Risk, Network Quality, and Family Structure: Child Fostering Decisions in Burkina Faso*

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Abstract

Child fostering, the practice of parents sending their own biological children to live with another family or receiving in a child from a different household, is prevalent throughout sub-Saharan Africa. Given the prevalence of child fostering and the potential welfare implications for children living away from their biological parents, it is critical to understand why a family decides to send or receive children. Using a unique dataset collected by the author during eighteen months of fieldwork in Burkina Faso, this paper attempts to answer this research question. This paper presents a theoretical framework, in which children are efficiently allocated across households in a social network, to motivate three principal factors influencing the household decision to foster a child. A household fosters children as a risk-coping mechanism in response to exogenous income shocks, if it has a better quality social network, and to satisfy labor demands within the household. Empirical evaluation of these three covariates finds that they significantly influence the household decision to send a child, but not the decision to receive a child. Increases of one standard deviation in a household's shock, percentage of good network members, or number of older girls, would increase the probability of sending a child above the current level of fostering by twenty-eight, twenty, and thirty-four percent, respectively. Testing an implication of the theoretical model that the factors influencing the sending decision should have an opposite effect on the receiving decision leads me to reject the Pareto efficient model.

1 Introduction

In sub-Saharan Africa, child fostering is a prevalent and socially accepted institution where parents send their own biological children to live with a different family or take in a child from another family. Based on household survey data I collected in rural Burkina Faso, approximately twenty-seven percent of households either sent or received a foster child between 1998 and 2000.[1] Almost ten percent of all children aged five to fifteen inclusive were sent to live away from their biological parents during this time period, and these children spent, on average, two years and nine months living away from their parents.[2] Living away from their parents might put these children at risk of reduced educational attainment or worse health outcomes, which would further impair Africa's economic growth and limit its ability to achieve sustainable development. Most international development organizations and academic research claim that these outcomes are widespread and that child fostering is detrimental to children's welfare (Kielland, 1999; UNICEF, 1999; Case, Lin, McLanahan, 2000; Case, Paxson, Ableidinger, 2002; Bishai and Suliman, 2003). However, several researchers argue there is considerable heterogeneity in the schooling and health outcomes of foster children that varies across countries, wealth classes, and reasons for the child being sent (Castle, 1995; Lloyd and Blanc, 1996; Ainsworth and Filmer, 2002).[3]

Prior to measuring these welfare impacts, it is crucial to first understand why a family adjusts the structure of its household by fostering children. This paper examines why families send and receive children using a unique dataset I collected during eighteen months of fieldwork in Burkina Faso. The survey instrument and the research methodology that involved locating the sending and receiving households participating in each fostering exchange make these data particularly appropriate for answering this question.

I present a theoretical framework that provides the motivation for three principal factors influencing the household decision to foster a child. First, households use child fostering as a risk-coping mechanism in response to exogenous income shocks. Households that experience worse shocks are

[1] A breakdown of these households shows that sixteen percent of all households sent a child and fourteen percent received a child, with three percent both sending and receiving.

[2] These foster rates are consistent with other Burkina Faso data sources that use slightly different children's age ranges and are not for the same three year period. Burkina Faso Demographic and Health Survey data from 1993 show that, in the rural areas, fourteen percent of children aged five to fourteen were fostered, or approximately 500,000 children (Dabire, 1998). A 2002 World Bank survey of 4500 randomly sampled rural households in Burkina Faso shows that ten percent of children age six to seventeen were living away from their parents (Kielland and Sanogo, 2002).

[3] A related paper, using the data I collected, tries to measure these welfare impacts by comparing outcomes of foster children to both their foster siblings and their biological siblings.

more likely to send a child, while households that experience less severe shocks are more likely to receive a child. Second, households with better opportunities, measured in terms of the quality of their social network, are more likely to foster. Third, in these households, children perform chores that might include cooking, cleaning, childcare, fetching wood, and running errands. Having too many or too few children in a given gender and age class may not optimize household production, and therefore, parents are more likely to foster children to offset these demographic imbalances.

