presents mean and the standard deviation of the village mean livestock holdings at the time of arrival, the mean and the standard deviation of the densities of the lineage network in the villages and the means and standard deviations of a number of other variables that we will treat as controls. These include the mean age of the household heads in each village, the mean years of education of the household heads (for whom we have data) in each village, the mean household size in each village, the proportion of non-Zimbabweans in each village, the proportion of households previously residing in a village that was subject to curfews during the war, the mean genetic relatedness in each village, the number of economic CBOs in each village, the number of households in each village, and a dummy variable indicating whether each village is located in a southerly cluster rather than in a northerly cluster. The last of these variables is particularly important as it can be viewed as a proxy for both the characteristics of the soil and land in and surrounding the resettled villages, the

[16] An alternative approach would have used the estimated village fixed effects from the regressions presented in section 5 as dependent variables. Doing so yields very similar results and requires more complex language in presentation.

lineages to which the resettled villagers belong and differences in settler selection and the implementation of the resettlement policy and related development activities by government officials. The soil and lands in and around the northern villages is better suited to cash crop cultivation, while those in and around the southern villages is marginal for cash crop cultivation and more suited for small grains and mixed farming. The village-level variables that we use are summarized in Table 7.

Because we have only fifteen village-level observations, we start the analysis with a series of bi-variate correlations. The correlations involving the proportion of dyads sharing one or more co-memberships in a CBO in each village are reported in Table 8. The correlations involving the average number of CBO co-memberships in each village are reported in Table 9.

In Table 8, in all years, the proportion of dyads sharing one or more co-memberships in a CBO is highly significantly negatively correlated with the mean livestock holdings on arrival. The remarkable strength of the correlation, despite the size of the village-level sample, is also evident in year-by-year scatter plots. Figures 10 and 11 present the scatter plots for 1982 and 2000 respectively. In the early years, it is also highly significantly negatively correlated with the density of the lineage network, although the strength of this correlation declines over time and is insignificant for 1996 onwards. In addition, it is significantly negatively correlated with the southerly cluster dummy variable, although only up until 1996 and, in the early and late years, negatively with the average age of the household heads.

Table 9 shows similar but, generally, weaker correlations for the average number of CBO co-memberships in each village. Again, in all years, the CBO variable is significantly negatively correlated with the mean livestock holdings on arrival, although in later years the correlation is only significant at the ten percent level. The negative correlation with the density of the lineage network ceases to be significant in 1989, and the negative correlation with the southerly cluster dummy variable becomes insignificant in 1987. The negative correlation with the mean age of the household heads is absent in the early years by stronger in the later years.

The negative correlation with the density of the lineage network supports the hypothesis that, in these villages at least, shared lineage and CBO activity are alternative or substitute bases for collective action. This accords with the reported responsibility towards clan members and is in line with earlier findings by Barr (2004). The negative correlations with the mean livestock holdings are consistent with the hypothesis that poorer villages engage in more CBO activity because it is of greater value to them. This is interesting. So, to test the robustness of the negative correlation between the CBO network and mean livestock holdings, we ran a series of simple OLS regression taking the proportion of dyads sharing one or more co-memberships in a CBO as the dependent variable and the mean livestock holdings on arrival, mean household head ages, the density of the lineage network, and the southerly cluster dummy as the regressor. One regression was run for each year. Table 10

reports the results. The coefficient on the mean livestock holding is significant in every one of the regressions, while the coefficients the other regressors are never significant.

7. Further exploration into the effects of wealth on CBO formation

The dyadic analysis in section 5 revealed that, in 1982, the relatively wealthy households in our sample were engaging in more CBO activity, while the poor appeared to be excluded. However, by 1983 this effect had disappeared, suggesting that, when they were ready, the poor were free to join without prejudice. In contrast, the village-level analysis in section 6 revealed that, from 1982 to 2000, poorer villages engaged in more CBO activity; a finding that is consistent with CBOs being of greater value to the poor.

In a bid to reconcile these two apparently conflicting findings, we divided the dyadic sample analyzed in section 5 into two sub-samples, one relating to the eight poorest villages and one to the seven richest villages in our sample, and reran the dyadic analysis on each in turn. This reveals that the significant positive coefficient on the sum of the households' livestock holdings on arrival is driven by the poorer villages. Indeed, if we focus only on these villages, this effect is observed not only in 1982 but also in 1983, 1984 and 1985. Further, these results are robust to the inclusion of the difference in and sum of household sizes as additional regressor. In the sub-sample from the richer villages the sum of the households' livestock holdings on arrival is insignificant in all years.

This additional finding indicates that it was the relatively well off in the poorest villages that were the most active in setting up the CBOs. Maybe they realized that, as the richest inhabitants in these new villages, they would be expected to offer and provide support for the others in times of need and saw the setting up of CBOs as a way of helping their new neighbours to help themselves, thereby, reducing or managing the future burden on themselves.

8. Discussion and conclusions

Recent years have witnessed a renewed policy interest in community-based development and CBOs. The extent to which CBOs can contribute to effective and equitable development strongly depends on where they do and do not emerge and their socio-economic composition. Given the cross-sectional nature of most work in this field, recent studies have provided descriptive information on CBO composition, but have been unable to satisfactorily address issues of causality, i.e. whether similarities cause people to associate with one another or association causes people to become more similar and whether community composition affects CBO formation and composition. In this paper, using unique data on the geography of newly formed villages, the networks of kinship and lineage ties between the households settled together and the characteristics of the households at the time of their resettlement we investigate who groups with whom, knowing that the groups that emerged could not

have had any effect on the characteristics of their members, as the members had limited prior experience with and knowledge of one another.

In these Zimbabwean villages, we do not find any evidence that CBOs are elitist; although the analysis suggests members of households who were wealthier at the outset were more actively involved in the setting up of CBOs, possibly because they had the time and means to do so, poorer households joined in when their circumstances allowed them to do so, a few years after resettlement.

In the first few years after resettlement geographical proximity is another determinant of CBO co-membership. The effect then declines, but re-emerges in the late 1990s. Although female headed households are less likely to connect via the CBO network at some times, they are not excluded or choose not to exclude themselves from associating with male-headed households: in fact they are more likely to share memberships with them. People who arrive considerably later tend to either be excluded from or choose not to join existing CBOs in the village and appear to set up new CBOs with other late settlers instead.

In the dyadic analyses we find significant and very strong effects of the village of residence on the likelihood of sharing memberships in CBO and in a village level analysis we find that the density of the dichotomized CBO network is negatively related to the mean livestock holdings on arrival and that this effect persists throughout the two decades for which we have data. This indicates that villages comprised of poor settlers are more active in building new ties.

With the exception of the positive effect of geographical proximity, we fail to replicate any of Arcand and Fafchamps' (2008) findings. We found no effect of shared lineage on who groups with whom and only weak evidence of the density of the lineage network affecting CBO formation at the village level. This was as close as we could get to an analysis of the effects of ethnicity on CBO formation, membership and co-membership as our research population is ethnically relatively homogeneous; most of the households are Shona albeit there is a fair representation of foreigners, the former farm labourers on the previously white-owned commercial farms. Further, in Zimbabwe, there are no clear ethnic distinctions between cattle keepers (such as the Fulani) and agriculturalists as is found in many West-African countries. To the extent such a distinction can be made in Zimbabwe, it is between the Ndebele and the Shona, but the former originate from the south-western and western parts of the country and are not represented in our research population.

We also find very little evidence that more fortunate households are more likely to join CBOs and that there is assorting into CBOs on the basis of fortune. We observe these tendencies only directly after resettlement when the CBOs were being established and only in relatively poor villages. Further, it is in these poorer villages that the network of CBO co-membership is densest, potentially owing to a greater need for collective action in these communities.

The greatest strength of our analysis is that it is based on data derived from a quasi-experiment. This being the case, we can safely assume that the measured characteristics of the

households and villages are determining the structure of the CBOs and not vice versa. However, this causal clarity comes at a cost as, by necessity, the study focuses on a very special type of village, i.e., ones that were created by government officials selecting and clustering applicant households. This raises a question – to what extent are our findings applicable beyond the bounds of Zimbabwe's first resettlement scheme? Put another way, what if anything do our findings tell us about CBO formation in African villages in general? Most African villages form by people joining hamlets spearheaded in the bush by one or two households. In many cases, the late comers to these communities would have shared ties of kinship with the initial pioneers. However, we know that "stranger" households also join such emergent communities (see Dekker (2004) for more on the formation of non-resettled villages in Zimbabwe). So, some of our findings, especially those relating to when, in the history of the village or hamlet, each household settled, are likely to be of general interest.

Our other findings, especially those suggesting that CBO activity is not elitist and that even members of female headed households, a group often excluded from village life in developing countries, are not excluded might best be taken as evidence of what is possible when villages are created rapidly by government officials. In a world where refugee status is on the increase, so too are settlements of this very type. In the case studied here the resettlement followed a victory over a colonial regime and, by many of those resettled, would have been perceived as the division of the spoils of war in accordance with the socialist ideals of the new nation and an opportunity to start afresh. Refugees are unlikely to perceive their own predicament in such a positive light. However, they could be encouraged to perceive it as an individual and collective fresh start.

References

Arcand, Jean-Luis. and Marcel. Fafchamps (2008) "Matching in Community-Based Organizations" mimeograph.

Barr, Abigail (2004), "Forging Effective New Communities: The evolution of civil society in Zimbabwean resettled villages" *World Development.*

Barr, Abigail and Mattea Stein (2008), "Status and egalitarianism in traditional communities: An analysis of funeral attendance in six Zimbabwean villages", CSAE working paper WPS/2008-26.

Brembs, B. (2001), "Hamilton's Theory", in *Encyclopaedia of Genetics*, Academic Press.

Coate, Stephen and Martin Ravallion (1993), "Reciprocity without commitment: characterization and performance of informal insurance arrangements" *Journal of Development Economics*, 40, 1-24.

