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ORIGINAL PAPER

# Giving to family versus giving to the community within and across generations

**Partha Deb · Cagla Okten · Una Okonkwo Osili**

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**Abstract** In this paper, we examine the impact of parental giving on the transfer behavior of adult children to family members and community institutions using unique data from the Indonesian Family Life Surveys. Our findings point to persistence of private transfer networks across generations. In particular, the community transfer decisions of adults living outside origin households are positively influenced by the origin household's community giving. We also investigate the relationship between household transfers to family and community networks. We find that unobserved heterogeneity in giving to family members and community organizations is positively correlated, suggesting important complementarities between transfer networks.

**Keywords** Family transfers · Community institutions · Role model effect

**JEL Classification** O12 · J13 · D10

*Responsible editor:* Deborah Cobb-Clark

P. Deb
Departments of Economics, Hunter College and the Graduate Center,
City University of New York, New York, NY 10065, USA

C. Okten
Department of Economics, Bilkent University, Bilkent, Ankara, 06800 Turkey

U. O. Osili (✉)
Department of Economics, Indiana University-Purdue University
at Indianapolis, 425 University Boulevard, Indianapolis, IN 46202, USA
e-mail: uosili@iupui.edu

## 1 Introduction

Understanding what leads individuals to transfer resources to those outside one's immediate family is a fundamental issue within social sciences. In this paper, we present new evidence on two understudied aspects of private transfer behavior. First, we investigate the role of the family in shaping transfer choices across generations. There are several mechanisms through which patterns of giving may be correlated across parents and their adult children. Children may learn about giving to the family and to community organizations by observing their parents' behavior at an early age and retain these habits when they establish their own households. It is also possible that parents attempt to directly shape children's preferences towards giving to the family or to the community through their actions (Cox and Stark 1998; Jellal and Wolff 2000). Parental influences in giving behavior may also arise because income and wealth tend to be highly correlated among family members (Grawe and Mulligan 2002). Finally, correlations in parent–child transfer behavior may be attributed to shared tastes and preferences.

Second, we focus on the relationship between transfers to family and community networks and investigate empirically whether transfers to family and community networks are substitutes or complements. In a seminal paper, Becker (1974) provides a framework for studying interactions between giving to family and giving to community organizations. Despite a growing literature on private transfers, there exists a large gap in knowledge concerning the relationship between transfer networks.[1] Family and community networks may be substitutes if both networks provide similar services such as mutual insurance and credit to households (Banfield 1958; Fukuyama 1995; Putnam 1993). However, giving to family and giving to community networks may be complementary due to altruism, common tastes for generosity (some of which are unobservable to the researcher), and other factors, such as resource constraints, social norms, technology, and shocks (Coleman 1990; LaFerrara 2003). Both types of transfer behavior may be motivated by exchange and/or "warm glow" considerations (Andreoni 1990). Since there are theoretical arguments for both the substitutable and complementary nature of the two networks, the true nature of their relationship is ultimately an empirical question.

The empirical analysis in this paper is based on new data from the Indonesia Family Life Surveys (IFLS). The IFLS data are unique because they contain detailed information on transfers to family members and transfers to community institutions. We are unaware of other household surveys (either from a developed or developing country source) that can provide such a comprehensive picture of both family- and community-level transfer networks. For example, most household surveys from developing countries emphasize transfers among

[1] Recent studies have analyzed either private transfers to family members (Altonji et al. 1997) or private contributions to charitable institutions (Auten et al. 2002; Andreoni et al. 2003).

family members and provide very little information on transfers to community organizations. In contrast, surveys from developed countries often provide extensive information on transfers to community institutions but offer a less complete view of family-based transfer networks. To explore parental role in transfer choices (family vs community), we link a sample of adults living on their own in 1997/1998 to their origin households in 1993/1994.

Indonesia represents a rich institutional environment to study the connections between family and community networks, with its diverse population of nearly 250 million. Unlike many developed countries, public transfers in Indonesia tend to be limited in scope, and few tax-related incentives for transfer behavior exist. Both family and community networks perform important roles in Indonesia. Vital services, including health care, child care, and old-age support are mainly provided through family and community networks. Presumably, these services can be complementary in nature. For example, in the health sector, Frankenberg and Thomas (2001) discuss the role of neighborhood health posts (*posyandu*) in delivering key health services.[2] Health care provided by the family may complement these services. However, informal insurance may be an area where the services provided by the two networks are substitutable in nature. The descriptive literature suggests that family and community networks often interact in important ways in informal insurance and credit markets.[3] A household that resides in a community with well-functioning community insurance mechanisms may have a reduced need for extensive familial transfers, in which case community and family networks would be substitutes rather than complements.

We adopt a novel econometric approach, which recognizes the interdependence of transfer amounts to family and community within generations and fully accounts for correlations in the error structure of the transfer equations across generations. Specifically, we estimate a quadrivariate system of Tobit simultaneous equations using full-information maximum simulated likelihood (MSL). This allows us to explore the relationship between transfers to the family and transfers to the community. By taking into account the endogeneity of giving across generations, we are able to determine if parental influences persist after we have controlled for the indirect effects of unobservables, including shared budget constraints, common shocks, and tastes within the family.

Our results on transfer behavior suggest that parental giving has an important effect on the transfer behavior of adult children. However, estimation methods, which do not account for the endogeneity of parental giving, can yield

[2]Through the INPRES desa (Village Development Program), the central government provided funds for the construction of health clinics (posyandus). Communities, in turn, were expected to provide volunteer labor, building materials, and monetary resources for use with central government transfers.

[3]Several authors have studied systems of private networks of support and mutual assistance that exist in developing countries (see Alderman and Paxson 1992; Cox and Jimenez 1990; Morduch 1999 for a detailed review of this literature.)

a naive picture of parental effects within family networks. Results on giving to the community suggest a positive correlation across generations, with larger parental effects after we have controlled for endogeneity of parental giving. We find that unobserved heterogeneity in family and community giving tends to be (weakly) positively correlated within a generation.

The paper is organized as follows: In Section 2, we provide a conceptual framework to our study including some background on family and community networks in Indonesia. In Section 3, we describe the econometric model, estimation techniques, and some computational issues. We describe the data sources in Section 4 and present results in Section 5. Section 6 presents conclusions.

## 2 Conceptual framework

### 2.1 The setting

Indonesia is somewhat unique in its centralized system of community organizations. This allows us to study patterns of contributions because organizations are comparable across regions. In Appendix A, we present evidence on the relative importance of specific community organizations based on the incidence of transfers.[4] In our data, households may contribute time, money, or materials to a community meeting, a women's group, an irrigation association (*subuk*), a neighborhood security arrangement, rice cooperatives, and neighborhood health posts (*posyandu*)—all these groups can be classified as community-level organizations.

