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Collective action and vulnerability: Burial societies in rural Ethiopia

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1. Introduction

Collective action has both intrinsic and instrumental value. Being part of a group and participating towards meeting a common objective provides direct benefits to individuals. In the Ethiopian survey data used in this study, individuals who report having larger networks also report higher levels of happiness. Such correlations are not unique to Ethiopia. Using data from the World Values Survey, Helliwell and Putnam (2004) found that individuals who report higher levels of individual and collective civic engagement also reported higher scores on measures of subjective well-being. Collective action is also a means to an end. For example, the joint management of irrigation canals, rangelands, and fisheries are actions by groups that allow individuals to generate higher and more sustainable incomes. The focus of this paper is a specific, instrumental dimension of collective action: the role of groups and networks in helping households in poor communities manage their exposure to risks and cope with shocks to their livelihoods.

In doing so, the paper builds on research addressing how poor households respond to shocks; see, Morduch (2005) and references therein, the review paper by Skoufias and Quisumbing (2005), and the recent collection edited by Dercon (2005). These show that households can partially smooth consumption in the face of shocks, but not perfectly; as might be expected, idiosyncratic shocks (low or late rainfall on household plots) are more likely to be insured collectively than are generalized shocks (low rainfall on most plots in the village). In most empirical studies of risk-smoothing, e.g., Townsend (1994), the insurance unit is often assumed to be the village. Most of these studies show that households are generally able to cope with idiosyncratic shocks, but not covariate shocks—implying that local insurance mechanisms are inadequate to cope with aggregate shocks. More recent studies (e.g., Munshi and Rosenzweig 2005) have begun to question the assumption that the appropriate unit of risk-smoothing is the village. They suggest that consumption is smoothed within subcaste networks, which extend beyond the village. Indeed, the literature on migration and remittances suggests that networks can cross geographic boundaries, with the formation of migrant networks in the destination being affected by shocks in the origin locality (Munshi 2003).

There is also a subset of studies that attempts to isolate the role of gift-giving and informal loans for households to cope with shocks; results indicate that households are

not perfectly "altruistic"; the problems of asymmetric information and limited commitment mean that households are not likely to be fully insured (Ligon, Thomas, and Worral 2000; Foster and Rosenzweig 2000).[1] However, such analyses do not assess whether responses differ depending on the nature of the shock, and indicators for collective action and participation in different types of networks are generally are either absent or rudimentary. There are some exceptions. Fafchamps and Lund (2003) differentiate among different types of risk, and specifically address how different networks are used. They show that risk-sharing appears to occur mostly in very small networks of close friends and families—networks that may not have the heterogeneity required to efficiently share risk. In Ethiopia, Dercon and Krishnan (2000) specifically address potential gender differences in terms of risk-coping, and find that poor women, particularly in one region, are less able to smooth consumption in the face of risks.

The collective action literature shows that the density of networks in general, and participation in more formal groups in particular, can lead to either more effective participation in community-based activities (White and Runge 1994; Isham and Kahkonen 2002), or higher household incomes (Pender and Scherr 2002; Haddad and Maluccio 2003; Narayan and Pritchett 1999). However, there is a lack of consensus on the impact of heterogeneity on collective action. In most empirical studies where researchers use various measures of heterogeneity to examine the impact on collective action or on household incomes directly, the impact of any type of heterogeneity tends to be negative, or not significant (Ahuja 1998; Alesina and La Ferrara 2000; Bardhan 2000; McCarthy and Vanderlinden 2003; Place et al. forthcoming), with the interesting exception of results reported in Grootaert (2001). It is often hypothesized that heterogeneity of any sort makes finding agreements mutually beneficial and acceptable to all more costly, and that sociocultural heterogeneity in particular is likely to reduce trust among group members and also reduce the efficacy of social sanctioning (Easterly and Levine 1997). On the other hand, much of the literature on group formation and networks highlights the added benefits to diversity (or heterogeneity) among members along any number of dimensions. Risk-pooling will certainly be more efficient when

[1] However, Genicot and Ray (2003) show that with imperfect enforceability of contracts, stable insurance groups can exist above or below village-level.

one's income is less correlated with other members in the groups, which implies that having members with different agricultural activities and occupational structure is better for the insurance mechanism. Many networks exist to share information; clearly if everyone has the same background, and the same current sociocultural and economic profile, there is little need to rely on networks to share information. Finally, there may be economies of scope in terms of information gathering—or accumulation of other assets, for that matter. In this case, economic heterogeneity also favors pooling of resources to the benefit of all. Because there may be competing impacts of different types of heterogeneity on the functioning of groups, it becomes critical to examine which groups are able to harness the positive, and mitigate the negative effects, of heterogeneity.

Finally, if groups differ in terms of degree of heterogeneity and geographic dispersion, what kinds of enforcement mechanisms are used to ensure compliance to network objectives and norms of behavior? Members of local networks are easier to monitor, but local networks are less able to insure against covariate shocks. Spatially diversified networks offer some protection against covariate shocks, but network members will be more difficult to monitor. If information and communications technologies are poor, more distant network members may not even be aware of a shock that occurred in their origin communities.

Interest in these issues is more than just academic curiosity. Understanding these networks is as crucial to understanding the determinants of poverty and the policies to move people out of poverty as understanding land tenure or access to financial capital. A misunderstanding of the roles of these networks can lead to policy changes that have unintended consequences on the functioning of these networks, with potentially damaging effects on the capacity of the poor to mitigate, and cope with, the effects of shocks. At the same time, a better understanding of such networks can lead to the identification of policies that complement existing networks that already serve the poor well, and to policies that can substitute for networks that simply are not reaching the poor.

In the material that follows, we address these issues by drawing on rich longitudinal household and qualitative community data from Ethiopia. After describing these data in some detail, we examine the shocks these households face and their impact

on living standards. We then look at the correlates of participation in groups and networks—both formal and informal—and the relationship of networks with access to other forms of capital. In the final substantive section, we pull these together to assess how one form of collective action, *iddir*, allow households to attenuate the impact of illness.