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

De Weerdt, Joachim (2004) "Risk-sharing and Endogenous Network Formation" in Dercon S. (ed) *Insurance Against Poverty.*

Dekker, Marleen (2004), *Risk, Resettlement and Relations: Social Security in Rural Zimbabwe.* PhD Thesis, Vrije Universiteit. Amsterdam: Thela Thesis.

Edwards, M. and David Hulme (1995), *Non-Governmental Organizations: Performance and Accountability. Beyond the Magic Bullet*, London: Earthscan.

Krishnan, Pramila and Emanuela Sciubba (2009) "Links and Architecture in Village Networks" *The Economic Journal*, 119(537), pp. 917-949.

Fafchamps, Marcel (2006), "Development and Social Capital" *Journal of Development Studies*, 42(7).

Fafchamps, Marcel and Flour Gubert (2007). "The Formation of Risk Sharing Networks" *Journal of Development Economics*, 83(2):326-50.

Gans H. (1968), *People and plans: essays on urban problems and solutions*. NewYork: Basic.

Gunning, Jan-Willem, John Hoddinott,, Bill Kinsey, and Trudy Owens, (2000). "Revisiting Forever Gained: Income Dynamics in the Resettlement Areas of Zimbabwe, 1983-1997" *Journal of Development Studies*, 36(6).

Hamilton, W. (1964). "The Genetical Evolution of Social Behavior" *Journal of Theoretical Biology*, 7(1), 52.

Hoogeveen, J. and Kinsey, B. (2001). "Land Reform, Growth and Equity: A Sequel" *Journal of Southern African Studies*, 27(127), 36.

Kinsey, B., Burger, K. and Gunning, J. W. (1998). "Coping with Drought in Zimbabwe: Survey Evidence on Responses of Rural Households to Risk" *World Development*, 25(1), 89-110.

Krackhardt, David (1987), "QAP Partialling as a Test of Spuriousness" *Social Networks*, 9: 171-86.

E. Lazega and M.A.J. van Duijn (1997) "Formal Structure and Exchanges of Advice in a Law Firm: A Random Effects Model". *Social Networks*, 19, p.375-397.

Michaelson, W. (1976) *Man and His Urban Environment: A Sociological Approach*. Reading, MA: Addison-Wesley.

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

Platteau, Jean-Philippe and F. Gaspart (2003), "The Risk of Resource Misappropriation in Community-Driven Development" *World Development*, 31(10): 1687-1703.

Posner, Richard A. (1980), "A Theory of Primitive Society, with Special Reference to Law" *Journal of Law and Economics*, XXIII: 1-53.

Putnam, Robert D. (2000), *Bowling Alone*, Simon and Schuster, New York.

Snijders, Tom (2007), "Statistical methods for social network dynamics" Oxford University, mimeograph.

Udry, C.R. and Conley, T.G. (2004). "Social networks in Ghana" Economic Growth Center Working Paper No. 888, Yale University.

World Bank (1998). "The local level institutions study: Program description and prototype questionnaire" World Bank Local Level Institutions working paper No. 2. Washington, DC: World Bank, Local Level Institutions Study Group.

Figure 1: The density of the economic CBO network (dichotomized) over time, village-by-village

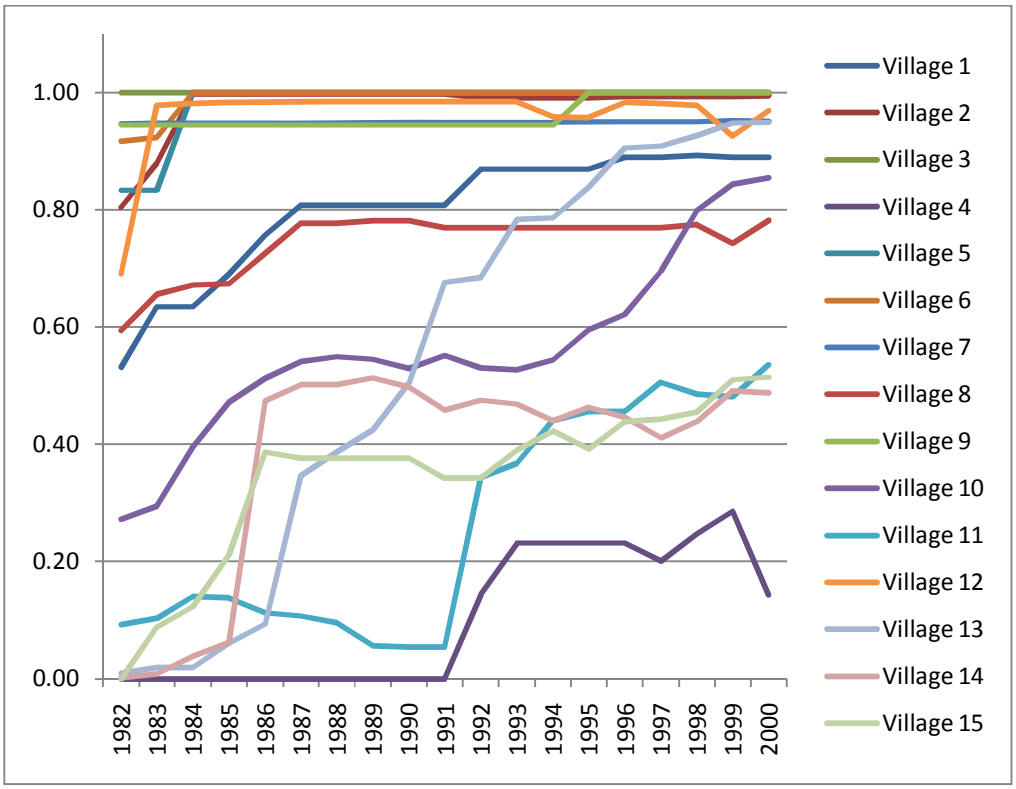


Figure 2: The mean number of co-memberships in CBOs with an economic purpose over time, village-by-village

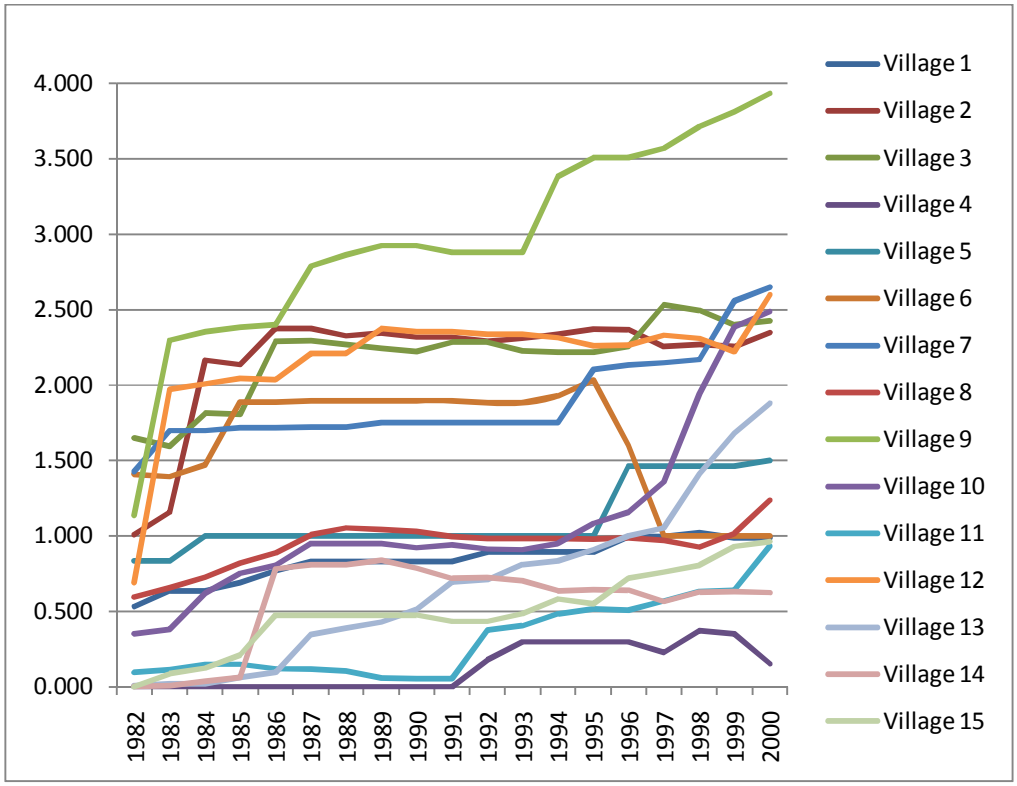
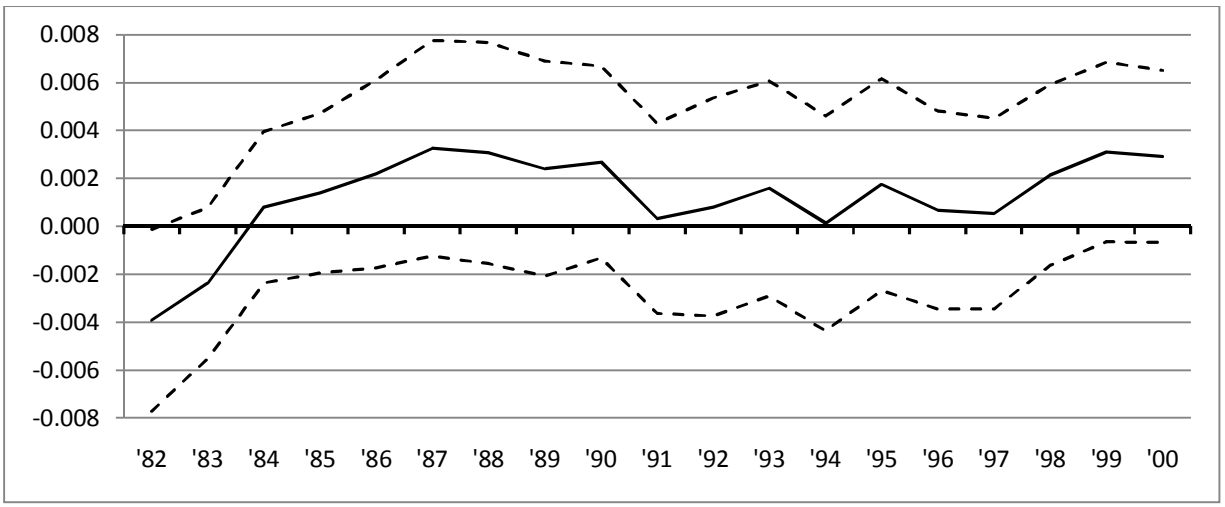