### 2.2 The role of the family in shaping transfers to family and community organizations

Our first empirical question is whether parents' participation in family and community networks affects their children's participation in such networks. A growing literature emphasizes that the family can play an important role in the transmission of social norms, preferences, and knowledge about networks across generations—thus influencing the weights that children place on giving to family and community networks.[5] For example, a young child may observe

[4]Our data do not include religious or purely social groups—and these are not included in our analysis. Our study focuses mainly on monetary transfers due to concerns that time transfers are more likely to be measured with error. We should also note that household heads may report contributions to more than one community organization.

[5]Cox and Stark (1998) provide an influential model of intergenerational family transfers, termed the "demonstration effect" in which parents send transfers to their (elderly) parents, in order to shape their children's preferences, and to ensure that they will receive old-age support from their children (see also Arrondel and Masson 2001; Jellal and Wolff 2000). However, parental actions may shape the transfer behavior of their adult children even in cases where children's transfer choices do not yield clear parental benefits.

parents being generous to family members, and this induces that child to be more generous to family (and, perhaps, to community members) as an adult. We adopt the term "role model" to capture the direct effect that parental behavior can have on the transfer decisions of adult children. Role model effects potentially cover both social learning and imitation. However, we recognize that parent–child correlations in transfer behavior may also be due to common family characteristics, rather than role model effects. For example, common endowments, technology, and shocks (some of which are unobservable to the researcher) may lead to parent–child correlations in transfer behavior. Economic theory provides an important role for preferences and budget constraints in the household's transfer choice. If individuals learn only from their own experiences, then transfer choices may be unrelated across generations after we have controlled for the role of budget constraints and shocks. However, preferences may be shaped by parents who serve as role models for their adult children, which would lead to correlations in transfer choices across parents and their adult children living outside their household of origin.

The transmission of norms and values across generations may occur for a variety of reasons. Parents may transfer social norms to their children out of a sense of obligation to share knowledge about the benefits and costs of transfer networks, even where parents do not benefit directly from the children's transfer choices. Furthermore, preference shaping and transmission of norms may not always be intentional. Children may simply imitate their parents and adopt their patterns of transfer behavior when they establish their own households.

Next, we present a simple model in which parents serve as role models. Children start out with no initial knowledge ($k_0$) on the net benefits of making transfers within a given transfer network. Let $j$ refer to a network such that $j \in \{f, o\}$, where $f$ represents the family network and $o$ represents the network of community organizations. Information accumulation is a function of parental inputs $P_j$, a key aspect of which is parents' transfers to network $j$, and external sources of knowledge, $E_j$. In the equation below, the parameter $a_j$, measures an individual's specific capacity at a given age $i$ to learn about transfer network $j$.

Following Chiteji and Stafford (1999), in simple linear form, we postulate that the child's knowledge of net benefits from participating in a given transfer network, $\dot{c}_j$, are given as follows:

$$\dot{c}_j = a_j P_{ji} + E_{ji} - \delta k_j \tag{1}$$

Suppose that this process operates over the period prior to when the child forms his or her own household, and this knowledge in conjunction with income and other variables shapes the network participation decision of the child when he forms his own household. In other words, the derived demand for services from network $j$ is $s_j$ and is a function of knowledge on the net

benefits on network $j$, and a vector of observed and unobserved individual characteristics, such as income, and demographic characteristics $(Z)$.

$$s_j = S\left(k_j, Z\right) \tag{2}$$

We will assume that derived demand for services from network $j$ is increasing in knowledge on that network $(S_1 > 0)$. In the presence of role model effects, then $a_j > 0$ and $\frac{\partial k_j}{\partial P_j} > 0$. This implies that the derived demand for services $\left(s_j\right)$, and transfers $\left(t_j\right)$ to network $j$ will be increasing in parental inputs, $P_j$. More formally,

$$\frac{\partial s_j}{\partial P_j} > 0\,; \quad \frac{\partial t_j}{\partial P_j} > 0 \tag{3}$$

In other words, if parental transfer choices and other parental actions provide information on the net benefits of participating in social networks, then we expect that transfer choices of children will be significantly correlated with those of their parents. We recognize that household wealth, shocks, demographic variables, and external influences such as religious and community influences can also affect transfer choices. Some of these factors are less measurable by the researcher, which means that it is important to account for the unobserved factors that may indirectly affect transfers to a given network.

### 2.3 The relationship between family and community networks within a generation

Our second empirical question is whether transfers to family and transfers to the community are related. Private transfers to family members and/or community organizations may be motivated by altruism or exchange considerations. The "warm glow" motive, in which individuals derive intrinsic benefits from their contributions to family members or the community, has also been used to explain private transfers (Andreoni 1990). Within the exchange framework, whether transfer networks can be regarded as substitutes, complements, or unrelated will depend on the relationship between the services provided by the family network and the community network, respectively.

With altruism, individuals transfer resources because they care about the welfare of the family and community members. Under exchange considerations, family and community networks can provide important current and future economic benefits such as insurance and credit and mutual labor exchange, as well as noneconomic benefits such as caring, social status, and group membership. Existing research suggests that private transfers of income and in-kind services within the family cannot be explained by simple models of altruism (Cox 1987; Altonji et al. 1997). However, there is much less evidence on the motivations for transfers to community organizations. Okten and Osili (2002) find evidence for the exchange motive in their study of transfers to community organizations in Indonesia.

## 3 Econometric framework

In this section, we present an econometric model, which consists of a system of four transfer equations—two for each generation of a given household (denoted parents and children). Each of the transfer equations for a given generation represents giving to the family and to the community, respectively. We present the transfer equations in detail below. Our econometric framework is designed to incorporate the following features. First, we investigate role model effects by incorporating the transfers of parents as covariates in the transfer equations of their adult children and allowing for correlated errors across generations. It is also important to account for the fact that giving with a given network may be correlated across generations due to unobserved income and wealth, prices, and network characteristics. In general, estimates of role model effects in transfer behavior may be biased if we ignore the correlation in the error terms across generations. Consistent with theoretical models of private transfers and our conceptual framework, we assume that, while giving by parents may influence the giving of their adult children (living in separate households), the reverse is not true.[6] Second, we allow for the possibility of transfers to family and community organizations being substitutes or complements depending on the relationship between the services provided by the family and community networks, respectively. Specifically, the error terms for the equations for transfers to family and transfers to community organizations may be correlated within each generation. Finally, transfers to family and community networks are specified as latent processes because they are censored in a significant number of cases. In particular, when zero transfers are observed, we are unable to determine whether the household has chosen not to transfer resources or whether transfers were not sent in the survey period. The Tobit-based specification we have chosen is an attempt to allow for censoring and distinguish between the decision to transfer and the amount transferred.