2. Data and context

Ethiopia is a federal country divided into 11 regions. Each region is sub-divided into zones and the zones into woredas which are roughly equivalent to a county in the US or UK. Woredas, in turn, are divided into Peasant Associations (PA), or kebeles, an administrative unit consisting of a number of villages. Peasant Associations were set up in the aftermath of the 1974 revolution. Our data are taken from the Ethiopia Rural Household Survey (ERHS), a unique longitudinal household data set covering households in 15 areas of rural Ethiopia. Data collection started in 1989, when a survey team visited 6 Peasant Associations in Central and Southern Ethiopia. The survey was expanded in 1994 to encompass 15 Peasant Associations across the country, yielding a sample of 1477 households. As part of the survey re-design and extension that took place in 1994, the sample was re-randomized by including an exact proportion of newly formed or arrived households in the sample, as well as by replacing households lost to follow-up by others considered broadly similar to them in demographic and wealth terms by village elders and officials. The nine additional PAs were selected to better account for the diversity in the farming systems found in Ethiopia. The sampling in the PAs newly included in 1994 was based on a list of all households that was constructed with the help of the local Peasant Association officials.[2] The sample was stratified within each village to ensure that a representative number of landless households were also included. Similarly, an exact proportion of female headed households were included via stratification. Consequently, as Dercon, Hoddinott, and Woldehanna (2005) show, population shares within the sample are broadly consistent with the population shares in

[2] The PA was responsible for the implementation of land reform following 1974 and held wide ranging powers as a local authority. All land is owned by the government. To obtain land, households have to register with the PA and, thus, lists are maintained of the households who have been allocated land. These household lists were a good source of information for the construction of a sampling frame.

the three main sedentary farming systems—the plough-based cereals farming systems of the Northern and Central Highlands, mixed plough/hoe cereals farming systems, and farming systems based around *enset* (a root crop also called false banana), which is grown in southern parts of the country. Note too that in 1994, the Central Statistical Office collected a data set as part of the Welfare Monitoring System. Many of the average outcome variables, in terms of health and nutrition, were very similar to the results in the ERHS, suggesting that living conditions in our sample did not differ greatly from those found more generally throughout rural Ethiopia (see Collier, Dercon, and Mackinnon 1997). For these reasons, the sampling frame to select the villages can be seen as one that was stratified by agroecological zones and subzones, with one to three villages selected per strata. Further, sample sizes in each village were chosen so as to approximate a self-weighting sample, when considered in terms of farming system: each person (approximately) represents the same number of persons found in the main farming systems as of 1994. However, we use this feature of the sample cautiously. It does not include pastoral households or urban areas. Also, the practical aspects associated with running a longitudinal household survey, when the sampled localities are as much as 1,000 kilometers apart in a country where top speeds on the best roads rarely exceed 50 kilometers per hour, constrained sampling to only 15 communities in a country of thousands of villages. So while these data can be considered broadly representative of households in nonpastoralist farming systems as of 1994, extrapolation from these results should be done with care.

Additional survey rounds were subsequently in late 1994, 1995, 1997, 1999, and 2004. These surveys were conducted, either individually or collectively, by the Economics Department at Addis Ababa University, the Centre for the Study of African Economies, the University of Oxford, or the International Food Policy Research Institute. Sample attrition between 1994 and 2004 is low, with a loss of only 12.4 percent (or 1.3 percent per year) of the sample over this 10-year period, in part because of this institutional continuity. This continuity also helped ensure that questions asked in each round were identical, or very similar, to those asked in previous rounds and that the data

were processed in comparable ways.[3] In addition, detailed qualitative studies were undertaken in the mid-1990s, the results of which are reported in Bevan and Pankhurst (1996).[4] Smaller scale qualitative studies have been carried out in selected survey sites on specific topics, including some on collective action; see Section 5.

Table 1 provides descriptive statistics based on the 2004 survey round. Two features are immediately apparent. First, these households are very poor. Mean monthly consumption per capita was 106 birr or about $13 per person and about 36 percent are below the poverty line. Second, agriculture is the dominant source of income for these households, accounting for two-thirds of household income.

3. Shocks in rural Ethiopia

We define shocks as adverse events that lead to a loss of household income, a reduction in consumption, a loss of productive assets, and/or serious concern/anxiety about household welfare. Data used in this section are based on a household-level "shocks" module developed in Hoddinott and Quisumbing (2003). The module asks households to consider a list of adverse events and indicate whether the household was adversely affected by them. Ethiopian respondents were asked, "Has this household been affected by a serious shock—an event that led to a serious reduction in your asset holdings, caused your household income to fall substantially, or resulted in a significant reduction in consumption?"

Shocks are divided into a number of broad categories: climatic; economic; political/social/legal; crime; and health. Climatic shocks include obvious examples such as drought and flooding, but also erosion, frosts, and pestilence affecting crops or livestock. Economic shocks include problems in terms of access to inputs (both physical access and large increases in price), decreases in output prices, and difficulties in selling

[3] We examined whether this sample attrition is nonrandom. Over the period 1994-2004, there are no significant differences between attriters and non-attriters in terms of initial levels of characteristics of the head (age, sex), assets (fertile land, all landholdings, cattle), or consumption. However, attriting households were, at baseline, smaller than non-attriting households. Between 1999 and 2004, there are some significant differences by village with one village, Shumsha, having a higher attrition rate than others in the sample. Our survey supervisors recorded the reason why a household could not be traced. Using these data, we examined attrition in Shumsha on a case-by-case basis, but could not find any dominant reason why households attrited.

[4] These are in the process of being updated, based on new fieldwork carried out in 2004 and 2005.

agricultural and nonagricultural products. Political/social/legal shocks include the confiscation of assets or arbitrary taxation by government authorities, social or political discrimination or exclusion and contract disputes. Crime shocks include the theft and/or destruction of crops, livestock, housing, tools or household durables as well as crimes against persons. Health shocks include both death and illness. We also consider miscellaneous shocks such as conflicts and disputes with other family members, neighbors, or other village residents regarding access to land or other assets. Finally, in addition to these questions about specific shocks, households were also asked to enumerate the three most important adverse shocks that they had experienced over the previous five years.

As Table 2 shows, virtually all households in the Ethiopian sample (95 percent) reported a most important shock, 85 percent reported a second most important shock, and 62 percent reported a third most important shock. The most commonly reported "worst shocks" are drought (47 percent), death (43 percent), and illness (28 percent). When we disaggregate by degree of importance of these worst shocks (not reported here), we see that these same three shocks were always listed as being the most important adverse shocks experienced by these households. Input and output shocks, pests affecting crops, and crime are all reported by between 11 and 14 percent of households. Other shocks are less frequently reported. Strikingly, policy shocks (land redistribution, state confiscation of assets, resettlement, villagization or forced migration, bans on migration, forced contributions, or arbitrary taxation), which featured so prominently in earlier rounds of the ERHS, have substantially diminished in importance. Only 7 percent of households reported being adversely affected by such policy shocks compared to 42 percent who reported being affected by these prior to 1994 (Dercon 2002, Table 1).