Figure 3: Effect of the dyadic difference in livestock holding on arrival on the likelihood of having at least one co-membership in a CBO with an economic purpose

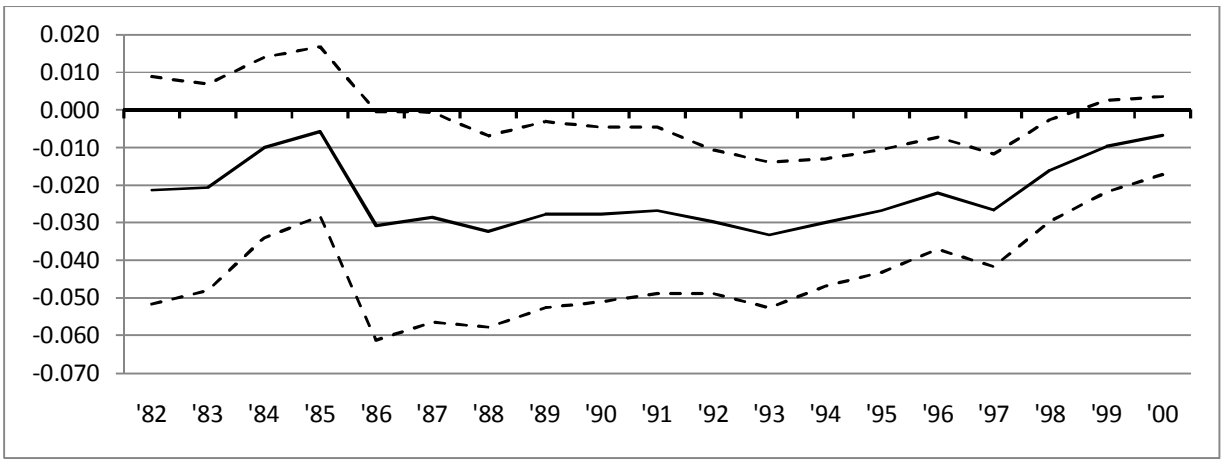


Notes: See Tables 5 and A1 for regressions.

Figure 4: Effect of the dyadic sum of livestock holding on arrival on the likelihood of having at least one co-membership in a CBO with an economic purpose

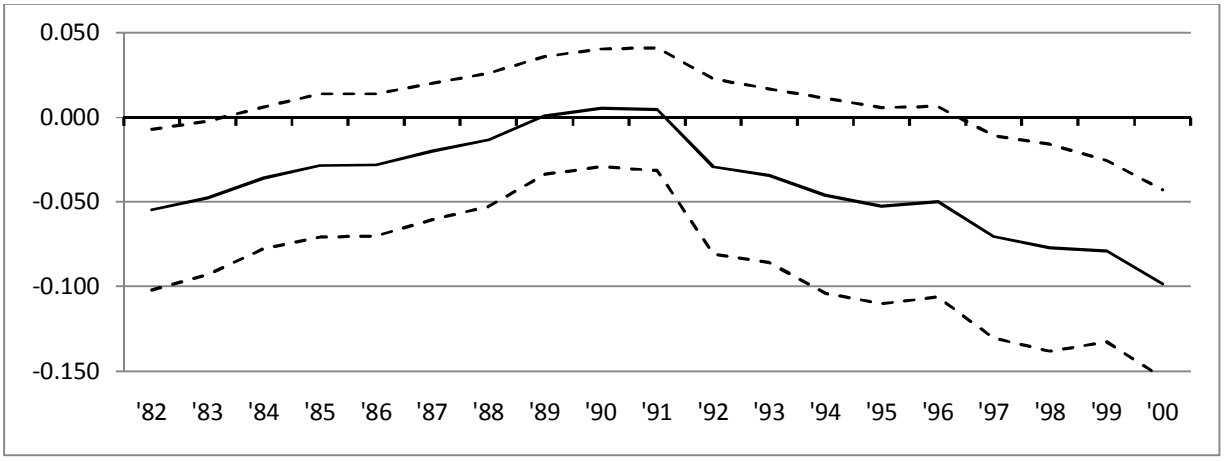
Notes: See Tables 5 and A1 for regressions.

Figure 5: Effect of the dyadic difference in number of years in village on the likelihood of having at least one co-membership in a CBO with an economic purpose



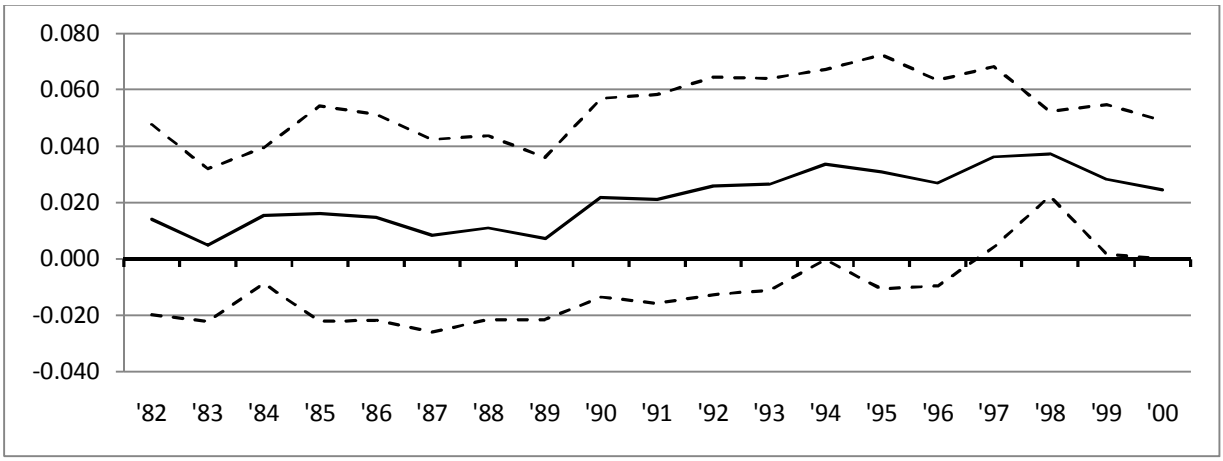
Notes: See Tables 5 and A1 for regressions.

Figure 6: Effect of the geographic distance between the households in a dyad on the likelihood of them having at least one co-membership in a CBO with an economic purpose



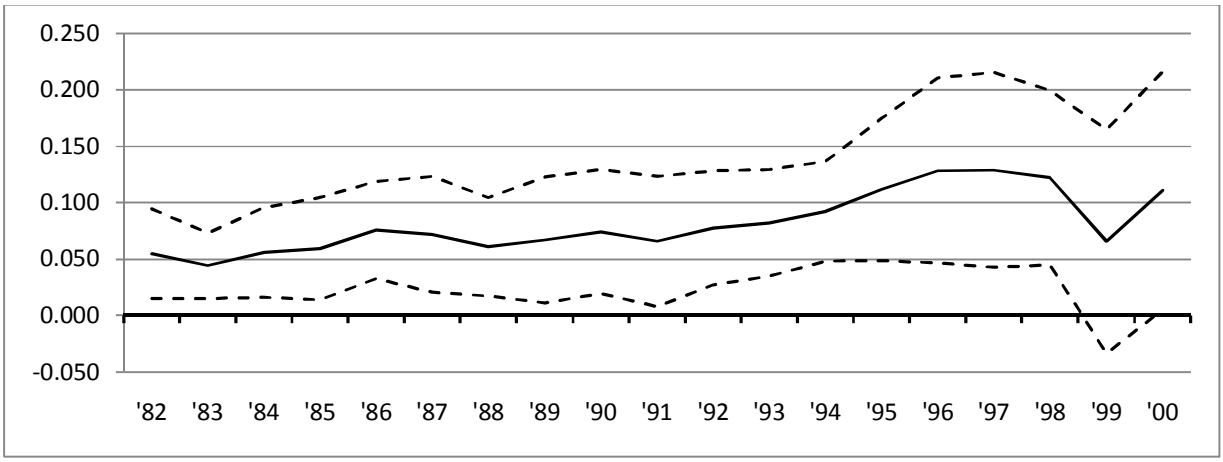
Notes: See Tables 5 and A1 for regressions.