### 3.1 Model

Let $y^*_{pf}$, $y^*_{po}$, $y^*_{cf}$, and $y^*_{co}$ denote the latent propensities to give financial transfers by parents $p$ and their children $c$ to other members of their families $f$ and to community organizations $o$, respectively. The observation subscript is omitted for notational convenience. Let $y_{gr}$, where generation $g = (p, c)$ and recipient $r = (f, o)$ denote the observed outcome that is related to the latent variable by $y_{gr} = y^*_{gr}$ if $y^*_{gr} > 0$, $y_{gr} = 0$ if $y^*_{gr} \leq 0$. In the empirical analysis below, we use the labels, parents and children, to describe the relationship between two related generations of households. It is important to note that the IFLS data on origin households and their split-offs contain mostly biological

[6] We explore the implications of this assumption in the empirical section of the paper.

child–parent pairs but also includes, more broadly, other adult family members who have left their household of origin and established their own households.

Let

$$y^*_{pf} = x_p\beta_{pf} + u_{pf} + \varepsilon_{pf} \tag{4}$$

and

$$y^*_{po} = x_p\beta_{po} + u_{po} + \varepsilon_{po} \tag{5}$$

describe the latent processes underlying transfers by parents to family and community, respectively. $x_p$ is a vector of parent household characteristics such as income, age, sex, urban residence, and other variables, and $\varepsilon_{pr}$ and $u_{pr}$, where $r = (f, o)$, are error terms described in detail below. The latent processes for transfers to family and community by children are given by

$$y^*_{cf} = x_c\beta_{cf} + y_{pf}\delta_{ff} + y_{po}\delta_{cf} + u_{cf} + \varepsilon_{cf} \tag{6}$$

and

$$y^*_{co} = x_c\beta_{co} + y_{pf}\delta_{fc} + y_{po}\delta_{cc} + u_{co} + \varepsilon_{co}, \tag{7}$$

respectively. $x_c$ is a vector of child-household characteristics, including age, sex, urban residence, and other variables; $\varepsilon_{cr}$ and $u_{cr}$, $r = (f, o)$ are error terms. Parental or role model effects are assumed to be transmitted via the amounts of transfers by parents, $y_{pf}$ and $y_{po}$, which enter the children's latent processes. The parameters associated with the transfer-variables are denoted by $\delta$.

As shown in Eqs. 4–7, the error term in each equation is decomposed into two parts. The $\varepsilon_{gr}$, $g = (p, c)$ and $r = (f, o)$ are assumed to be mutually independent and are drawn from unit normal distributions. We assume $\varepsilon_{gr}$ has unit variance because the variances of $u_{gr}$ and $\varepsilon_{gr}$ cannot be separately identified. Furthermore, we assume that $u_{gr}$ and $\varepsilon_{gr}$ are independent of each other for each $g$ and $r$. Common unobserved heterogeneity between recipient types within generations, between generations within recipient types, and between recipient types, across generations is captured by correlations between the $u_{gr}$. We assume that $\mathbf{u} = [u_{pf}\ u_{po}\ u_{cf}\ u_{co}]'$ follows $\mathbf{N}(\mathbf{0}, \boldsymbol{\Sigma})$ where $\mathbf{0}$ is a $4 \times 1$ vector of zero means and $\boldsymbol{\Sigma}$ is a $4 \times 4$ covariance matrix given by

$$\boldsymbol{\Sigma} = \begin{bmatrix} \sigma_{pfpf} & \sigma_{pfpo} & \sigma_{pfcf} & \sigma_{pfco} \\ \sigma_{pfpo} & \sigma_{popo} & \sigma_{pocf} & \sigma_{poco} \\ \sigma_{pfcf} & \sigma_{pocf} & \sigma_{cfcf} & \sigma_{cfco} \\ \sigma_{pfco} & \sigma_{poco} & \sigma_{cfco} & \sigma_{coco} \end{bmatrix}.^{7} \tag{8}$$

[7]This matrix is symmetric by definition but is not necessarily positive definite. Because it is a covariance matrix, it should be positive definite and symmetric. We check positive definiteness of $\boldsymbol{\Sigma}$ at each iteration of the estimation algorithm using its eigenvalues. Parameters are forced away from the invalid region using a penalty function. In practice, our experience is that nonpositive definiteness of $\boldsymbol{\Sigma}$ is not an issue. In preliminary work, we also estimated models in which, instead of specifying $\boldsymbol{\Sigma}$ directly, we specified a lower triangular matrix $\boldsymbol{\Lambda}$ such that $\boldsymbol{\Sigma} = \boldsymbol{\Lambda}\boldsymbol{\Lambda}'$. This formulation ensures a symmetric and positive definite $\boldsymbol{\Sigma}$ and a unique $\boldsymbol{\Lambda}$ for any $\boldsymbol{\Sigma}$. Although estimates of $\boldsymbol{\Lambda}$ were stable, we found the implied values of $\boldsymbol{\Sigma}$ to be less stable than our preferred parametrization.

Conditional on $u_{gr}$, the structure of each equation is in the form of a Tobit and the joint likelihood $L|\mathbf{u}$ is the product of each of the marginal likelihoods conditional on $\mathbf{u}$.[8] That is,

$$L|\mathbf{u} = \prod_r \left\{ \begin{array}{l} \left[1 - \mathbf{\Phi}(x_p\beta_{pr} + u_{pr})\right]_{(y_{pr}=0)} \\ \left[\dfrac{1}{\sqrt{2\pi}} \exp\left(-\dfrac{1}{2}(y_{pr} - x_p\beta_{pr} - u_{pr})^2\right)\right]_{(y_{pr}>0)} \\ \left[1 - \mathbf{\Phi}(x_c\beta_{cr} + y_{pf}\delta_{fc} + y_{po}\delta_{cc} + u_{cr})\right]_{(y_{cr}=0)} \\ \left[\dfrac{1}{\sqrt{2\pi}} \exp\left(-\dfrac{1}{2}(y_{cr} - x_c\beta_{cr} - y_{pf}\delta_{fc} - y_{po}\delta_{cc} - u_{cr})^2\right)\right]_{(y_{cr}>0)} \end{array} \right\} . \quad (9)$$

where the $(y_{gr} = 0)$ and $(y_{gr} > 0)$ subscripts denote the limit and nonlimit observations, respectively, and $\mathbf{\Phi}$ is the standard normal distribution function. In the empirical implementation, when transfers are positive, we use their logarithms as the observed outcomes.