While these data provide a detailed overview of the types of shocks experienced by households, it does not give us a quantitative sense of their consequences. Also, there are limits to cross-sectional analysis—it is difficult to tell, for example, if, conditional on location, wealth, and other observable characteristics, female-headed households in Ethiopia are more adversely affected by droughts than male-headed households. For these reasons, we summarize the results of Dercon, Hoddinott and Woldehanna (2005) who

report an econometric assessment of the impact of these shocks on one measure of welfare, log per capita consumption.[5]

Log per capita consumption (*lnpcexp*) of household *i* in village *v* in time *t* is a function of two broad sets of household characteristics: household characteristics observed in the past (time *t*-1) ($H_{iv,\,t-1}$) and shocks to households experienced between time *t*-1 and time *t* ($S_{iv,\,t}$).[6] Vectors of parameters to be estimated are γ, β, and κ. In Ethiopia, log per capita consumption is measured in 2004, while past household characteristics from 1999 are used as regressors. Denoting $\varepsilon_{iv,\,t}$ as the white noise disturbance term, we write this relationship as

$$lnpcexp_{iv,\,t} = \gamma \cdot H_{iv,\,t-1} + \beta \cdot S_{iv,\,t} + \kappa \cdot X_{iv,\,t} + \varepsilon_{iv,\,t}\,. \qquad (1)$$

Observable household characteristics are characteristics of the head (age, sex, and schooling), demographic household characteristics (log size and dependency ratio), and household wealth: landholdings and livestock ownership, the latter expressed in livestock units. Also included are measures of households' networks and connections within the village that may also affect consumption levels: whether the household belongs to an ethnic or religious minority; whether it is related to anyone holding an official position in the locality; and whether a parent of the household head was an important person in the social life of the village. As some shocks are relatively more common than others, we aggregate the data we have on shocks into several categories, whether the household had experienced the following events that had led to a loss of household income, a reduction in consumption, and/or a loss of productive assets: a drought; too much rain, pests or diseases that affected field crops or crops in storage; pests or diseases that affected

[5] Consumption is the sum of food and nonfood consumption. For each food item, households were asked about the amounts they had consumed out of purchases, consumption out of own stock, and consumption from gifts and wages in-kind in the last week. In general, these consumption levels are valued using prices obtained from local market surveys fielded at the same time as the household survey. Nonfood items are limited to non-investment goods so that we include consumables such as matches, batteries, soap, kerosene and the like, clothing, and transport but exclude investments in durable goods such as housing. Different recall periods were used for different items; for comparability all are changed into monthly (30-day) consumption and expressed in per capita terms. Dercon and Krishnan (2003) show that earlier survey rounds, using various permutations of adult equivalency, does not fundamentally affect the analysis of the determinants of living standards.

[6] We also include a vector that captures such potentially confounding factors such as the month in which the interview took place to capture seasonality.

livestock; difficulty in obtaining inputs or increases in input prices; inability to sell or decreases in output prices; lack of demand for nonagricultural products; theft or destruction of tools, inputs, cash, crops, livestock, housing or consumer goods, death of head, spouse or another person; and illness of head, spouse, or another person. Finally, dummy variables are included for each village in Ethiopia. The implication is that shocks are identified by within-village (municipality) variation, which may make identification of covariate shocks difficult. However, even though covariate shocks are found in virtually all villages, even in the case of drought, there is no village where all households indicate having been affected in the last five years in Ethiopia. This allows us to identify of the impact of these relatively covariate events in our data.

Basic results from Dercon, Hoddinott and Woldehanna (2005) are reported in Table 3. The striking feature of the results of the shocks variables is how *unimportant* many of them seem to be. Experiencing a drought at least once in the previous five years lowers per capita consumption by approximately 20 percent and experiencing an illness that reduces per capita consumption by approximately 9 percent are the only shock variables that have a statistically significant effect on consumption. Other past shocks, controlling for a wide range of household characteristics, have no statistically significant impact on current (2004) levels of consumption. Table 3, however, examines only the average effects of these shocks across all households in the sample. In Table 4 we extend this earlier work by disaggregating along three dimensions of pre-shock (1999) household characteristics—sex of head, landholdings, and location—and explore the extent to which the impact of shocks differs across different household types. When we do so, some interesting differences do emerge: drought shocks have a more severe effect on female-headed households and on poorer households as measured by landholdings; and illness shocks matter much more in survey areas south of Addis Ababa, where malaria is much more common. We return to this latter below.

4. Networks, Groups, and Collective Action

Having described the broader environments that our respondents live in and the effects of shocks on them, our next step is to consider the role of collective action in mitigating these.

In the 2004 survey round, households were asked to provide details ". . . about the five most important people you can rely on in time of need for support, both within the village and elsewhere." In addition, they were asked whether there were other people, beyond these five, who could be relied on for help in time of need. We call such individuals a "network" and in this section we provide descriptive statistics on three dimensions of these networks: correlations between network size and observable household characteristics; characteristics of individuals within a household's network; and the degree of network heterogeneity.

Virtually all households—91 percent—report that there is at least one person they can rely on for assistance. Figure 1 plots a density function for the size of networks reported by these households. The median number of people in a households' network is 5 with about a quarter of households reporting that they have two or fewer people in their network and a smaller percentage (16 percent) reporting 10 or more people in their network. Further, there is some evidence that households do indeed call on these networks. Respondents indicate that they received help from 86 percent of the individuals they list as part of their network. There is also some evidence of reciprocity in these relationships: in 75 percent of the individuals listed as being in a household's network, households had both received *and* provided assistance in the past. In fewer than 10 percent of individuals listed as part of a network had assistance neither been given nor received.

Table 5 provides descriptive statistics on some of the characteristics of individuals found in these networks. Most individuals in these networks are neighbors (60 percent) or, while not neighbors, live in the same village (27 percent). However, just over a quarter have at least one plot of land adjacent to a plot held by the household. Only 13 percent of individuals in households' network reside outside the village. The most common relationship is either being a relative or being a member of the same *iddir* (burial societies or funeral associations); indeed, only 12 percent of network members are neither relatives nor members of the same *iddir*. Network members are often (49 percent) individuals whom previously the household had borrowed from or lent to. They are unlikely to be individuals with whom the household sharecrops, hires in, or hires out labor or buys or sells crops.

Are other network members similar or dissimilar to our respondents? We consider two dimensions: comparative measures of wealth and age. If we stratify the sample by landownership, we find that poorer households have relatively better-off households in their network while richer households tend to have relatively poorer households in their network. However, when we compare oxen ownership, a different pattern emerges. Households with no oxen or only one animal tend to have as network partners similar households. Households with two or more oxen typically have as network partners other households with two or more oxen. Figure 2 graphs the distribution of the difference in age between the household head and other individuals in the network who are either relatives or members of the same *iddir*. The modal age difference for both is close to zero. However, while the distribution for age differences among *iddir* members is more peaked than for relatives, both are characterized by a considerable spread around this mode.