Figure 7: Effect of difference in sex of household head on the likelihood of them having at least one co-membership in a CBO with an economic purpose



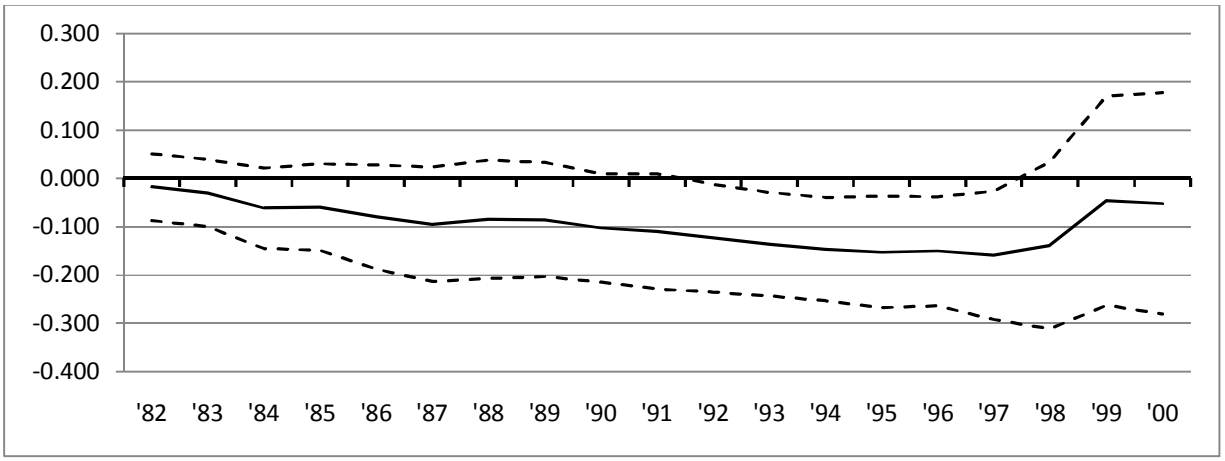
Notes: See Tables 5 and A1 for regressions.

Figure 8: Effect of difference in sex of household head on the number of co-memberships in CBOs with an economic purpose that a household dyad share



Notes: See Tables 5 and A1 for regressions.

Figure 9: Effect of both household heads being female on the number of co-memberships in CBOs with an economic purpose that a household dyad shares



Notes: See Tables 5 and A1 for regressions.

Figure 10: Village-level relationship between mean livestock wealth on arrival and the density of the economic CBO network (dichotomized) in 1982

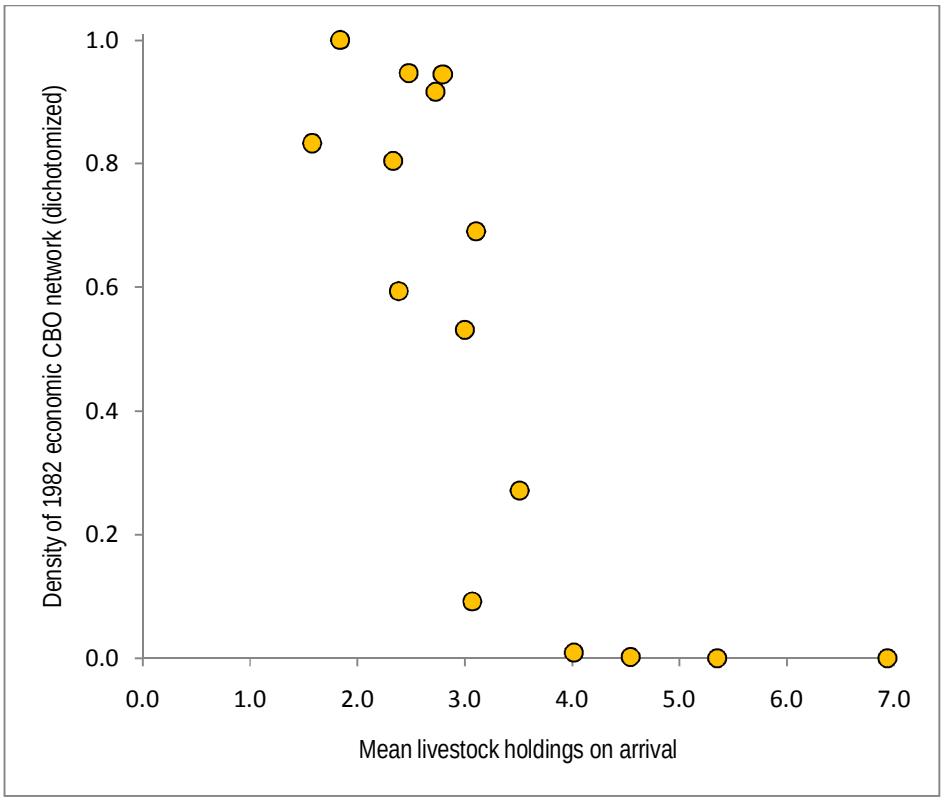


Figure 11: Village-level relationship between mean livestock wealth on arrival and the density of the economic CBO network (dichotomized) in 2000

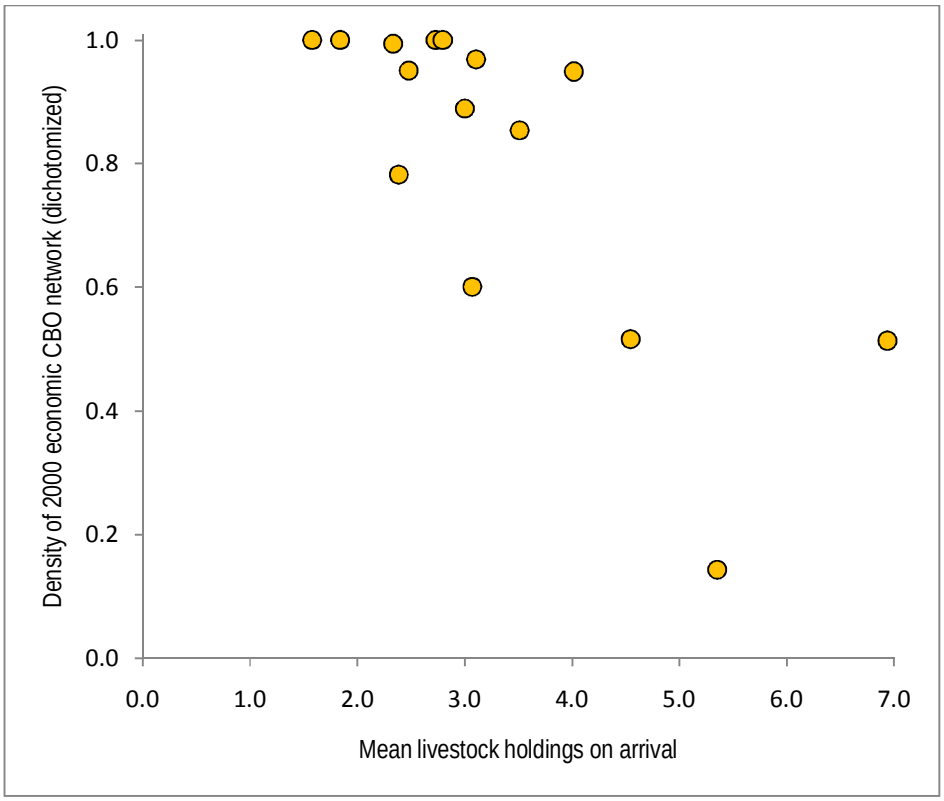


Table 1: Households resettling in and departing from the 15 villages year-by-year

Year	No. settling	No. departing	No. of households in villages	% of full sample in villages
1980	161	0	161	31.9%
1981	189	0	350	69.4%
1982	101	0	451	89.5%
1983	17	0	468	92.9%
1984	2	0	470	93.3%
1985	6	1	475	94.2%
1986	2	2	475	94.2%
1987	6	0	481	95.4%
1988	4	0	485	96.2%
1989	2	0	487	96.6%
1990	1	1	487	96.6%
1991	2	0	489	97.0%
1992	4	0	493	97.8%
1993	0	0	493	97.8%
1994	1	0	494	98.0%
1995	1	0	495	98.2%
1996	2	0	497	98.6%
1997	1	0	498	98.8%
1998	2	1	499	99.0%
1999	0	0	499	99.0%
2000	0	0	499	99.0%
Totals	504	5		

Table 2: Livestock holdings and other characteristics of resettled households

	year	n	mean or %	s.d.
Livestock holding at time of arrival		493	3.239	5.438
Female headed households	1980	159	6.3%	
	1982	444	9.7%	
	1984	463	9.9%	
Age of household head	1980	157	37.732	12.051
	1982	436	41.823	12.998
	1984	455	43.998	13.053
Size of household (headcount)	1980	159	5.654	2.531
	1982	444	6.840	3.128
	1984	464	7.517	3.414
Non-Zimbabwean		502	6.8%	
Previously lived in a curfew village		468	36.5%	

Table 3: Co-memberships in CBO's with an economic purpose (average number across dyadic sample, year-by-year)

	for dyadic population in villages year-by-year			for sample of dyads in the regression analysis year-by-year		
Year	n	% with at least one co-mem.	Av. Number of co-mems	n	% with at least one co-mem.	Av. Number of co-mems
1980	4564	43.2%	0.512			
1981	10194	53.5%	0.669			
1982	14738	53.2%	0.687	14654	55.4%	0.689
1983	15706	57.7%	0.958	15620	58.7%	0.961
1984	15818	60.8%	1.082	15730	60.8%	1.086
1985	16242	62.3%	1.132	16152	62.4%	1.136
1986	16360	66.4%	1.234	16266	66.4%	1.239
1987	16666	68.8%	1.319	16572	68.6%	1.324
1988	17032	68.5%	1.311	16936	68.6%	1.316
1989	17194	67.9%	1.324	17096	68.0%	1.330
1990	17288	68.0%	1.314	17190	67.9%	1.320
1991	17300	69.2%	1.323	17204	69.0%	1.329
1992	17614	73.5%	1.360	17516	73.2%	1.363
1993	17614	74.7%	1.371	17516	74.5%	1.374
1994	17658	75.6%	1.422	17560	75.5%	1.425
1995	17758	77.2%	1.502	17658	77.0%	1.506
1996	17900	78.5%	1.526	17800	78.4%	1.530
1997	17928	79.8%	1.553	17828	79.8%	1.556
1998	18104	81.3%	1.682	18002	82.0%	1.692
1999	18002	82.3%	1.826	18002	82.5%	1.826
2000	18002	83.7%	1.971	18002	84.0%	1.971

Table 4: Differences and sums of livestock holdings on arrival and other baseline characteristics of household dyads