The expression in Eq. 9 cannot be maximized directly because the $u_{gr}$ are unknown. However, since the distribution of $\mathbf{u}$ has been specified, it can be integrated out of the likelihood

$$L = \int_{\mathbf{u}} (L|\mathbf{u})\, f(\mathbf{u}) d\mathbf{u}. \quad (10)$$

The integral above is over the domain of a quadrivariate normal density and, thus, does not have a closed form. Therefore, the likelihood function cannot be calculated analytically. The MSL approach is a powerful way to implement maximum likelihood when the likelihood function does not have analytical representation (Lee 1992; Gourieroux and Monfort 1996). The key insight of the method is that the integral expression in Eq. 10 may be written as the expectation expression,

$$L = \mathrm{E}(L|\mathbf{u}) \quad (11)$$

with respect to the density of $\mathbf{u}$, $f(\mathbf{u})$. The MSL estimator involves replacing the expectation by a simulated sample analog (average), i.e.,

$$\widetilde{L} = \frac{1}{S}\sum_{s=1}^{S} (L|\widetilde{\mathbf{u}}_s), \quad (12)$$

where $\widetilde{\mathbf{u}}_s$ is the $s^{\text{th}}$ draw (from a total of $S$ draws) of a four-vector of random numbers from the density $\mathbf{N}(\mathbf{0}, \mathbf{\Sigma})$ and $\widetilde{L}$ denotes the simulated likelihood.

[8] Ideally, it would be preferable to allow our explanatory variables to affect the decision to transfer resources differently than their effects on the amounts transferred. Such a system might be based on a set of generalized Tobit equations, for example, with a probit equation for the decision to transfer and a linear equation for the amounts transferred conditional on positive transfers. However, because our sample size is relatively small, we found such a system to be computationally infeasible.

Provided that $S$ is sufficiently large, maximization of the simulated likelihood is equivalent to maximizing the likelihood. In cases of multidimensional expectations such as ours, a large number of pseudorandom draws is required to achieve suitable levels of accuracy. Instead, we implement a new acceleration technique using quasirandom draws based on Halton sequences (Bhatt 2001; Train 2002).

We maximize the simulated likelihood using a quasi-Newton algorithm requiring only first derivatives. Once convergence is achieved, the covariance matrix of the MSL estimates is obtained using the robust sandwich formula because it correctly incorporates simulation noise, while other formulae do not (McFadden and Train 2000).

### 3.2 Identification

In principle, the system of Tobit equations is parametrically identified without any exclusion restrictions. We do not rely on parametric identification, however, as our conceptual framework provides natural exclusion restrictions. Parent-household characteristics, which enter the parent equations but not the child equations, are the sources of identifying information. We have also considered less restrictive models in which some parent characteristics, but not all, are included in the child equations. One such model, which includes parents' household expenditure (or income) in the children's equations, is substantively important, and this is described in more detail below.

In each of these specifications, we find that the excluded instruments are highly jointly significant, i.e., they are relevant. There are, however, no standard overidentification tests in the context of nonlinear simultaneous equations models such as ours. Nevertheless, to provide evidence on the exogeneity of the instruments, we conduct Hansen's test for overidentification in linear simultaneous equations models (the J-statistic) estimated separately for giving to family and giving to community organizations. The null hypothesis of exogeneity was not rejected in any of the specifications we considered.

## 4 Data

The empirical analysis in this paper is based on data from the IFLS, conducted by RAND and the University of Indonesia. The IFLS data are particularly well suited for the study of transfer choices within family and community networks. As mentioned earlier, data sources that provide microlevel evidence on transfers to both family members and community organizations are relatively scarce. The IFLS survey was first conducted in 1993/1994 (IFLS1), with a follow-up in 1997/1998 (IFLS2), and contains about 7,500 households. We focus on the second wave of the survey because only limited information on transfer networks is available in the first wave of the survey (IFLS1). In addition, the IFLS2 survey contains approximately 767 pairs of origin households and their split offs, which allows us to examine role model effects

in transfer choices.[9] The origin–split off pairs are mainly composed of parent heads of the households and their adult children who have established their own households (Appendix B). For this reason, we maintain the labels parents and children to describe the relationship between the two generations of the IFLS1 household.

To investigate parental or role model effects in transfer behavior, we use a matched sample of origin household or "parents" and their split offs or "children" in the second wave of the survey (IFLS2). Adults who were residing with their origin household in 1993/1994 (IFLS1) but have since established their own households comprise the child sample. This matched sample provides direct measures of transfers within family- and community-based networks for both parent households and their children living outside the household.

We face some data limitations in studying intergenerational linkages in transfer behavior because detailed information on family and community transfer choices for parent households and their children is only available for 1997/1998 (IFLS2).[10] Ideally, information on family and community transfers for parent households prior to the time period in which the child establishes his or her own household would also be useful in studying role model effects. Data from a single time period are likely to provide an imperfect measure of the importance of role model effects in transfer behavior. With these caveats in mind, we proceed to discuss transfers to family and community networks and characteristics of the parent household and child samples.

The main dependent variables of interest are financial transfers within the family and within the community network. Our measure of "giving to the community network" is defined as the log of total monetary transfer (in rupiah) to community organizations in the 12 months preceding the interview. In the empirical analysis, data on transfers to siblings and to the community are measured for the head of the household. We define "giving to the family" as the log of total monetary transfer (in rupiah) to all siblings living outside the household in the 12 months preceding the interview. In the postindependence era, official government literature has emphasized *gotong royong*, or community participation, as a central part of Indonesia's national development strategy (Bowen 1986).[11] Individuals are asked detailed questions about their

[9]See Frankenberg and Thomas (2000) for a detailed description of the IFLS surveys. The joint parent–child sample is limited to households for which the "sent transfers to family" variable is not missing.

[10]We find very low correlations in community transfer decisions between IFLS1 and IFLS2, and we attribute this low observed correlation ($r = 0.02$) to significant differences in the survey instrument on community transfers across the two waves of the survey.

[11]To accomplish this end, the government promoted the adoption of a uniform system of local government (through village councils and neighborhood organizations) across Indonesia's 27 provinces. Thus, in key sectors of community and village life, such as education and health, the production and delivery of services relied on a common framework of local government.

contributions (cash, materials, and time transfers) to family members and to specific community organizations.[12]

Recent studies highlight the importance of family transfers and coresidence in Indonesia (Cameron and Cobb-Clark 2006). Our preferred measure of giving within the family network is total transfers to siblings because other types of family transfers (notably, transfers to parents and children) are more likely to be affected by endogeneity bias. In particular, we only observe upward transfers (child to parent) or downward transfers (parent to child) for non-coresiding parents and children living outside the household. Since parental coresidence and the number of children residing within the household may be endogenous choice variables within the context of parent–child transfers, we focus on sibling transfers. However, we also examine the robustness of our results using a broader view of family giving, which includes both transfers to parents and siblings. A major strength of the IFLS data is their inclusion of detailed information on family members living outside the household.