Table 6 examines the associations between household characteristics and the likelihood that a household has a network as well as the size of that network. The first column reports the results of estimating a probit where the dependent variable equals one if the household has at least one person in its network, zero otherwise. To make the coefficients readily interpretable, we report the marginal effects of the regressors in column (1). In columns (2) and (3), we report the determinants of the size of the household's network. Because our estimates need to take account of the fact that the dependent variable is censored at zero, we use a tobit estimator and this is reported in column (2).[7]

There are few household characteristics that are associated with an increased or decreased *likelihood* that a household has at least one person in its network. The only statistically significant characteristics are whether the household's landholdings lie within the fourth (second highest) quintile within the village and whether the father of the household head belonged to an *iddir* that marginally increases (by 4.7 percent) the likelihood that the household has at least one person in its network. However, being

[7] Because estimates derived from a tobit are suspect if the underlying disturbance terms are non-normally distributed, we also report the results of estimating Powell's (1984) censored least absolute deviations model. We report t-statistics based on bootstrapped standard errors; following Davidson and Mackinnon (2000), these are based on 1,000 replications.

wealthier, as defined in terms of landholdings, is associated with having a larger network. Households in the fourth and top land quintiles have 1 to 2 more people in their network compared to the households in the bottom quintile of landholdings. Family background also plays some role in influencing network size. Having a parent who was an important person in social life of the village, having a relative who holds an official position within the village, and having a father who belonged to an *iddir*, all increase the mean number of persons in a household's network. Lastly, households belonging to ethnic or religious minorities are not disadvantaged when it comes to network size.[8]

5. *Iddir* and their role in mitigating shocks

In this section, we consider the role of one form of collective action—*iddir* (burial societies or funeral associations) and their role in mitigating shocks in Ethiopia. Members of *iddir* typically meet once or twice a month, making a small payment into a group fund (1-2 birr per month). A striking feature of these organizations is their degree of formality; often there are written rules and records of contributions and payouts (Dercon et al. 2006).[9] When a member dies, the *iddir* makes a payment to surviving family members in cash or in kind. The median amount that is paid out by the *iddir* that our households belong to is 100 birr, although there is some heterogeneity in these payments.

Outside of Tigray, *iddir* membership is widespread, with nearly 90 percent of households reporting that they belong to at least one *iddir*. Among households who report belonging to *iddir* (and again excluding Tigray, where *iddir* do not exist), just under 60 percent report belonging to one *iddir*, 21 percent belong to two, and another 20 percent belong to three or more. Very few households, around 4 percent of the sample, claim that they do not belong to an *iddir* because they cannot afford the monthly dues.

[8] We note that De Weerdt (2005) obtains similar results in Tanzania, finding that kinship and wealth are also strong determinants of network formation. Fafchamps and Lund (2003) also find that in the Philippines, pre-existing personal relationships, rather than risk-pooling, dominate reasons for network formation.

[9] Also see the descriptions found in Dejene (1993, 1998) and Pankhurst (2003). Note that these characteristics are consistent with a number of the factors identified by Ostrom *et al* (1994) as necessary for successful collective action, including the ability to collectively modify rules, the existence of sanctions and conflict resolution mechanisms and a functioning management system.

Virtually all *iddir* (93 percent) are situated within the PA. Two-thirds of *iddir* appear to have no restrictions on membership beyond paying the necessary dues and fees, 14 percent were restricted to members of the same church or mosque, 6 percent were restricted to women, and 14 percent had some other restriction. All villages had at least one *iddir* that was open to anyone.[10]

Why are *iddir* of interest? In addition providing what is in effect a form of life insurance, a third of the *iddir* these households belong to provide cash payouts to their members when they have experienced other types of adverse shocks and a quarter offer loans. As Table 7 shows, the most common form of assistance apart from funerals is cash payouts in cases of fires. In addition, 10 percent of *iddir* provide cash in case of illness and 15 percent provide loans. However, the provision of some types of assistance is not found everywhere—for example, assistance in the case of illness is concentrated in four survey sites, all south of Addis Ababa. Noting this, we juxtapose the following observations: (1) after drought, households report that the two next most important types of shocks are illness and death (Table 2); (2) illness shocks have an especially large effect on consumption in villages located south of Addis Ababa (Table 4); (3) membership in *iddir* are widespread and other *iddir* members are seen as being individuals who can be called on in times of need (Table 5); and (4) in selected localities, some *iddir* provide assistance when illness shocks occur (Table 7).

Two questions arise: (1) does this provision of assistance when illness shocks occur—in effect a form of health insurance—reduce their impact on consumption; and (2) if the answer to question (1) is affirmative, how do these *iddir* overcome problems of moral hazard and adverse selection that typically bedevil insurance schemes.

Answering question (1) is tricky because households can choose which *iddir* they wish to belong to. Because membership in *iddir* is endogenous, we cannot, for example, insert membership in *iddir* providing health insurance into (1) to see how it modifies the impact of self-reported illness shocks—coefficients from such a regression will be biased

[10] In preliminary work, we examined the correlates of *iddir* membership. Wealthier households are more likely to join *iddir*, and to join more *iddir*, the magnitude of these effects is not large. Larger households and households where the father of the head had been an *iddir* member are more likely to join *iddir*. However, being a female-headed household or belonging to an ethnic or religious minority had no statistically significant impact on the likelihood or extent of *iddir* membership. Full results are available on request.

and inconsistent. Instead, we take a different approach. We start by restricting the sample to villages south of Addis Ababa, where, in general, illness shocks have the largest effect on consumption. We separate these southern villages into two groups: those where *iddir* that provide health insurance are present; and those where they are not present. Within these groups of villages, we estimate equation (1) using a modification of the specification reported in Table 3.[11] Finally, we restrict the sample to households in the lowest three landholding quintiles to see if the availability of such insurance is *particularly* important for poorer households.

Results are reported in Table 8. These show that illness shocks reported by poor households residing in villages where no *iddir* provide health insurance are associated with a large—20 percent—reduction in per capita consumption. By contrast, the impact of illness shocks on poor households in villages where *iddir* do provide health insurance is smaller and not statistically significant.[12] These results are suggestive that the availability of this health insurance attenuates illness shocks.

However, our household data have only limited information on how *iddir* manage the provision of health insurance. For this reason, we organized a small survey of *iddir* in four villages where the ERHS data indicated that *iddir* provided this form of assistance.[13] The challenge in doing so was finding these *iddir*. There is no "official" list of *iddir*, let alone lists that describe which *iddir* provide which type of assistance. *Iddir* do not exist in a physical sense—for example, there is no *iddir* office. The names of *iddir* can be lengthy and are often shortened in different ways by different people. Leadership of *iddir* is, in many cases, on an elected basis, and so the names of *iddir* leaders change over time. Given all this, we organized the survey in the following fashion. Using the ERHS data, we generated a list of *iddir* in the four villages where *iddir* were known to provide health insurance. Enumerators were given a list of the names of 12 *iddir* that provided either cash grants or loans in the case of illness, along with identifying information such as

[11] Specifically, in order to conserve degrees of freedom, we drop a number of variables that do not have explanatory power: age and sex of household head and four shocks: input prices, output prices, floods, and crime. If these are included, the coefficients reported in Table 8 do not change but the standard errors increase.