Variable	n	Mean or %	s.d.
Diff. in livestock holding on arrival	17450	3.986	5.588
Sum of livestock holdings on arrival	17450	6.346	6.904
One female headed (dyadic baseline)	17388	0.181	0.385
No. female headed (dyadic baseline)	17388	0.207	0.436
Diff. in age of household head	16818	14.120	11.026
Sum of ages of houdehold heads (1982)	16818	81.992	18.705
Diff. in size of household (head count, dyadic baseline)	17388	3.407	2.863
Sum of sizes of households (dyadic baseline)	17388	12.962	4.599
One non-Zimbabwean	18160	0.101	0.302
No. non-Zimbabwean	18160	0.111	0.330
One previously lived in a curfew village	15712	0.232	0.422
No. previously lived in a curfew village	15712	0.687	0.819
Diff. in arrival time (1980=0)	18258	1.677	3.210
Sum of arrival times (1980=0)	18258	2.949	3.776
Genetic relatedness (Hamilton's ratio)	18258	0.012	0.066
Shared lineage	17764	32.0%	
Geographical distance (km)	18258	0.336	0.258
Village 1	18258	4.8%	
Village 2	18258	5.8%	
Village 3	18258	4.1%	
Village 4	18258	1.2%	
Village 5	18258	0.9%	
Village 6	18258	3.8%	
Village 7	18258	13.4%	
Village 8	18258	5.8%	
Village 9	18258	7.7%	
Village 10	18258	12.9%	
Village 11	18258	15.0%	
Village 12	18258	8.1%	
Village 13	18258	6.9%	
Village 14	18258	6.9%	
Village 15	18258	2.8%	

Table 5: The relationship between the network of economic CBO co-membership (dichotomized) and livestock holdings on arrival, with controls, selected years only

Dependent variable = 1 if dyad shares at least one co-membership in a CBO with an economic purpose, 0 otherwise

	1982	1983	1987	1991	1995	1999	2000
Diff. livestock	-0.004 *	-0.002	0.003	0.000	0.001	0.003	0.002
	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.002)
Sum livestock	0.005 *	0.001	-0.002	0.002	0.000	-0.001	-0.001
	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Diff. fem head	0.014	0.004	0.008	0.021	0.030	0.027 *	0.024
	(0.020)	(0.016)	(0.021)	(0.023)	(0.025)	(0.016)	(0.015)
Sum fem head	-0.003	-0.019	-0.029	-0.034	-0.043	-0.023	-0.018
	(0.040)	(0.041)	(0.041)	(0.046)	(0.045)	(0.039)	(0.035)
Diff. age head	0.000	0.000	0.000	-0.001	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Sum age head	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Diff. foreign	-0.044	-0.023	-0.021	-0.034	-0.016	-0.017	-0.006
	(0.034)	(0.027)	(0.033)	(0.032)	(0.031)	(0.026)	(0.023)
Sum foreign	-0.029	-0.008	-0.005	-0.009	0.005	0.007	-0.004
	(0.024)	(0.021)	(0.023)	(0.022)	(0.015)	(0.022)	(0.014)
Diff. from "keep"	-0.020	-0.017	-0.001	-0.010	0.021	0.029 **	0.029 **
	(0.027)	(0.026)	(0.026)	(0.023)	(0.018)	(0.013)	(0.012)
Sum from "keep'	0.021	0.022	0.028	0.015	0.013	0.008	0.007
	(0.029)	(0.027)	(0.025)	(0.024)	(0.023)	(0.019)	(0.018)
Diff. yrs settled	-0.022	-0.021	-0.030 *	-0.028 **	-0.028 ***	-0.010	-0.007
	(0.018)	(0.017)	(0.017)	(0.014)	(0.010)	(0.008)	(0.006)
Sum yrs settled	0.015	0.019	0.038 **	0.020	0.012	0.008	0.003
	(0.021)	(0.017)	(0.016)	(0.013)	(0.011)	(0.008)	(0.007)
Relatedness	0.026	0.074 *	0.078	0.112 **	0.014	0.007	0.017
	(0.052)	(0.045)	(0.057)	(0.055)	(0.051)	(0.056)	(0.053)
Shared lineage	-0.013	-0.017	-0.006	-0.005	-0.010	-0.007	0.001
	(0.015)	(0.013)	(0.013)	(0.014)	(0.016)	(0.015)	(0.014)
Geog. distance	-0.057 *	-0.050 *	-0.022	0.003	-0.055	-0.084 **	-0.103 ***
	(0.030)	(0.028)	(0.025)	(0.023)	(0.036)	(0.033)	(0.034)
Village f.e.s inc.	yes	yes	yes	yes	yes	yes	yes
Village f.e.s sig a	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
Observations	12032	12934	13842	14332	14656	14876	14876

Notes: Coefficients and standard errors from linear probability models reported; standard errors (in brackets) adjusted to account for interdependence across dyads sharing a common element by clustering by dyads; estimations for all years can be found in the Appendix, Table A1; * - sig. at 10%; ** - sig. at 5%.

Table 6: The relationship between economic CBO co-memberships and livestock holdings on arrival, with controls, selected years

Dependent variable = number of co-memberships in economic CBOs that dyad shares

	1982	1983	1987	1991	1995	1999	2000
Diff. livestock	-0.002	0.001	0.005	0.000	0.006	0.003	0.001
	(0.004)	(0.005)	(0.007)	(0.007)	(0.007)	(0.012)	(0.013)
Sum livestock	0.003	-0.003	-0.003	0.004	-0.004	0.002	0.006
	(0.004)	(0.005)	(0.008)	(0.008)	(0.009)	(0.013)	(0.015)
Diff. fem head	0.055 **	0.045 **	0.072 **	0.065 *	0.111 ***	0.065	0.105 *
	(0.024)	(0.017)	(0.032)	(0.035)	(0.038)	(0.059)	(0.063)
Sum fem head	-0.019	-0.030	-0.094	-0.110	-0.155 **	-0.047	-0.049
	(0.042)	(0.042)	(0.072)	(0.072)	(0.070)	(0.132)	(0.139)
Diff. age head	0.001	-0.001	-0.002	-0.002	-0.003	-0.002	-0.001
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
Sum age head	0.001	0.001	0.003	0.002	0.002	0.004	0.003
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
Diff. foreign	-0.083	-0.045	-0.107	-0.204 **	-0.150	-0.110	-0.052
	(0.051)	(0.077)	(0.109)	(0.103)	(0.097)	(0.119)	(0.126)
Sum foreign	0.035	0.061	0.093	0.161	0.111	-0.012	-0.011
	(0.074)	(0.094)	(0.125)	(0.107)	(0.093)	(0.087)	(0.091)
Diff. from "keep'	-0.009	-0.043	-0.017	-0.023	0.046	-0.013	-0.055
	(0.038)	(0.060)	(0.073)	(0.067)	(0.061)	(0.093)	(0.107)
Sum from "keep	-0.008	0.022	-0.012	-0.028	-0.090	-0.085	-0.037
	(0.048)	(0.059)	(0.075)	(0.071)	(0.083)	(0.096)	(0.106)
Diff. yrs settled	-0.039	-0.047	-0.074 **	-0.060 **	-0.047 **	-0.024	-0.023
	(0.026)	(0.030)	(0.032)	(0.026)	(0.021)	(0.022)	(0.025)
Sum yrs settled	0.047	0.049	0.060 *	0.026	0.018	0.030	0.025
	(0.032)	(0.038)	(0.032)	(0.025)	(0.021)	(0.029)	(0.032)
Relatedness	-0.002	0.148	0.171	0.171	0.276	0.251	0.189
	(0.100)	(0.168)	(0.184)	(0.173)	(0.233)	(0.285)	(0.285)
Shared lineage	-0.015	0.014	0.019	0.026	-0.004	0.032	0.073
	(0.024)	(0.036)	(0.043)	(0.042)	(0.043)	(0.056)	(0.059)
Geog. distance	-0.082	-0.109	-0.075	-0.059	-0.180	-0.132	-0.232
	(0.062)	(0.084)	(0.098)	(0.101)	(0.127)	(0.144)	(0.151)
Village f.e.s inc.	yes	yes	yes	yes	yes	yes	yes
Village f.e.s sig	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
Observations	12032	12934	13842	14332	14656	14876	14876

Notes: Coefficients and standard errors from linear regressions reported; standard errors (in brackets) adjusted to account for interdependence across dyads sharing a common element by clustering by dyads; * - sig. at 10%; ** - sig. at 5%; *** - sig. at 1%.