Table 1 provides an overview of individual, family, and community variables used in our analysis. Community organizations in Indonesia provide a range of local public goods – health care, sanitation, irrigation, and neighborhood security – in addition to performing safety net functions. Community organizations often provide services that do not have clear market substitutes. For example, through contributions to community meetings, households may gain access to mutual insurance and credit and obtain in-kind assistance with household/farm chores and child care. However, from the onset, we should note that some of the services provided by community organizations can also be provided by family members and through networks of friends, kin, and coworkers. In Appendix A, we present descriptive evidence on giving to community organizations. We also provide detailed information on the relative importance of specific community organizations based on whether heads of origin households and split households contribute to these organizations. We should also note that household heads may contribute to more than one community organization. For both origin and split household heads, contributions to community meetings are an important way of participating in the community network.[13]

Our measure of giving within transfer networks has some limitations. We classify individuals as participating in a network only if they transfer resources in the survey period. This measure may not reflect both transfer history and future participation decisions. Ideally, we would like to measure net

[12] In our sample, community organizations are largely economic in orientation. In this way, our focus differs from other studies that have examined participation in social, religious, and political groups.

[13] There are a few notable differences in contribution patterns of origin and split households. For example, contributions to women's groups are more prevalent for split individuals than for origin households. Part of the explanation may lie in differences in gender of the household head. From Table 1, while origin heads are more likely to be male (77%), male headship is less common in the split households.

**Table 1** Summary statistics

| | Parent sample (origin—1993 IFLS1 household) | Kid sample (adults who have left origin households and established their own households since IFLS1—1993) |
|---|---|---|
| | Mean | Mean |
| Transfer variables | | |
| Sent transfer to siblings (in Rupiah) | 0.36 | 0.47 |
| Total transfer to siblings (in Rupiah) | 32,000.83 (180,671.20) | 42,853.85 (126,449.10) |
| Sent transfer to community (in Rupiah) | 0.23 | 0.16 |
| Total transfer to community (in Rupiah) | 11,849.86 (105,076.80) | 3,438.25 (25,283.70) |
| Individual characteristics | | |
| Age | 52.13 (12.99) | 29.81 (12.81) |
| Marital status (married = 1) | 0.77 (0.42) | 0.72 (0.45) |
| Male (=1) | 0.79 | 0.45 |
| Religion (Muslim = 1) | 0.91 | 0.92 |
| Years of schooling | 5.46 (4.28) | 7.97 (4.01) |
| Per capita household expenditure (in Rupiah) | 177,484.50 (260,008.00) | 198,734.70 (206,124.50) |
| Household size | 7.21 (2.97) | 3.74 (1.99) |
| Number of children under 14 in household | 0.68 (0.89) | 0.39 (0.73) |
| Urban | 0.45 | 0.49 |
| Parents' characteristics (Based on reports) | | |
| Number of surviving parents | 0.48 (0.69) | 1.50 (0.71) |
| Parent coresiding? | 0.05 | 0.12 |
| Sibling characteristics | | |
| Number of economically active siblings | 4.45 (3.17) | 3.84 (2.94) |

Number of observations = 767. Standard deviations are shown in parentheses (kids are defined as adults who have left their original IFLS1 household and have established their own households since 1993). Parent sample (kid sample) is restricted to those households for which "Sent transfers to Sibling" variable is not missing.

transfers to family and community networks. However, the IFLS2 survey asks whether individuals received specific types of benefits (money, goods, other) from community organizations but does not provide the monetary value of benefits received from the community network. Clotfelter (1992) discusses further problems associated with measuring benefits received from community organizations.[14] It is also possible to expand our definition of giving within a network to include time transfers; however, time transfers are often less precisely measured, particularly within the family network.

[14]Benefits may not be tangible goods and services that can be observed by the researcher. Furthermore, benefits from community organizations may only become apparent over a much longer time horizon.

To measure household economic resources for parent and child households, we rely on annual per capita household expenditure (which includes both market-purchased consumption and home-produced consumption). This measure of household resources can be described as an approximation to the household's average lifetime income or permanent income. Alternative measures of household's economic position, such as per capita annual income, are highly affected by temporary shocks and fluctuations. We also note that the accurate estimates of the market value of household assets may be difficult to construct where markets for land and housing are less developed, and this may be the case for many rural households in our sample. Nevertheless, we examine sensitivity to alternate measures of household resources in a series of robustness checks.

### 4.1 Parent household

We include variables that capture the socioeconomic and demographic characteristics of the head of the parent or origin household, including age, sex, years of schooling, marital status, gender, and religion (Muslim = 1). Household size, number of children, and per-capita expenditure in the household are used to capture resources and constraints within the household that may influence the individual's participation in giving within the family or community network.

Table 1 also presents summary statistics for each generation. From Table 1, the mean age for parent household heads in our sample is over 50. Parent household heads are also more likely to be married (about 77% of these heads are married.) To control for regional variation in our data, we construct province dummies. Province dummies reflect differences in ecological environments, resource endowments, population density, and other sociocultural variation across regions.

### 4.2 Child household

From Table 1, the child sample is composed of younger individuals (the mean age here is 29.81 years compared to the origin household sample, where the average age is 52.13 years). Household heads in the child sample are slightly less likely to be married (about 70% of the child sample is married), and have higher levels of educational attainment compared to the parent household sample. The average number of economically active siblings is slightly higher for the parent households (the average number of siblings is 3.84 for the child sample vs 4.45 for the parent household head).

We note that there are interesting differences in transfer variables between the child and parent samples. Nearly half of the child sample reports making a transfer to siblings, while only 36% of parent households report a sibling transfer. When we examine community transfers, however, a different picture emerges. In particular, parent households have a higher incidence of participation in the community network (23% of parent household heads vs 16% of the child sample report making a community transfer).

## 5 Results

Our results are based on a system of Tobit equations as described above. Parameter estimates along with robust standard errors are reported in Tables 2, 3, and 4. Giving within a family (community) network is defined as the log monetary transfer to siblings (community institutions) during the survey year. As discussed earlier, we focus on sibling transfers as our key measure of giving within the family network because other types of family transfers – notably, transfers between parents and children – are more likely to be affected by sample selection bias. We begin by briefly discussing results from a model that assumes exogeneity of origin household transfers. Next, we describe results from the model that allow for endogeneity of origin household transfers. We end this section by describing some substantively important specification checks.