[12] This result also holds true if the standard errors are constructed so as to account for clustering at the village level.

[13] The villages were Sirbana Godeti, Korodegaga, Tirufe Ketchma and Garagodo.

alternate names, dates these *iddir* were formed, approximate number of members, and names of leaders such as the *iddir* chair. Enumerators were instructed to find at least eight of these. Once found, they asked if a small number of members would be willing to participate in a discussion about how this form of health insurance worked. The meetings included the *iddir* chair and, in nearly all cases, at least two other individuals knowledgeable about the functioning of the *iddir*, including the treasurer. Across all four villages, a semi-structured questionnaire was administered to 33 *iddir*. Some questions were pre-coded (for example, are members charged interest if they take a loan to cover health expenses?) while others were designed to encourage *iddir* members to explain how they functioned (for example, how do members go about requesting assistance).

The successful provision of insurance revolves around the resolution of two forms of asymmetric information, adverse selection and moral hazard. In the context of health insurance, adverse selection arises because individuals who are less healthy than others have a greater incentive to seek insurance but the healthiness of such individuals is difficult to observe by the insurer. Moral hazard occurs where, once insured, an individual does not bear the full consequences of actions which are (at least partially) unobserved by the insurer.

How do *iddir* deal with these problems of asymmetric information? One obvious way would be to impose restrictions on who can join and when they join. The household survey asked *iddir* participants if their *iddir* restricted membership in any way. In the four villages where health insurance is offered, most (81 percent) *iddir* described by respondents imposed some sort of membership restriction. As Table 9 shows, the most common restriction was geographic—all members had to live in the same Peasant Association (PA). Other common restrictions include belonging to the same church or mosque or being women-only. Membership restrictions based on clan, ethnicity, or youth were not common and beyond these broad categories, no other restrictions were mentioned. *Iddir* that imposed certain types of membership restrictions—based on residing in the same PA or church/mosque—were more likely to provide health insurance than those that did not (see Table 9), even after taking into account other *iddir* characteristics, such as age, number of members and location (see Table 10). In the *iddir* survey, a number of respondents commented that this restriction exists largely because it

was impractical for members to attend monthly meetings if they live too far away, a point we return to below. By contrast, there does not appear to be restrictions on when individuals can join these *iddir*. In almost all cases, new members could join at any time and only two required that new members belonged for a minimum length of time before they are eligible for assistance with health shocks. However, individuals who join after the *iddir* is formed must pay a membership fee (Dercon et al. 2006).

All 33 surveyed *iddir* stated that members who wanted to request assistance should do so before they incurred any expenditures; only two would consider requests from members after expenditures are incurred. Further, assistance is almost always limited to direct medical expenses: only one *iddir* would provide funds to pay for hiring workers to assist with agricultural tasks; only one *iddir* would pay for hiring someone to assist with domestic tasks; and none would compensate for loss of income as a result of illness.

The feature uniting these shared characteristics is the way in which they address the problem of asymmetric information. Restricting membership geographically makes it easier to learn about members and to monitor their behavior. The same is true about the requirement for common church or mosque membership.[14] Direct medical costs are observable. For example, one *iddir* reported that "His neighbors serve as an informant. For example, if the member takes the money for medication and if he does not go to clinic/hospital, he will be asked to return the money." Other means of checking include going to the home of the member and asking to see receipts. In fact, about a third of the *iddir* surveyed stated that they had formal checks in place to make sure these funds were spent on medical related costs. Second, a considerable number of *iddir* conducted background checks prior to approving a grant or loan—visiting the member at home or asking neighbors to confirm that assistance was needed. By contrast, compensation for income loss is much more problematic because it is difficult to determine how much of the income loss was directly ascribable to illness. The one component that these mechanisms do not address is that of adverse selection; here in the guise that individuals who might anticipate having to incur medical expenses in the future would join with the

[14] Another advantage of church or mosque membership is that observance of certain religious principles—such as prohibitions on smoking and drinking; the encouragement of monogamous relationships—discourages adverse selection problems (sinners need not apply) while reducing moral hazard.

express purpose of accessing funds held by the *iddir*. While *iddir* do not prevent this directly—recall that new members can join at any time and very few restrict new members' access to health insurance—the imposition of a membership fee for new members discourages such behavior.

In addition to these mechanisms for dealing with informational asymmetries, these *iddir* take a number of steps to reduce the likelihood that the provision of health insurance will lead to financial difficulties for the *iddir*. One is their age structure. As Figure 2 showed, there is considerable dispersion in the distribution of ages of *iddir* members. As a result, there is—in effect—health insurance across generations as young members contribute to the *iddir* while older members are more likely to have age-related illnesses. Another observation consistent with this argument is that youth-only *iddir* are less likely, related to other *iddir*, to provide health insurance. A second mechanism is size. Preliminary work with the ERHS data suggested a non-linear relationship between the likelihood of providing assistance with *iddir* in the second, third or fourth quartiles, as ranked by size, being slightly less likely to provide health insurance, see Table 10. Third, what is especially interesting is that the amount of money provided to members, either in the form of cash or loans, is tied fairly tightly to the amount of money *iddir* collect each month. Figure 3 shows that the 33 surveyed *iddir* are fairly conservative in this regard. The median *iddir* providing cash grants provides an amount equal to one month's income and the maximum cash grant of the *iddir* at the 75th percentile is slightly more than two month's income. Loans as a ratio of monthly income tend to be higher than cash grants. However, while few (4/33) *iddir* charge interest on these loans, about 75 percent require repayment within three months. In addition, most (82 percent) impose sanctions if members do not repay: either taking the individuals to local court or prohibiting them from making monthly contributions. The latter is especially effective because members who fail to not make monthly contributions risk forfeiting their claim to their past contributions.

To summarize, health shocks have serious consequences for consumption levels of rural Ethiopian households. In some localities, a form of collective action—*iddir* or burial societies—provide a form of health insurance and in these villages, illness shocks appear to have smaller effects on consumption. These *iddir* have managed to address

problems of asymmetric information by imposing membership restrictions that reduce the cost of obtaining information; restricting assistance to an observable component of illness shocks; and by using membership fees to discourage adverse selection. Further, they use a number of mechanisms to ensure financial sustainability: age structure; grant and loan size relative to income; and a series of mechanisms to ensure timely repayment of loans.