Table 7: Village characteristics

		mean	s.d.	minimum	maximum
Mean livestock on arrival		3.31	1.41	1.57	6.94
Density of lineage network		0.11	0.11	0.00	0.30
Proportion of households female headed		0.09	0.08	0.00	0.24
Mean household head's age 1982		42.33	3.59	37.37	49.59
Mean household head's age 1984		44.59	3.78	39.37	52.43
Mean household head's education 1982		5.31	0.98	3.43	7.26
Mean household head's education 1984		5.23	0.95	3.43	7.10
Mean household size 1982		7.03	0.95	5.38	9.21
Mean household size 1984		7.72	1.02	5.86	9.79
Proportion non-Zimbabwean		0.09	0.08	0.00	0.27
Proportion previously in curfew villages		0.40	0.33	0.00	0.85
Mean genetic relatedness		0.01	0.01	0.00	0.03
Village in southerly cluster		40%			
Number of economic CBOs in village	1982	2.13	1.64	0.00	5.00
	1983	3.13	2.47	0.00	9.00
	1987	5.27	3.97	0.00	16.00
	1991	5.40	4.31	0.00	18.00
	1995	6.27	4.38	1.00	19.00
	1999	7.47	5.10	1.00	22.00
	2000	7.67	5.16	1.00	22.00
Number of households in village	1982	30.07	10.79	12.00	49.00
	1983	31.20	10.60	12.00	50.00
	1987	32.13	10.89	13.00	50.00
	1991	32.67	11.29	13.00	50.00
	1995	33.07	11.50	13.00	51.00
	1999	33.33	11.45	13.00	51.00
	2000	33.33	11.45	13.00	51.00
Observations		15			

Table 8: Village-level pairwise correlations with density of the dichotomized economic CBO membership network

	1982	1983	1984	1985	1986	1987	1988
Mean livestock on arrival	-0.80 ***	-0.76 ***	-0.78 ***	-0.76 ***	-0.68 ***	-0.71 ***	-0.71 ***
Density of lineage network	-0.70 ***	-0.66 ***	-0.64 ***	-0.62 **	-0.53 **	-0.50 *	-0.49 *
Proportion of households female headed	-0.44	-0.43	-0.41	-0.39	-0.30	-0.20	-0.18
Mean household head's age '82/4#	-0.47 *	-0.47 *	-0.46 *	-0.46 *	-0.30	-0.30	-0.30
Mean household head's education '82/4#	-0.12	-0.08	-0.03	-0.03	-0.04	-0.05	-0.05
Mean household size '82/4#	0.22	0.18	0.08	0.07	0.04	0.05	0.06
Proportion non-Zimbabwean	0.21	0.13	0.14	0.13	0.08	0.02	0.01
Proportion previously in curfew villages	0.59	0.52	0.50	0.48	0.41	0.39	0.39
Mean genetic relatedness	0.17	0.15	0.10	0.08	0.01	0.00	0.00
Southerly cluster	-0.69 ***	-0.62 **	-0.62 **	-0.60 **	-0.53 **	-0.51 *	-0.50 *
Number of economic CBOs in village##	0.41	0.21	0.10	0.11	0.14	0.15	0.14
Number of households in village##	0.09	0.12	0.08	0.07	0.05	0.05	0.03
	1989	1990	1991	1992	1993	1994	1995
Mean livestock on arrival	-0.69 ***	-0.69 ***	-0.70 ***	-0.80 ***	-0.78 ***	-0.79 ***	-0.80 ***
Density of lineage network	-0.48 *	-0.47 *	-0.44	-0.49 *	-0.50 *	-0.49 *	-0.46 *
Proportion of households female headed	-0.16	-0.15	-0.09	-0.16	-0.16	-0.18	-0.14
Mean household head's age '82/4#	-0.28	-0.28	-0.30	-0.39	-0.39	-0.44	-0.46 *
Mean household head's education '82/4#	-0.06	-0.06	-0.05	0.00	-0.02	0.02	0.05
Mean household size '82/4#	0.08	0.09	0.10	0.07	0.11	0.07	0.06
Proportion non-Zimbabwean	0.01	-0.01	-0.04	-0.04	-0.02	-0.04	-0.07
Proportion previously in curfew villages	0.38	0.38	0.35	0.39	0.39	0.38	0.37
Mean genetic relatedness	0.01	0.01	0.02	0.02	0.04	0.00	0.01
Southerly cluster	-0.50 *	-0.49 *	-0.46 *	-0.49 *	-0.50 *	-0.49 *	-0.46 *
Number of economic CBOs in village##	0.14	0.10	0.10	-0.03	-0.14	-0.12	-0.07
Number of households in village##	0.01	0.00	0.02	0.06	0.03	0.04	0.08
	1996	1997	1998	1999	2000		
Mean livestock on arrival	-0.77 ***	-0.78 ***	-0.77 ***	-0.75 ***	-0.75 ***		
Density of lineage network	-0.42	-0.37	-0.34	-0.30	-0.21		
Proportion of households female headed	-0.11	-0.08	-0.03	-0.02	0.04		
Mean household head's age '82/4#	-0.46 *	-0.52 **	-0.51 *	-0.49 *	-0.54 **		
Mean household head's education '82/4#	0.06	0.12	0.11	0.11	0.22		
Mean household size '82/4#	0.05	-0.01	0.00	0.00	-0.13		
Proportion non-Zimbabwean	-0.10	-0.15	-0.15	-0.14	-0.25		
Proportion previously in curfew villages	0.33	0.29	0.28	0.26	0.17		
Mean genetic relatedness	0.00	-0.05	-0.04	-0.06	-0.16		
Southerly cluster	-0.42	-0.38	-0.37	-0.35	-0.25		
Number of economic CBOs in village##	-0.05	0.01	0.01	0.04	0.13		
Number of households in village##	0.09	0.14	0.15	0.16	0.24		

Notes: n=15 in every case; * - sig. at 10%; ** - sig. at 5%; *** - sig. at 1%; # 1982 mean used in correlations with density of the network in 1982 and 1983, 1884 used in correlations with density of the network in 1984 to 2000; ## the number used in each correlation relates to

Table 9: Village-level pairwise correlations with mean numbers of co-memberships in economic CBOs

	1982	1983	1984	1985	1986	1987	1988
Mean livestock on arrival	-0.72 **	-0.59 **	-0.63 **	-0.62 **	-0.57 **	-0.56 **	-0.56 **
Density of lineage network	-0.66 ***	-0.54 **	-0.54 **	-0.54 **	-0.49 *	-0.45 *	-0.45 *
Proportion of households female headed	-0.42	-0.44	-0.47 *	-0.44	-0.38	-0.33	-0.32
Mean household head's age '82/4#	-0.37	-0.47 *	-0.50 *	-0.45 *	-0.33	-0.37	-0.37
Mean household head's education '82/4#	-0.08	0.12	0.16	0.15	0.15	0.18	0.18
Mean household size '82/4#	0.27	0.09	0.01	-0.02	0.03	0.00	0.00
Proportion non-Zimbabwean	0.32	0.05	0.07	0.08	0.11	0.03	0.02
Proportion previously in curfew villages	0.54 **	0.44	0.43	0.43	0.35	0.35	0.35
Mean genetic relatedness	0.16	0.32	0.18	0.17	0.08	0.10	0.11
Southerly cluster	-0.67 **	-0.46 *	-0.49 *	-0.49 *	-0.44 *	-0.41	-0.41
Number of economic CBOs in village##	0.48	0.41	0.24	0.24	0.28	0.31	0.28
Number of households in village##	0.10	0.25	0.23	0.22	0.18	0.20	0.18
	1989	1990	1991	1992	1993	1994	1995
Mean livestock on arrival	-0.55 **	-0.55 **	-0.56 **	-0.57 **	-0.56 **	-0.52 **	-0.53 **
Density of lineage network	-0.43	-0.44	-0.43	-0.45	-0.45	-0.44	-0.43
Proportion of households female headed	-0.32	-0.32	-0.30	-0.34	-0.35	-0.37	-0.36
Mean household head's age '82/4#	-0.37	-0.37	-0.38	-0.42	-0.42	-0.46 *	-0.47 *
Mean household head's education '82/4#	0.19	0.19	0.20	0.23	0.22	0.24	0.24
Mean household size '82/4#	-0.01	-0.01	0.01	-0.01	0.00	-0.03	-0.04
Proportion non-Zimbabwean	0.00	0.00	0.00	0.01	0.01	-0.01	-0.02
Proportion previously in curfew villages	0.33	0.34	0.33	0.34	0.34	0.36	0.39
Mean genetic relatedness	0.12	0.13	0.13	0.14	0.16	0.17	0.21
Southerly cluster	-0.39	-0.39	-0.38	-0.39	-0.39	-0.38	-0.39
Number of economic CBOs in village##	0.29	0.24	0.24	0.17	0.10	0.13	0.14
Number of households in village##	0.17	0.16	0.17	0.18	0.17	0.17	0.22
	1996	1997	1998	1999	2000		
Mean livestock on arrival	-0.55 **	-0.53 **	-0.48 *	-0.44 *	-0.46 *		
Density of lineage network	-0.41	-0.33	-0.22	-0.13	-0.07		
Proportion of households female headed	-0.39	-0.34	-0.25	-0.18	-0.14		
Mean household head's age '82/4#	-0.54 **	-0.62 **	-0.64 **	-0.65 ***	-0.70 ***		
Mean household head's education '82/4#	0.23	0.31	0.35	0.37	0.47 *		
Mean household size '82/4#	-0.01	0.00	-0.03	-0.08	-0.18		
Proportion non-Zimbabwean	-0.04	-0.10	-0.15	-0.21	-0.31		
Proportion previously in curfew villages	0.38	0.30	0.23	0.21	0.13		
Mean genetic relatedness	0.20	0.16	0.16	0.18	0.12		
Southerly cluster	-0.39	-0.31	-0.23	-0.17	-0.10		
Number of economic CBOs in village##	0.10	0.19	0.27	0.36	0.41		
Number of households in village##	0.18	0.23	0.30	0.39	0.46		

Notes: n=15 in every case; * - sig. at 10%; ** - sig. at 5%; *** - sig. at 1%; # 1982 mean used in correlations with mean numbers of co-memberships in 1982 and 1983, 1884 used in correlations with mean numbers of co-memberships in 1984 to 2000; ## the number used in each correlation relates to the same year as the mean numbers of co-memberships.