### 5.1 Estimates (assuming exogeneity of origin household transfers)

In the empirical work, we first investigate the role of the family in shaping transfer choices. When parent household transfers are assumed exogenous (Table 2), the parent household impact (or role model effect) on transfers to family members is negative but statistically insignificant. However, we do find evidence for a positive and statistically significant role model effect for transfers within the community network. We note that parental transfers are likely to be an endogenous variable within the child's transfer equation. In the next section, we investigate whether these results persist after accounting for the endogeneity of parent household transfer behavior. The issue of endogeneity is an important one here because there may be common unobserved heterogeneity in the transfer equations of parents and their children.

We also investigate the correlation between giving to family and community networks. The correlation between the error terms in the transfer equations for giving to the family and giving to the community is 0.05 for each of the parent and child samples. After we have accounted for household expenditure and other observables, common unobserved variables including lifetime wealth, tastes, shocks, and prices may induce a positive correlation between transfers to family and community for parent households.

### 5.2 Estimates (with endogeneity of origin household transfers)

In Table 3, we find that accounting for the endogeneity of parent transfers leads to a positive and significant parental effect in family giving for the child sample. A 10% increase in the origin household's family transfer amount is associated with a 1.6% increase in family giving for children living outside the origin household. Thus, when we allow for the endogeneity of the origin household's transfer choices, we obtain a strikingly different picture in that there is a positive and significant parental effect on children's transfers to family members.

**Table 2** Tobit model with exogenous role model effects

| Independent variable | Log transfer to siblings (parent household) | Log transfer to the community | Log transfer to siblings (kid household) | Log transfer to the community |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Individual characteristics | | | | |
| Age | −1.96 (0.65) | −1.87 (0.91) | 1.64 (0.58) | 1.20 (0.84) |
| Age squared | 0.15 (0.06) | 0.18 (0.09) | −0.22 (0.07) | −0.18 (0.11) |
| Marital status (married = 1) | 1.17 (0.59) | 1.23 (0.60) | 1.02 (0.41) | 3.01 (0.74) |
| Male (=1) | −1.11 (0.52) | 0.30 (0.69) | −0.28 (0.32) | 1.00 (0.34) |
| Religion (Muslim = 1) | 1.47 (0.81) | 0.01 (0.67) | 1.45 (0.59) | −1.84 (0.80) |
| Years of schooling | −0.04 (0.05) | 0.04 (0.05) | 0.01 (0.05) | −0.07 (0.05) |
| Per-capita household expenditure ($\times 10^8$) | 1.06 (0.16) | 0.71 (0.19) | 0.91 (0.18) | 0.63 (0.20) |
| Household size | 0.02 (0.07) | 0.03 (0.07) | 0.07 (0.09) | −0.05 (0.09) |
| Urban | −0.12 (0.44) | −0.85 (0.47) | 0.16 (0.35) | 0.41 (0.26) |
| Constant | −2.19 (1.73) | −3.39 (2.62) | −8.39 (1.37) | −8.64 (1.40) |
| Log transfer to siblings (parent household) | | | −0.08 (0.09) | −0.11 (0.10) |
| Log transfer to community (parent household) | | | 0.08 (0.12) | 0.27 (0.13) |
| No. of observations | 767 | | 767 | |
| Log likelihood | −1,609.93 | | −1,667.59 | |
| No. of simulations | 3,000 | | 3,000 | |

Tobit model with exogenous role model effects with exogenous parent household transfers. The dependent variables are the natural logarithm of the (transfer amount + 1). Dependent variables are the log financial transfer to siblings and community organizations in the survey year (measured in Rupiah). We include province dummies to control for regional variation. Standard errors are shown in parentheses.

**Table 3** Quadrivariate Tobit model with endogenous role model effects

| Independent variable | Transfer to sibling (parent household) | Transfer to community | Transfer to sibling (kid household) | Transfer to community |
|---|---|---|---|---|
| Individual characteristics | | | | |
| Age | −0.62 (0.62) | −0.02 (0.55) | 1.73 (0.61) | 1.53 (0.63) |
| Age squared | 0.03 (0.06) | 0.02 (0.05) | −0.23 (0.08) | −0.22 (0.08) |
| Marital status (married=1) | 2.03 (0.68) | 1.72 (0.69) | 1.00 (0.35) | 3.31 (0.49) |
| Male (=1) | −1.49 (0.67) | 0.37 (0.45) | −0.43 (0.29) | 1.20 (0.30) |
| Religion (Muslim = 1) | 2.14 (0.58) | 0.63 (0.49) | 1.97 (0.50) | −0.88 (0.42) |
| Years of schooling | −0.05 (0.06) | 0.02 (0.05) | 0.02 (0.04) | −0.04 (0.05) |
| Household characteristics | | | | |
| Per-capita household expenditure ($\times 10^8$) | 1.06 (0.17) | 0.85 (0.16) | 0.88 (0.18) | 0.83 (0.19) |
| Household size | 0.03 (0.06) | 0.09 (0.06) | 0.09 (0.09) | −0.04 (0.08) |
| Urban | −0.01 (0.32) | −0.58 (0.42) | 0.11 (0.31) | 0.27 (0.37) |
| Constant | −7.22 (1.71) | −10.87 (1.59) | −9.29 (1.37) | −11.62 (1.29) |
| Log transfer to siblings (parent household) | | | 0.16 (0.08) | −0.56 (0.09) |
| Log transfer to community (parent household) | | | −0.02 (0.11) | 0.34 (0.11) |
| No. of observations | 767 | | | |
| Log likelihood | −3,265.86 | | | |
| No. of simulations | 3,000 | | | |

Quadrivariate Tobit model with endogenous role model effects with endogenous parent household transfers. Dependent variables are the log financial transfer to siblings and community organizations in the survey year. We include province dummies to control for regional variation. Standard errors are shown in parentheses.

**Table 4** Correlations of unobserved heterogeneity components

| | $u_{pf}$ | $u_{po}$ | $u_{cf}$ | $u_{co}$ |
|---|---|---|---|---|
| A. With exogenous parent (or role model) effects | | | | |
| $u_{pf}$ | | 0.05 | | |
| | | (0.0003) | | |
| $u_{cf}$ | | | | 0.05 |
| | | | | (0.0002) |
| B. With endogenous parent (or role model) effects | | | | |
| $u_{pf}$ | 1 | | | |
| $u_{po}$ | 0.06 | 1 | | |
| | (0.0002) | | | |
| $u_{cf}$ | −0.15 | 0.02 | 1 | |
| | (0.0003) | (0.0002) | | |
| $u_{co}$ | 0.31 | 0.05 | 0.05 | 1 |
| | (0.0003) | (0.0003) | (0.0002) | |
| Number of observations | 767 | | | |

Standard errors are shown in parentheses. The superscripts $(p, k)$ refer to the generation of the household, parent and kid household, respectively. The superscripts $(f, c)$ refer to the recipient type, family and community, respectively.