6. Conclusions and Policy Implications

Using longitudinal data and qualitative survey work, we have attempted to understand the role of groups and networks in determining how the poor manage their exposure to risks and cope with shocks to their livelihoods. In these Ethiopian villages, drought and illness have especially malign effects; for example, illness shocks reduce per capita consumption by 9 percent in regions where malaria is endemic. Nearly all households in the ERHS report that they have a network of individuals whom they can call on for help. These networks consist largely of other households in the same village. This suggests that the scope for addressing covariate risks is likely to be limited; a supposition borne out by the observation, made in Section 3 that drought shocks lead to reductions in household consumption levels. Individuals within these networks would appear to engage in reciprocal assistance. Further, they typically have other ties; in particular, they are relatives, members of the same *iddir,* or members of the same labor-sharing group. Better-off households tend to have larger networks as do households whose relations (parents or other relatives) had either status or connections within the village. Network heterogeneity is mixed: network members tend to be varied when measured by age or landownership but not in terms of ownership of oxen. *Iddir* providing health insurance are homogeneous along some dimensions (geography, and to a certain extent, religion) but heterogeneous with respect to age. They impose membership restrictions that reduce the cost of obtaining information and restrict assistance to an observable component of illness shocks (medical expenditures) that can be verified; further, they limit the extent of their assistance so that the provision of assistance does not come at the cost of financial sustainability.

These results point to the following policy implications:

- Realism is needed in assessing the pro-poor benefits of support to collective action. Because wealthier and better-educated households tend to participate more in groups and to have larger networks implies that development practitioners need to pay more attention to identifying those barriers that prevent the poor—or other segments of the population—from participating in collective action. Not only because they have lower levels of wealth, but also because they participate less in risk-smoothing networks, the poor are more likely to be vulnerable to both covariate and idiosyncratic shocks.
- Realism is also needed in terms of the role of collective action in responding to shocks. Specifically, where households have limited ability to develop spatial networks, collective action has limited ability to respond to covariate (common) shocks. Direct public action is more appropriate in this area.
- Collective action may be more suitable for providing an insurance function in response to idiosyncratic (individual) shocks. Public action and policy that supports forms of collective action in this area must recognize, as exemplified by the *iddirs* study here, that successful collective action:
    - is based on norms of trust and reciprocity. As trust is easier to destroy than create, the principal of "do no harm" is important here, particularly when government actions are aimed toward existing collective action institutions;
    - has mechanisms for overcoming information problems; and
    - has mechanisms for sanctioning individuals who break the rules.
- *Iddir* providing health insurance exist in only some of the villages where illness shocks are prevalent and costly. Supporting the dissemination of examples of "good practice" across space – helping create "associations of associations" for example, would be valuable.

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Tables

Table 1: Descriptive characteristics of the Ethiopian sample, 2004

Characteristic	
Demographic	
Mean household size	5.7 people
Percent households that are female-headed	30.3%
Percent of household heads with *any* education	23.1%
Living standards	
Monthly consumption per capita, Mean	106.2 birr
Monthly consumption per capita, Median	75.1 birr
Percent households below poverty line	36%
Income sources, percentages	
Crop income	67%
Wage income	5%
Self-employment	19%
Transfers	8%

Notes: Ethiopian Rural Household Survey, 2004. For details on construction of consumption and income aggregates and poverty line, see Dercon, Hoddinott, and Woldehanna 2007. Monetary figures as in 2004 birr. At the time of the survey, the birr-US dollar exchange rate was approximately 8 birr to the dollar. Self-employment includes incomes from processing agricultural products (livestock, beer) and nonagricultural activities such as trading or selling firewood and charcoal. Transfers include both public and private transfers.

Table 2: Household self-reports of the worst shocks experienced between 1999 and 2004, Ethiopia

Worst shocks	Percent
Most commonly reported	
Drought	46.8
Death of head, spouse or another person	42.7
Illness of head, spouse or another person	28.1
Inability to sell outputs or decreases in output prices	14.5
Pests or diseases that affected crops	13.8
Crime	12.7
Difficulty in obtaining inputs or increases in input prices	11.3
Policy/political shocks (land redistribution, state confiscation of assets, resettlement, villagization, or forced migration, bans on migration, forced contributions, or arbitrary taxation)	7.4
Pests or diseases that affected livestock	7.0
Most commonly reported, by degree of importance	
Most important shock	
Drought	32.6
Death of head, spouse, or another person	26.1
Illness of head, spouse, or another person	8.0
Second most important shock	
Death of head, spouse, or another person	14.8
Drought	13.6
Illness of head, spouse, or another person	12.3
Third most important shock	
Illness of head, spouse, or another person	12.2
Death of head, spouse, or another person	8.1
Drought	8.0

Notes: Data are taken from the Ethiopian Rural Household Survey, Round 6; 1,371 households provided reported information; in response to the question, "what were the three most important shocks to affect this household," 95 percent of households reported a most important shock, 85 percent reported a second most important shock, and 62 percent reported a third most important shock.

Table 3: Impact of shocks and other covariates on (log) consumption per capita, 2004, Ethiopia

Covariate	Estimated coefficient	(1) t statistic (absolute value)	(2) t statistic (absolute value)
Shocks in prior five years			
Drought	-0.182	3.03*	2.49
Floods	0.025	0.59	0.28
Pests or diseases that affected field crops or crops in storage	-0.001	0.05	0.01
Pests or diseases that affected livestock	0.003	0.05	0.05
Difficulty in obtaining inputs or increases in input prices	0.058	1.00	1.11
Inability to sell outputs or decreases in output prices	-0.076	1.16	1.06
Lack of demand for nonagricultural products	-0.108	0.93	0.83
Theft or destruction of tools, inputs, cash, crops, livestock, housing, or consumer goods (crime)	0.051	0.96	0.71
Death of head, spouse, or another person	0.025	0.59	0.63
Illness of head, spouse, or another person	-0.096	1.91*	1.68
Other controls			
Female-headed, 1999	-0.024	0.45	0.39
Log age head, 1999	0.092	1.25	1.30
Head has schooling, 1999	0.082	1.39	2.19**
Log household size, 1999	-0.284	6.36**	8.43**
Dependency ratio, 1999	-0.033	1.92*	2.39**
Household in second land quintile, 1999	0.062	0.98	1.10
Household in third land quintile, 1999	0.140	2.29**	1.63
Household in fourth land quintile, 1999	0.143	2.27**	2.21**
Household in top land quintile, 1999	-0.036	0.49	0.42
Livestock units, 1999	0.035	4.05**	3.64**
Member, ethnic minority	0.192	2.89**	2.94**
Member, religious minority	0.064	1.11	0.79
Relative holds official position in PA	0.124	2.99**	3.39**
Mother or father was important in social life of village	0.170	3.93**	3.18**
R^2	0.31		
Sample size	1,281		

Notes: Standard errors are calculated using Huber-White method; * Significant at the 10 percent level; ** significant at the 5 percent level; PA dummies are also included but not reported.