The data provide empirical evidence that these three factors significantly affect the household's decision to send a child, but not the decision to receive a child. A household is significantly more likely to send out a child if it experiences a negative shock, has a better quality social network, or has additional children in a given age and gender class. However, none of these variables seem to explain a household's receiving decision. The only variable that is consistently significant is the receiving household's wealth, with richer households more likely to receive a child. One implication of the theoretical framework is that factors influencing the sending decision should have an opposite effect on the receiving decision. Based on the empirical evidence, I reject this theoretical model for child fostering.[4]

This paper contributes to three distinct literatures: child fostering, risk-sharing, and social networks. The paper extends the child fostering literature by empirically verifying two new explanations, risk-coping and network quality, for why households foster children. The paper also builds on Ainsworth's (1990, 1996) seminal work on child fostering by confirming her results that child labor plays a role in household fostering decisions. Using data from the 1985 Côte d'Ivoire Living Standards Survey, Ainsworth examines two possible economic explanations for child fostering . First, her empirical findings support the hypothesis that children are fostered for child labor reasons. Anthropologists, demographers, and sociologists working in West Africa also find evidence that households foster children for labor reasons (Schildkrout, 1973; Goody, 1982; Oppong and Bleek, 1982; Isiugo-Abanihe, 1985; Bledsoe and Isiugo-Abanihe, 1989; Fagnon, Sinzogan, Souza-Ayari, 1994; Ayeboa and Tingbe-Azalou, 1997).

The second explanation Ainsworth tests is whether households send out children for educational investment when local opportunities are limited. Although her empirical findings are inconclusive,

[4]Empirical evidence indicates that households that receive children have access to better quality networks compared to households that neither send nor receive. This contradicts the theoretical model, which implies that sending households should have a better network quality than non-fostering households and non-fostering households should have a better network quality than the receiving households. Incorporating this information and developing a richer model is outside the scope of this paper.

several sociologists and demographers provide evidence supporting the educational investment hypothesis (Goody, 1982; Chernichovsky, 1985; Gould, 1985; Isiugo-Abanihe, 1985; Page, 1989). Subsequently, an economist using World Bank Living Standards Measurement Survey data from South Africa showed that educational investment can explain some instances of fostering (Zimmerman, 1999).

Using the data I collected, I do not find evidence that educational investment explains child fostering in Burkina Faso. First, households cited the reason each child was fostered, and only nine percent listed schooling. Given that schooling is perceived by the respondents as a positive reason for fostering as compared to child labor reasons, nine percent is likely to be an upper bound for the number of children actually fostered for schooling. Second, the primary school enrollment rate for children in these households is only twenty-six percent.[5] Analyzing this rate by fostering status shows that twenty-seven percent of non-fostered children are enrolled in school compared to twenty-three percent of foster children. Although the enrollment rate is lower for foster children, a two-tailed t-test indicates I cannot reject they are equal with a corresponding p-value of 0.23. This is evidence that foster children are no more likely to be enrolled than non-fostered children.

This article extends the risk-coping literature by providing evidence for another mechanism that households adopt to deal with adverse shocks and income fluctuations. Researchers have documented that, in risky environments, households may use various methods to cope with exogenous shocks such as informal credit markets (Udry, 1994), migration and marriage strategies (Rosenzweig and Stark, 1989; Paulson, 2000), livestock sales (Rosenzweig and Wolpin, 1993; Fafchamps, Udry and Czukas, 1998), and gifts and transfers from relatives and neighbors (Goldstein, 2000; Fafchamps and Lund, 2001). None of the existing empirical economics research has tested whether households use child fostering as a risk-coping strategy.[6] One economist developed a theoretical model showing that risk might motivate households to foster children but was unable to empirically test it (Serra, 1996). Outside of economics, there is research indicating that households foster children in response to shocks. Sociologists and demographers provide evidence that households use fostering to deal with uncertainty and risk (Brydon, 1979; Etienne, 1979; Goody, 1982; Bledsoe and Isiugo-Abanihe, 1989). Other researchers argue fostering is used to reduce household expenses,

[5]This rate is defined as the number of children age eight to fourteen enrolled in primary school, divided by the total population of that age group. These enrollment rates are consistent with World Bank (2000) and Burkina Faso Demographic and Health Surveys (1993) that show Burkina Faso school enrollment to be one of the world's lowest.

[6]This paper does not try to explain or understand other mechanisms besides child fostering that a household might use to cope with risk. A related paper attempts to measure a household's dynamic response to negative shocks.

particularly for those households that have limited resources and are therefore more vulnerable (Piche and Poirier, 1990; Locoh, 1997).