Our results on giving to the community also suggest a positive and significant parental role model effect on the community transfer decision. The origin household effect on community giving appears to be larger in the simultaneous equations model that takes into account the endogeneity of origin household transfers. A 10% increase in the origin household's community transfer amount is associated with a 3.4% increase in community transfers for adults living outside the origin household. Interestingly, parent's transfers to the family also have a negative and statistically significant effect on children's giving to the community. This result provides some evidence that family giving may crowd-out giving to the community across generations. In addition, parental giving to the community has a negative but insignificant effect on the child's giving to the family. We should note that results presented above suggest that estimation methods that do not account for correlations in error terms across generations may lead to a downward bias in the magnitude of the "role model" effect.

Our results in Table 3 indicate that household resources are a positive and statistically significant determinant of transfers within family networks and community transfers.[15] However, for parent households, we find that an

[15]We have also used household assets per capita and per capita household income (rather than expenditure) to capture household resources. Our estimates suggest that these alternative measures do not perform as well as per capita household expenditures based on a log likelihood comparison.

increase in per capita household expenditure has a larger positive effect on family transfers. We also find that marital status has a positive and statistically significant effect on family and community transfers. There are some important differences, however, for the child sample. In particular, we find that older households are more likely to transfer resources to family members for child households, while the effect is not significant for parent households. This may be explained by the differences in the demographic composition of the parent and child samples.

Estimates of the covariance structure of the four unobserved heterogeneity components of our empirical model are presented in Table 4. All estimates reported here are statistically significant. The results indicate that the correlation between the error terms in the transfer equations within a given generation for giving to the family and giving to the community is 0.06 for the parent household and 0.05 for the child sample. This supports our earlier findings that the unobserved heterogeneity components in family and community transfer decisions are positively correlated, although this correlation appears to be relatively weak. We also note that all but one of the correlations in error terms are positive. For example, the correlation in the error term for parents' family giving is positively correlated with children's giving to the community ($\rho = 0.31$). A positive correlation in error terms may be attributed to a positive correlation in unobserved wealth across generations. However, the correlation in the error terms for the family giving equation is negative across generations ($\rho = -0.15$) and statistically significant at the 1% level. A plausible explanation (as discussed earlier) is that sibling characteristics, some of which are unobserved in our analysis, may be negatively correlated across generations. These results emphasize the need to account for unobserved heterogeneity in estimating parental influences in transfer behavior. In our estimation, accounting for the endogeneity of parental giving does lead to striking differences in our estimates of parental or role model effects.

### 5.3 Additional specification checks

Although we have reported on a number of specification checks previously, a few additional ones deserve attention. The first of these examines whether there are differences in behavior for children who are biological children of the IFLS1 origin household head as compared to those who are other members of the origin household. The IFLS data allow us to identify the individual's relationship to the original IFLS1 household. About 54% of the child sample is composed of biological children of the IFLS1 household head. One check simply involves adding a dummy variable for a child of the household head in our model. This dummy variable is not statistically significant. Another check allows for the possibility that effects of other covariates may be different across children and "nonchildren" groups. We construct a likelihood ratio test analogous to the Chow test for linear models and fail to reject the null

hypothesis that the coefficient vectors are the same for children of the IFLS household vs other individuals in the split sample.

Our second specification check examines the issue of self-selection in migration choice. In the above analysis, we compare transfer patterns for parent households and their children or split-offs. However, we recognize that this sample of individuals who have moved from their origin households and established their own households (child sample) may not be homogeneous. Specifically, our split-off sample is composed of two groups: individuals who have moved outside the village/town where the origin household resides (about 54% of the child sample) and those that have remained within the same village/town as the origin household.[16] A related concern is that children who reside in the same communities as their parents may be subject to common aggregate shocks—and both households may increase their transfers in response to community-level shocks.

To deal with this concern, we introduce an indicator variable (same community = 1) in order to capture whether a child household resides in the same community as the parent household. We find that this dummy variable is statistically insignificant for family transfers for both the split sample and the origin household. We also conduct a likelihood ratio test for parameter differences in family transfers for individuals that no longer reside in the same community as their parent household. An unrestricted model, which allows for different coefficients for individuals that have moved vs those individuals that have remained in the same community as the parent household is compared with the restricted model (which contains the full sample). The likelihood ratio test fails to reject the null hypothesis of no structural change for the two subsets of the child sample. We should note that the dummy variable approach and likelihood ratio test do not provide evidence for a location effect in community giving, in that child households that reside in the same community (as the parent household) do not give larger community transfers, holding other variables constant.

The final specification check examines the role of parental income in child transfer behavior. The econometric framework adopted in Section 4 assumes that parental characteristics affect the child's behavior only through parent's transfer behavior (the role model, or parental effect). This assumption imposes restrictions on the parameter estimation and can be tested against a less restrictive approach. To investigate the validity of our assumption, we include parental household expenditure per capita as an additional regressor in the child's giving equation, which allows us to test whether parental expenditure

[16]For individuals who reside outside the village or town of their origin household, family- and community-level shocks and constraints are less likely to be correlated. Since migration is an endogenous choice, an additional concern is that kids who reside in a different community from their parent household may have different tastes, wealth, unobserved ability, strength of family ties, and other variables that affect transfer behavior. For example, as distance from the parent household increases, the costs of sending family transfers may be higher.

affects child's giving (an "indirect" effect) and if role model effects persist once we have controlled for parental expenditure in the child's transfer equation. Our findings suggest that parental expenditure has a positive but statistically insignificant effect on child's transfers to the family and community. In addition, the inclusion of parental expenditure as an additional regressor in the child's transfer equation does not significantly reduce the point estimates associated with the effect of parental transfer behavior on child's giving. However, the standard errors on the coefficients for parental giving are larger, which decreases the significance level of the role model effect (parental giving remains significantly associated with the child's giving at the 10% level for sibling transfers and at the 5% level for community giving).