Table 4: Impact of shocks, by household characteristic on (log) consumption per capita, 2004, Ethiopia

	Male-headed households	Female-headed households	Household is in bottom three land quintiles	Household is in top two land quintiles	Village is located north of Addis Ababa	Village is located south of Addis Ababa
Drought	-0.086 (1.21)	-0.433 (3.77)**	-0.189 (2.50)**	-0.152 (1.55)	-0.238 (3.63)**	-0.295 (3.07)**
Floods	0.061 (0.89)	-0.097 (0.77)	-0.002 (0.03)	0.092 (0.95)	-0.094 (0.88)	0.086 (1.17)
Pests or diseases that affected crops	-0.001 (0.02)	0.011 (0.10)	0.003 (0.04)	0.011 (0.12)	0.027 (0.29)	-0.037 (0.58)
Pests or diseases that affected livestock	0.035 (0.56)	-0.037 (0.22)	-0.067 (0.85)	0.048 (0.53)	0.003 (0.03)	-0.021 (0.30)
Difficulty in obtaining inputs or increases in input prices	0.084 (1.37)	-0.050 (0.32)	0.041 (0.56)	0.114 (1.20)	-0.062 (0.53)	0.099 (1.34)
Inability to sell outputs or decreases in output prices	-0.063 (0.93)	0.068 (0.36)	0.042 (0.56)	-0.164 (1.56)	0.122 (0.58)	-0.098 (1.47)
Lack of demand for nonagricultural products	-0.111 (0.91)	-0.270 (0.97)	-0.072 (0.50)	-0.358 (1.75)*	0.026 (0.11)	-0.317 (2.09)**
Crime shocks	0.010 (0.17)	0.204 (1.68)	0.010 (0.15)	0.118 (1.28)	-0.057 (0.61)	0.094 (1.46)
Death of head, spouse or another person	0.057 (1.20)	-0.178 (1.92)*	0.027 (0.50)	0.049 (0.70)	0.107 (1.70)*	-0.027 (0.46)
Illness of head, spouse or another person	-0.076 (1.43)	-0.146 (0.96)	-0.058 (0.89)	-0.168 (2.05)**	-0.003 (0.04)	-0.143 (2.17)**

Notes: Specification as per Table 3; standard errors are calculated using Huber-White method; * Significant at the 10 percent level; ** significant at the 5 percent level.

Table 5: Characteristics of individuals in a household's network, Ethiopia

Percentage of individuals who are	Percent
Neighbors	60
Not neighbors, but in same village	27
Not neighbors, live outside village	13
Have plot(s) of land next to plots belonging to this household	28
Members of the same *mehabir* (social group)	21
Relative	66
Belong to same *iddir* (burial society)	57
Neither relative nor member of same *iddir*	12
Members of the same labor-sharing group	43
Partners in sharecropping or land renting arrangement	6
Partners in oxen sharing arrangement	23
Members of the same *iqqub*	7
Borrow or lend money	49
Do wage work	7
Buy or sell crops	4

Table 6: Correlates of the presence of networks and their size, Ethiopia

	(1)	(2)	(3)
	Probit (Dependent variable: Household has at least one person in network)	**Tobit (Dependent variable: Number of people in household's network)**	**Censored least absolute deviations (Dependent variable: Number of people in household's network)**
Household is in second landowning quintile†	0.032	0.039	0.607
	(2.28)**	(0.04)	(1.21)
Household is in third landowning quintile†	0.040	0.527	0.685
	(3.15)**	(0.60)	(1.32)
Household is in fourth landowning quintile†	0.050	1.904	1.856
	(3.67)**	(2.18)**	(3.97)**
Household is in highest landowning quintile†	0.031	3.037	1.726
	(2.18)**	(3.07)**	(2.52)**
Log of age of head	-0.039	0.357	-0.114
	(1.81)*	(0.34)	(0.17)
Female-headed household†	-0.004	-0.938	-0.212
	(0.28)	(1.29)	(0.51)
Head has schooling†	0.024	2.081	0.951
	(1.55)	(2.57)**	(1.78)*
Log household size	-0.008	1.302	0.443
	(0.64)	(2.15)**	(1.27)
Household head born in this village†	-0.003	-1.164	-0.682
	(0.20)	(1.59)	(1.57)
Mother or father was important person in social life of village†	-0.007	0.814	0.977
	(0.60)	(1.24)	(2.52)**
Relative holds official position	0.020	1.378	1.111
	(1.62)	(2.22)**	(2.72)**
Father belonged to an *iddir*†	0.048	2.395	0.878
	(3.25)**	(3.38)**	(2.13)**
Household belongs to an ethnic minority in PA†	-0.018	-0.582	0.309
	(0.73)	(0.60)	(0.52)
Household belongs to religious minority in PA†	0.002	0.988	0.100
	(0.11)	(1.22)	(0.20)

Notes:
1. Results of probit are presented in terms of the marginal effects of the regressors; dummy variables measure marginal impact of switching from zero to one.
2. Covariates marked with a † are dummy variables.
3. In column (1), absolute value of Z statistics are in parentheses; in columns (2) and (3), absolute values of t statistics are in parentheses. Standard errors in column (1) are heteroscedastic-robust. Standard errors calculated in column (3) use a bootstrap with 1,000 replications.
4. * Significant at the 10 percent level; ** significant at the 5 percent level.
5. PA dummies are included but not reported. Sample size is 1,124.

Table 7: Events for which *iddir* make payouts or offer loans

Event	*Iddir* will give a cash transfer	*Iddir* will give a loan
	(percent)	(percent)
Funeral	100	9
Fire	20	9
Loss of oxen or other livestock	7	3
Destruction of house	6	4
Wedding	5	5
Illness	10	15
Harvest loss	3	2
Other event	6	1
Any event	34	25

Table 8: Impact of illness shocks on (log) consumption per capita in southern Ethiopia

	Estimated coefficient	t statistic (absolute value)
Impact of illness of head, spouse or another person on households in bottom three land quintiles		
Households residing in villages where *iddir* provide health insurance	-0.144	1.03
Households residing in villages where *iddir* do not provide health insurance	-0.205	2.08**

Notes: Specification is a modified version of that reported in Table 3; standard errors are calculated using Huber-White method; * significant at the 10 percent level; ** significant at the 5 percent level.