Table 10: Village-level regression analyses of the density of the dichotomized economic CBO membership network

	1982	1983	1984	1985	1986	1987	1988
Mean livestock on arrival	-0.146 **	-0.151 *	-0.174 **	-0.161 *	-0.169 *	-0.177 **	-0.178 **
	(0.065)	(0.072)	(0.077)	(0.079)	(0.086)	(0.079)	(0.079)
Density of lineage network	-1.884	-3.271	-2.758	-2.376	-1.399	-0.869	-0.769
	(1.786)	(1.992)	(2.097)	(2.174)	(2.354)	(2.172)	(2.175)
Mean household head's age '82/4#	-0.015	-0.017	-0.010	-0.011	0.010	0.013	0.013
	(0.022)	(0.024)	(0.024)	(0.025)	(0.027)	(0.025)	(0.025)
Southerly cluster	0.056	0.388	0.307	0.244	0.135	0.077	0.063
	(0.393)	(0.439)	(0.462)	(0.479)	(0.518)	(0.478)	(0.479)
Constant	1.811 *	1.987 *	1.804 *	1.805	0.883	0.779	0.757
	(0.825)	(0.920)	(0.974)	(1.010)	(1.093)	(1.009)	(1.010)
R-squared	0.771	0.731	0.716	0.673	0.529	0.546	0.541
Observations	15	15	15	15	15	15	15

	1989	1990	1991	1992	1993	1994	1995
Mean livestock on arrival	-0.180 *	-0.180 *	-0.185 **	-0.170 **	-0.152 **	-0.142 **	-0.147 **
	(0.081)	(0.081)	(0.081)	(0.057)	(0.055)	(0.052)	(0.052)
Density of lineage network	-0.660	-0.640	-0.409	-1.050	-1.116	-1.054	-0.761
	(2.227)	(2.219)	(2.219)	(1.562)	(1.509)	(1.418)	(1.420)
Mean household head's age '82/4#	0.015	0.015	0.014	0.007	0.006	0.001	0.001
	(0.026)	(0.026)	(0.026)	(0.018)	(0.018)	(0.017)	(0.017)
Southerly cluster	0.042	0.045	0.028	0.173	0.179	0.169	0.129
	(0.491)	(0.489)	(0.489)	(0.344)	(0.332)	(0.312)	(0.313)
Constant	0.667	0.676	0.726	1.022	1.039	1.221 *	1.267 *
	(1.034)	(1.030)	(1.030)	(0.725)	(0.701)	(0.658)	(0.659)
R-squared	0.527	0.523	0.521	0.663	0.639	0.656	0.658
Observations	15	15	15	15	15	15	15

	1996	1997	1998	1999	2000
Mean livestock on arrival	-0.139 **	-0.140 **	-0.135 **	-0.123 **	-0.142 **
	(0.056)	(0.055)	(0.054)	(0.052)	(0.055)
Density of lineage network	-0.740	-0.525	-0.079	0.382	0.367
	(1.527)	(1.493)	(1.466)	(1.424)	(1.498)
Mean household head's age '82/4#	-0.001	-0.006	-0.005	-0.003	-0.006
	(0.018)	(0.017)	(0.017)	(0.017)	(0.017)
Southerly cluster	0.138	0.120	0.038	-0.052	0.014
	(0.336)	(0.329)	(0.323)	(0.314)	(0.330)
Constant	1.336 *	1.525 *	1.452 *	1.341 *	1.512 *
	(0.709)	(0.693)	(0.681)	(0.661)	(0.696)
R-squared	0.602	0.624	0.606	0.567	0.440
Observations	15	15	15	15	15

Notes: Coefficients and standard errors from OLS regressions (one ofr each year) presented ; # 1982 mean used in correlations with density of the network in 1982 and 1983, 1884 used in correlations with density of the network in 1984 to 2000; * - sig. at 10%; ** - sig. at 5%; *** - sig. at 1%.

Table A1: The relationship between the network of economic CBO co-membership (dichotomized) and livestock holdings on arrival, with controls

Dependent variable = 1 if dyad shares at least one co-membership in a CBO with an economic purpose, 0 otherwise

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Diff. livestock	-0.004 *	-0.002	0.001	0.001	0.002	0.003	0.003	0.002	0.002	0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)
Sum livestock	0.005 *	0.001	0.001	0.001	0.000	-0.002	-0.002	-0.001	-0.001	0.002
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Diff. fem head	0.014	0.004	0.015	0.016	0.014	0.008	0.011	0.007	0.021	0.021
	(0.020)	(0.016)	(0.014)	(0.023)	(0.022)	(0.021)	(0.020)	(0.017)	(0.021)	(0.023)
Sum fem head	-0.003	-0.019	-0.024	-0.024	-0.033	-0.029	-0.029	-0.013	-0.031	-0.034
	(0.040)	(0.041)	(0.036)	(0.035)	(0.040)	(0.041)	(0.042)	(0.043)	(0.043)	(0.046)
Diff. age head	0.000	0.000	0.000	0.000	0.000	0.000	-0.001	0.000	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Sum age head	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Diff. foreign	-0.044	-0.023	-0.034	-0.034	-0.015	-0.021	-0.027	-0.030	-0.035	-0.034
	(0.034)	(0.027)	(0.030)	(0.032)	(0.031)	(0.033)	(0.033)	(0.032)	(0.032)	(0.032)
Sum foreign	-0.029	-0.008	-0.012	-0.015	-0.005	-0.005	0.000	-0.001	0.000	-0.009
	(0.024)	(0.021)	(0.021)	(0.020)	(0.023)	(0.023)	(0.022)	(0.022)	(0.022)	(0.022)
Diff. from "keep"	-0.020	-0.017	-0.028	-0.026	-0.020	-0.001	0.014	0.008	0.007	-0.010
	(0.027)	(0.026)	(0.027)	(0.028)	(0.027)	(0.026)	(0.019)	(0.019)	(0.019)	(0.023)
Sum from "keep"	0.021	0.022	0.029	0.020	0.019	0.028	0.037	0.033	0.030	0.015
	(0.029)	(0.027)	(0.027)	(0.027)	(0.026)	(0.025)	(0.023)	(0.022)	(0.022)	(0.024)
Diff. yrs settled	-0.022	-0.021	-0.011	-0.006	-0.032 *	-0.030 *	-0.033 **	-0.029 *	-0.029 **	-0.028 **
	(0.018)	(0.017)	(0.015)	(0.014)	(0.019)	(0.017)	(0.016)	(0.015)	(0.014)	(0.014)
Sum yrs settled	0.015	0.019	0.023	0.021	0.038 **	0.038 **	0.032 **	0.024 *	0.020	0.020
	(0.021)	(0.017)	(0.015)	(0.014)	(0.017)	(0.016)	(0.016)	(0.015)	(0.014)	(0.013)
Relatedness	0.026	0.074 *	0.076 *	0.113 **	0.113 *	0.078	0.075	0.081	0.088	0.112 **
	(0.052)	(0.045)	(0.046)	(0.056)	(0.060)	(0.057)	(0.054)	(0.056)	(0.056)	(0.055)
Shared lineage	-0.013	-0.017	-0.021 *	-0.016	-0.006	-0.006	-0.005	-0.004	-0.011	-0.005
	(0.015)	(0.013)	(0.012)	(0.013)	(0.013)	(0.013)	(0.014)	(0.014)	(0.013)	(0.014)
Geog. distance	-0.057 *	-0.050 *	-0.038	-0.030	-0.030	-0.022	-0.015	0.000	0.004	0.003
	(0.030)	(0.028)	(0.026)	(0.027)	(0.027)	(0.025)	(0.025)	(0.022)	(0.022)	(0.023)
Village f.e.s inc.	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Village f.e.s sig at	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
Observations	12032	12934	13012	13398	13480	13842	14000	14150	14232	14332

Notes: Coefficients and standard errors from linear probability models reported; standard errors (in brackets) adjusted to account for interdependence across dyads sharing a common element by clustering by dyads; * - sig. at 10%; ** - sig. at 5%.

Table A1 (cont.): The relationship between the network of economic CBO co-membership (dichotomized) and livestock holdings on arrival, with controls

Dependent variable = 1 if dyad shares at least one co-membership in a CBO with an economic purpose, 0 otherwise

	1992	1993	1994	1995	1996	1997	1998	1999	2000
Diff. livestock	0.001	0.001	0.000	0.001	0.000	0.000	0.002	0.003	0.002
	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Sum livestock	0.002	0.000	0.001	0.000	0.001	0.001	-0.001	-0.001	-0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Diff. fem head	0.025	0.026	0.033	0.030	0.026	0.036 *	0.036 ***	0.027 *	0.024
	(0.023)	(0.023)	(0.020)	(0.025)	(0.022)	(0.020)	(0.009)	(0.016)	(0.015)
Sum fem head	-0.037	-0.048	-0.059	-0.043	-0.041	-0.042	-0.044	-0.023	-0.018
	(0.046)	(0.045)	(0.044)	(0.045)	(0.041)	(0.041)	(0.038)	(0.039)	(0.035)
Diff. age head	-0.001	-0.001	-0.001	0.000	0.000	0.000	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Sum age head	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Diff. foreign	-0.024	-0.036	-0.039	-0.016	-0.012	-0.005	-0.001	-0.017	-0.006
	(0.037)	(0.032)	(0.037)	(0.031)	(0.030)	(0.024)	(0.021)	(0.026)	(0.023)
Sum foreign	-0.003	0.005	-0.007	0.005	0.004	0.003	-0.008	0.007	-0.004
	(0.023)	(0.022)	(0.022)	(0.015)	(0.015)	(0.015)	(0.014)	(0.022)	(0.014)
Diff. from "keep"	0.007	0.008	0.006	0.021	0.027	0.027	0.017	0.029 **	0.029 **
	(0.025)	(0.025)	(0.023)	(0.018)	(0.017)	(0.017)	(0.018)	(0.013)	(0.012)
Sum from "keep"	0.030	0.026	0.025	0.013	0.014	0.014	0.007	0.008	0.007
	(0.026)	(0.025)	(0.025)	(0.023)	(0.022)	(0.022)	(0.022)	(0.019)	(0.018)
Diff. yrs settled	-0.031 ***	-0.034 ***	-0.031 ***	-0.028 ***	-0.023 **	-0.027 ***	-0.016 **	-0.010	-0.007
	(0.012)	(0.012)	(0.010)	(0.010)	(0.009)	(0.009)	(0.008)	(0.008)	(0.006)
Sum yrs settled	0.016	0.018	0.011	0.012	0.010	0.015	0.008	0.008	0.003
	(0.012)	(0.012)	(0.011)	(0.011)	(0.010)	(0.010)	(0.009)	(0.008)	(0.007)
Relatedness	0.069	0.041	0.016	0.014	0.005	0.015	0.030	0.007	0.017
	(0.055)	(0.053)	(0.056)	(0.051)	(0.053)	(0.054)	(0.045)	(0.056)	(0.053)
Shared lineage	-0.009	-0.012	-0.012	-0.010	-0.011	-0.005	-0.008	-0.007	0.001
	(0.016)	(0.015)	(0.016)	(0.016)	(0.015)	(0.015)	(0.013)	(0.015)	(0.014)
Geog. distance	-0.031	-0.036	-0.049	-0.055	-0.052	-0.074 **	-0.081 **	-0.084 **	-0.103 ***
	(0.032)	(0.032)	(0.036)	(0.036)	(0.035)	(0.037)	(0.038)	(0.033)	(0.034)
Village f.e.s inc.	yes	yes	yes	yes	yes	yes	yes	yes	yes
Village f.e.s sig at	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
Observations	14616	14616	14656	14656	14784	14812	14876	14876	14876

Notes: Coefficients and standard errors from linear probability models reported; standard errors (in brackets) adjusted to account for interdependence across dyads sharing a common element by clustering by dyads; * - sig. at 10%; ** - sig. at 5%; *** - sig. at 1%.