## 6 Policy implications of results

The relationship between family and community networks within and across generations, usually discussed under the rubric of "social capital," has gained increasing attention within the social science literature. In developing countries, where publicly provided safety nets tend to be limited in scope, households rely heavily on private transfers. Cox and Jimenez (1990) estimate that private transfers constitute 2% to 20% of income using household data from five developing countries. The results on "role model" effects in transfer behavior suggest that children learn important lessons about participating in both family and community networks within the family. This is an important insight for policy makers in both developing and developed countries that seek to expand the role of community-based organizations.[17]

The second set of results focus on the relationship between family and community networks may also provide some implications for policy makers. Specifically, identifying the relationship between transfer networks can influence the design and implementation of government support for community organizations. One crucial question then is the likely impact of government involvement on family and community networks. For example, if the government provides community organizations with grants, for income redistribution, will these grants displace contributions to both family and community organizations – the "crowding out" hypothesis – and, if so, to what extent? Crowding out effects will largely depend on the relationship between family and community networks. If family networks and community-level networks are close substitutes, then policies that provide funding to community organizations may

[17]For example, in the USA, government policies, including the faith-based and community initiatives since 2001, have promoted the expansion of community organizations. Policymakers in Europe and Canada have also discussed the role of community-based organizations in promoting voluntary and civic behavior.

reduce households' contributions to both networks.[18] In contrast, where family and community networks are more complementary, government grants to community organizations may increase the demand for services from family.[19] In addition, because the results indicate that giving to family and community networks tends to be related across generations, even small displacements in family- and community-level mechanisms for providing income redistribution may have an impact on the willingness of future generations to contribute to family and community networks.

## 7 Conclusion

This paper contributes to existing knowledge on the relationship between family and community networks, both within and across generations. First, we investigate the role of family in shaping transfer choices across generations. The results provide evidence in support of origin household influences or role model effects in family and community giving. Our findings point to the strength and persistence of private transfer networks across generations. In particular, the community transfer decisions of adults living outside their households of origin appear to be positively influenced by the origin household's community giving.

Second, we also examine the relationship between transfers to family and to community networks and investigate empirically whether transfers to family and community networks are substitutes or complements. Results from the IFLS provide significant evidence that unobserved heterogeneity in giving to family members and community organizations is positively correlated for parents and their adult children. This result suggests that important complementarities exist between transfer networks; however, more research is needed to provide a better understanding of relationships between family and community networks across various economic environments. Further research may also be needed to investigate what role governments can play in supporting both family and community-based networks to minimize crowding out of existing private transfer networks.

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[18]This assumes that the substitution effect between family and community networks will dominate the income effect.

[19]However, we should note that it may be challenging to predict the consequences of new government policies towards community institutions based on existing data because changes in government policy towards community institutions will most likely affect household expectations and may, in fact, alter relationships between family and community networks.

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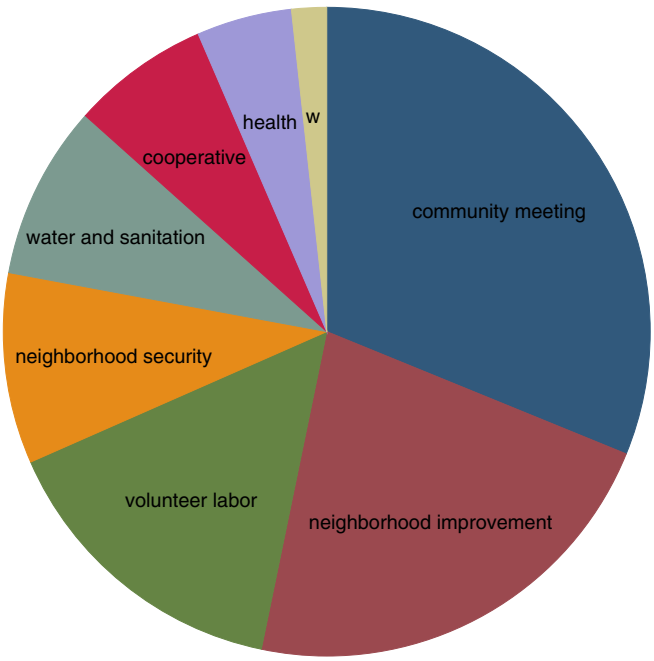
## Appendix A: Contributions to community organizations

Parent households: Origin heads, matched sample, $N^{20} = 158$

Membership distribution[21] : community meeting 31%, neighborhood improvement 22%, volunteer labor 15%, neighborhood security 9.5% water and sanitation 9%, cooperative 7%, community health post (health) 5% women's groups (w) %2.

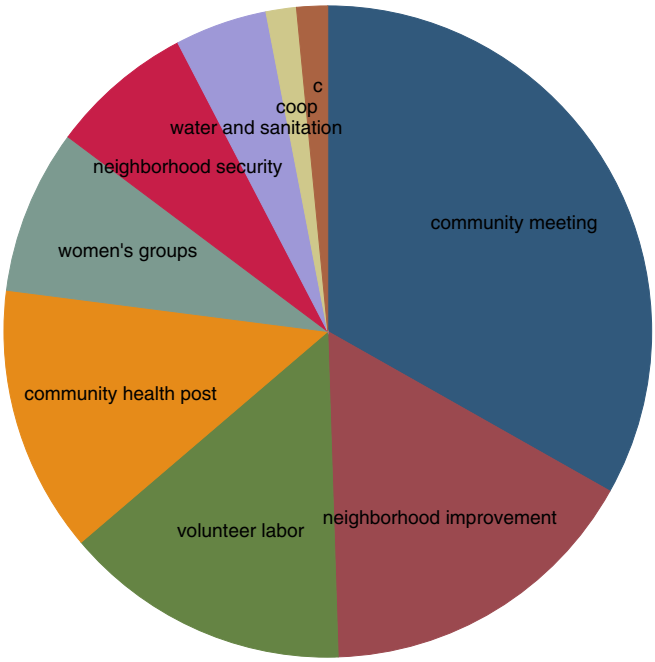



[20] $N$ denotes the number of households that have contributed to a community organization.

[21] We define membership as the decision to contribute monetarily to a community organization. For example, 33% of all households contribute to the community meeting for both parent and kid samples. Note that a household may contribute to more than one community organization.

Kid households: Split sample, $N = 146$

Membership distribution: community meeting 33%, neighborhood improvement 16%, volunteer labor 14%, community health post 13%, women's groups 8%, neighborhood security 7%, water and sanitation 5%, cooperative (coop) 2%, contraceptive groups (c) 2%.




## Appendix B: Relationship to the origin household head in IFLS1

Kid households

| Relationship to the head of the origin household in 1993 | $N = 767$ Percent of the sample |
|---|---|
| Child of origin head | 53.72 |
| Son/daughter-in-law of origin head | 16.04 |
| Sibling | 6.39 |
| Brother or sister-in-law | 5.61 |
| Other relative | 16.81 |
| Non-family | 1.43 |
| Total | 100.00 |

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