Table 9: Characteristics of *iddir*, by provision of health insurance

		Percentage of *iddir* that		
Membership restriction	Percentage of *iddir* with this restriction	Do not provide health insurance	Provide health insurance	Prob value on difference
Must reside in PA	41.0%	23.5%	38.1%	0.04**
Must belong to the same clan	4.0	28.3	57.1	0.10*
Must belong to the same church or mosque	24.9	26.2	39.5	0.10*
Must belong to the same ethnic group	4.0	28.5	50.0	0.19
Youth only	4.0	30.0	14.3	0.37
Women only	23.7	30.3	26.8	0.67

Notes: * significant at the 10 percent level; ** significant at the 5 percent level.

Table 10: Correlates of the provision of health insurance in selected survey areas

Covariate	Marginal effect	z statistic (absolute value)
Membership restriction		
Must reside in PA†	0.197	2.15**
Must belong to the same clan†	0.174	0.81
Must belong to the same church or mosque†	0.210	2.12**
Women only†	0.060	0.62
Log age of *iddir*	-0.074	1.58
Iddir in 2nd, 3rd of 4th quartile for size†	0.139	1.79*

Notes: Results of probit are presented in terms of the marginal effects of the regressors; dummy variables measure marginal impact of switching from zero to one. Covariates marked with a † are dummy variables. Standard errors are calculated using Huber-White method; * significant at the 10 percent level; ** significant at the 5 percent level; PA dummies are included but not reported. Sample size is 169.

Figures

Figure 1: Network size, Ethiopia

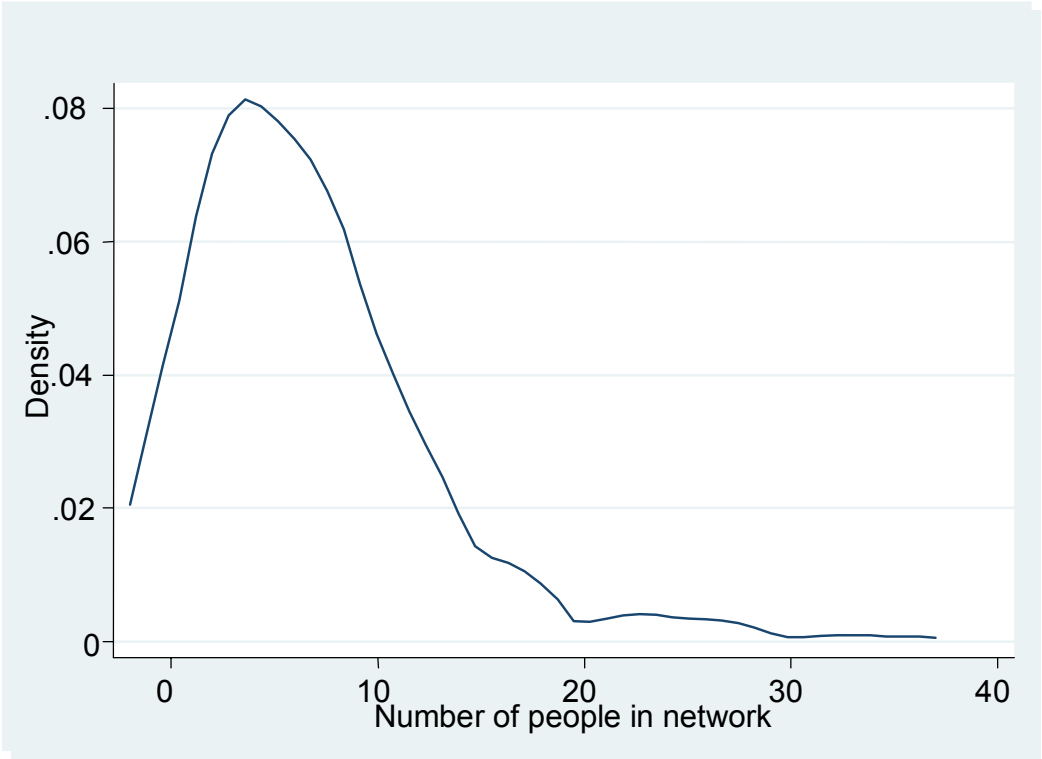

Figure 2: Age differences with networks, Ethiopia

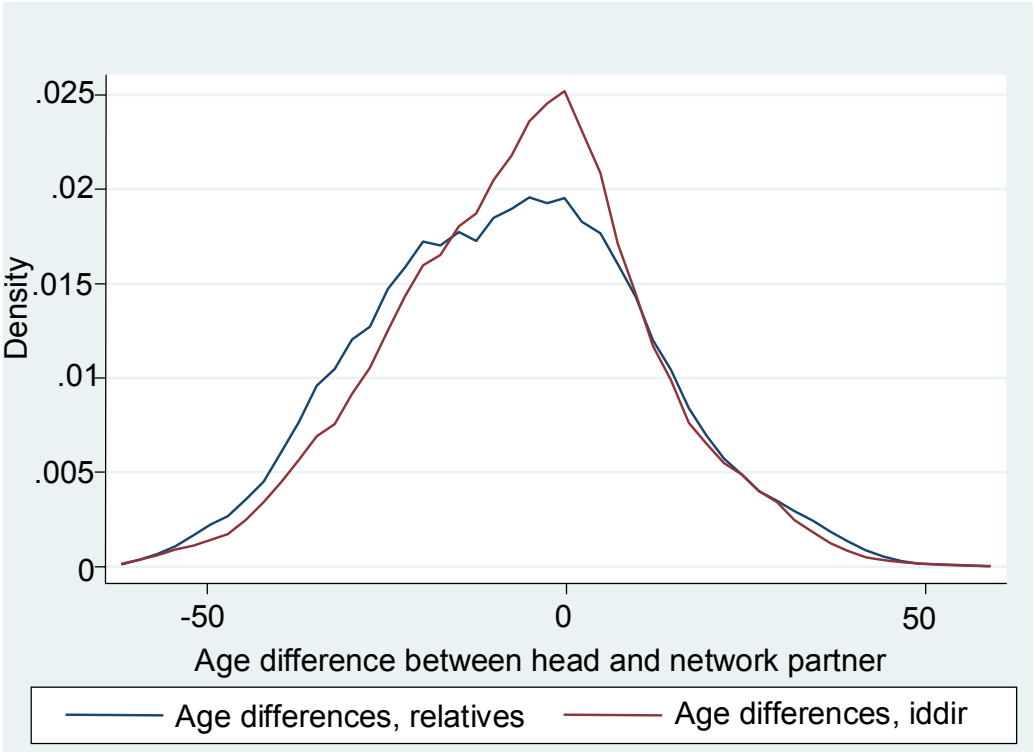

Figure 3: Ratio of cash grants and loans to monthly *iddir* income