Table A2: The relationship between economic CBO co-memberships and livestock holdings on arrival, with controls

Dependent variable = 1 if dyad shares at least one co-membership in a CBO with an economic purpose, 0 otherwise

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Diff. livestock	-0.002	0.001	0.004	0.004	0.006	0.005	0.004	0.002	0.003	0.000
	(0.004)	(0.005)	(0.005)	(0.005)	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Sum livestock	0.003	-0.003	-0.003	-0.002	-0.003	-0.003	-0.002	0.001	0.001	0.004
	(0.004)	(0.005)	(0.006)	(0.006)	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Diff. fem head	0.055 **	0.045 **	0.056 **	0.059 **	0.076 ***	0.072 **	0.061 **	0.067 *	0.074 **	0.065 *
	(0.024)	(0.017)	(0.024)	(0.028)	(0.027)	(0.032)	(0.027)	(0.034)	(0.034)	(0.035)
Sum fem head	-0.019	-0.030	-0.061	-0.060	-0.079	-0.094	-0.084	-0.085	-0.103	-0.110
	(0.042)	(0.042)	(0.049)	(0.054)	(0.065)	(0.072)	(0.074)	(0.071)	(0.068)	(0.072)
Diff. age head	0.001	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002	-0.001	-0.002	-0.002
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Sum age head	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.002	0.002	0.002
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Diff. foreign	-0.083	-0.045	-0.165 **	-0.175 **	-0.097	-0.107	-0.137	-0.148	-0.165	-0.204 **
	(0.051)	(0.077)	(0.083)	(0.086)	(0.093)	(0.109)	(0.110)	(0.109)	(0.108)	(0.103)
Sum foreign	0.035	0.061	0.140	0.154	0.105	0.093	0.084	0.102	0.106	0.161
	(0.074)	(0.094)	(0.103)	(0.101)	(0.121)	(0.125)	(0.125)	(0.119)	(0.118)	(0.107)
Diff. from "keep"	-0.009	-0.043	-0.057	-0.044	-0.037	-0.017	-0.006	-0.015	-0.015	-0.023
	(0.038)	(0.060)	(0.064)	(0.065)	(0.065)	(0.073)	(0.068)	(0.068)	(0.068)	(0.067)
Sum from "keep"	-0.008	0.022	0.028	0.010	0.008	-0.012	-0.001	-0.007	-0.020	-0.028
	(0.048)	(0.059)	(0.064)	(0.067)	(0.072)	(0.075)	(0.073)	(0.072)	(0.071)	(0.071)
Diff. yrs settled	-0.039	-0.047	-0.046	-0.035	-0.074 **	-0.074 **	-0.084 ***	-0.078 ***	-0.072 ***	-0.060 **
	(0.026)	(0.030)	(0.030)	(0.028)	(0.035)	(0.032)	(0.030)	(0.029)	(0.027)	(0.026)
Sum yrs settled	0.047	0.049	0.047	0.042	0.071 *	0.060 *	0.052 *	0.041	0.032	0.026
	(0.032)	(0.038)	(0.037)	(0.031)	(0.036)	(0.032)	(0.031)	(0.029)	(0.028)	(0.025)
Relatedness	-0.002	0.148	0.098	0.228	0.199	0.171	0.184	0.130	0.129	0.171
	(0.100)	(0.168)	(0.170)	(0.172)	(0.179)	(0.184)	(0.173)	(0.172)	(0.172)	(0.173)
Shared lineage	-0.015	0.014	0.011	0.000	0.018	0.019	0.020	0.027	0.015	0.026
	(0.024)	(0.036)	(0.038)	(0.039)	(0.041)	(0.043)	(0.043)	(0.043)	(0.042)	(0.042)
Geog. distance	-0.082	-0.109	-0.130	-0.145	-0.101	-0.075	-0.061	-0.079	-0.072	-0.059
	(0.062)	(0.084)	(0.090)	(0.091)	(0.095)	(0.098)	(0.097)	(0.102)	(0.102)	(0.101)
Village f.e.s inc.	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Village f.e.s sig at	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
Observations	12032	12934	13012	13398	13480	13842	14000	14150	14232	14332

Notes: Coefficients and standard errors from linear regressions reported; standard errors (in brackets) adjusted to account for interdependence across dyads sharing a common element by clustering by dyads; * - sig. at 10%; ** - sig. at 5%; *** - sig. at 1%.

Table A2 (cont.): The relationship between economic CBO co-memberships and livestock holdings on arrival, with controls

Dependent variable = 1 if dyad shares at least one co-membership in a CBO with an economic purpose, 0 otherwise

	1992	1993	1994	1995	1996	1997	1998	1999	2000
Diff. livestock	0.000	0.002	0.002	0.006	0.006	0.008	0.011	0.003	0.001
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.009)	(0.012)	(0.013)
Sum livestock	0.005	0.002	0.000	-0.004	-0.004	-0.007	-0.007	0.002	0.006
	(0.008)	(0.008)	(0.008)	(0.009)	(0.008)	(0.009)	(0.011)	(0.013)	(0.015)
Diff. fem head	0.077 **	0.082 ***	0.092 ***	0.111 ***	0.127 **	0.128 **	0.121 ***	0.065	0.105 *
	(0.031)	(0.029)	(0.027)	(0.038)	(0.050)	(0.053)	(0.047)	(0.059)	(0.063)
Sum fem head	-0.123 *	-0.137 **	-0.148 **	-0.155 **	-0.154 **	-0.161 **	-0.140	-0.047	-0.049
	(0.068)	(0.065)	(0.065)	(0.070)	(0.069)	(0.081)	(0.105)	(0.132)	(0.139)
Diff. age head	-0.002	-0.002	-0.003	-0.003	-0.003	-0.003	-0.003	-0.002	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
Sum age head	0.003	0.003	0.003	0.002	0.003	0.002	0.004	0.004	0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
Diff. foreign	-0.185 *	-0.196 *	-0.204 *	-0.150	-0.094	-0.080	-0.107	-0.110	-0.052
	(0.105)	(0.104)	(0.121)	(0.097)	(0.100)	(0.092)	(0.105)	(0.119)	(0.126)
Sum foreign	0.162	0.149	0.116	0.111	0.094	0.069	0.040	-0.012	-0.011
	(0.100)	(0.098)	(0.104)	(0.093)	(0.084)	(0.088)	(0.096)	(0.087)	(0.091)
Diff. from "keep"	-0.002	0.001	-0.005	0.046	0.039	0.031	0.001	-0.013	-0.055
	(0.070)	(0.070)	(0.079)	(0.061)	(0.060)	(0.060)	(0.076)	(0.093)	(0.107)
Sum from "keep"	-0.006	-0.016	-0.018	-0.090	-0.065	-0.045	-0.090	-0.085	-0.037
	(0.072)	(0.073)	(0.077)	(0.083)	(0.078)	(0.077)	(0.085)	(0.096)	(0.106)
Diff. yrs settled	-0.055 **	-0.059 ***	-0.056 ***	-0.047 **	-0.040 **	-0.047 **	-0.028	-0.024	-0.023
	(0.022)	(0.022)	(0.020)	(0.021)	(0.019)	(0.019)	(0.023)	(0.022)	(0.025)
Sum yrs settled	0.018	0.020	0.013	0.018	0.009	0.019	0.018	0.030	0.025
	(0.022)	(0.022)	(0.020)	(0.021)	(0.019)	(0.019)	(0.021)	(0.029)	(0.032)
Relatedness	0.136	0.096	0.144	0.276	0.258	0.269	0.308	0.251	0.189
	(0.172)	(0.173)	(0.180)	(0.233)	(0.236)	(0.236)	(0.240)	(0.285)	(0.285)
Shared lineage	0.015	0.003	-0.008	-0.004	-0.022	-0.010	0.015	0.032	0.073
	(0.042)	(0.042)	(0.042)	(0.043)	(0.041)	(0.044)	(0.050)	(0.056)	(0.059)
Geog. distance	-0.102	-0.094	-0.122	-0.180	-0.146	-0.182	-0.181	-0.132	-0.232
	(0.106)	(0.106)	(0.109)	(0.127)	(0.124)	(0.125)	(0.138)	(0.144)	(0.151)
Village f.e.s inc.	yes	yes	yes	yes	yes	yes	yes	yes	yes
Village f.e.s sig at	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
Observations	14616	14616	14656	14656	14784	14812	14876	14876	14876

Notes: Coefficients and standard errors from linear regressions reported; standard errors (in brackets) adjusted to account for interdependence across dyads sharing a common element by clustering by dyads; * - sig. at 10%; ** - sig. at 5%; *** - sig. at 1%.