The third literature this paper contributes to is that of social networks. The analysis shows that social networks, in particular their quality, influence the household's decision to foster a child. Previous research considered the role social networks play in outcomes such as workers locating jobs (Granovetter, 1973; Montgomery, 1991; Munshi, 2003) and the decision to migrate (Massey, Alarcon, Durand, and Gonzalez, 1987). Further work by Espinosa and Massey (1997) attempted to quantitatively measure a respondent's network quality and its impact on a migration decision. This paper extends the previous social network research in two ways. The first is by considering the importance of social networks for a new outcome, child fostering, and the second is by contributing two new quantitative measures of network quality.

The rest of this paper is organized in the following way. Section 2 describes the theoretical framework that motivates the household fostering decision. In Section 3, I describe the empirical setting where I collected the data. Section 4 presents the empirical results for the household sending and receiving decision and tests an implication of the theoretical model. Section 5 concludes.

2 Theoretical Motivation for the Child Fostering Decision

To clarify the household decision to send or receive children, I present a simple theoretical framework that describes the efficient allocation of children across households in a social network. The framework provides motivation for risk-coping, child labor, and social network quality as three principal reasons why households foster children. The key assumption of the model is that foster children and biological children (in a given age and gender class) are perfect substitutes in production and utility. This assumption implies that factors influencing the sending decision should influence the receiving decision in an equal and opposite way. The empirical evidence rejects this implication, indicating the need for a richer model of household decision making that incorporates altruism and treats foster children differently than biological children.

To illustrate this framework, I examine a social network made up of N households indexed by i where $i = 1, ..., N$. I let s index the S states of nature, with each state having an objective and known probability of occurrence, π_s. For household i, $\mathbf{K}_i$ is a vector representing the number of household i's resident children and measures the different age and gender classes of these children. The variable $\mathbf{F}_{is}$ is a vector representing the net number of foster children received in each age and

gender class for household i if state s occurs. In the model, the number of foster children is defined on the set of real numbers and is not limited to integer values.[7]

Consumption for household i in state s, C_{is}, is determined by its output in state s, $C_{is} = G_{is}(\mathbf{K}_i + \mathbf{F}_{is})$. In the survey region, there are no land or adult labor markets and so these factors, which can be heterogeneous across households, are incorporated into the production function, G_{is}. The production function also incorporates other characteristics of the household that influence output, such as occupation and marital status. Capital is not considered in the model since almost no households in the survey area use capital inputs such as animal traction. Net fostering for household i determines its amount of available child labor and household i's production, $G_{is}(\mathbf{K}_i + \mathbf{F}_{is})$, is increasing and concave in child labor, $G'_{is}() > 0$, $G''_{is}() < 0$.

For household i, I define utility, U_i, to be a function of resident children's per capita consumption, $\frac{C_{is}}{(\mathbf{K}_i + \mathbf{F}_{is})}$. The utility function is twice continuously differentiable with $U'() > 0, U''() < 0$. The timing in the model is such that households in the social network initially pick a vector of potential fostering decisions, the state of nature is observed, the household completes the fostering exchange that it initially committed to, then production and consumption outcomes are realized.[8]

Any Pareto efficient allocation of children within the social network can be characterized by maximizing the weighted sum of expected utilities for each of the N households for some choice of Pareto weights for each household i, λ_i, with $0 < \lambda_i < 1$ and $\sum_i^N \lambda_i = 1$:

$$\underset{\{\mathbf{F}_{is}\}}{Max} \sum_{i=1}^{N} \lambda_i \sum_{s=1}^{S} \pi_s U_i \left(\frac{C_{is}}{(\mathbf{K}_i + \mathbf{F}_{is})} \right) \tag{1}$$

subject to the production constraint for each household in each state of nature and the condition that net fostering across households in the social network is zero:

$$C_{is} = G_{is}(\mathbf{K}_i + \mathbf{F}_{is}) \quad \forall i, s \tag{2}$$

$$\sum_{i=1}^{N} \mathbf{F}_{is} = 0 \tag{3}$$

In this model, results are symmetric for sending and receiving households because only net fostering

[7] Imposing an integer constraint on the number of foster children qualitatively yields the same results regarding the Pareto efficient allocation of children in the network, except there would be a wedge driven between optimal fostering and actual fostering.

[8] In this theoretical framework, I assume a unitary household model in which there is no intra-household bargaining with respect to the fostering decision. A related paper explores the verity of this assumption.

enters the maximization problem and the sum of net fostering across all households in the social network must be zero.

To illustrate the different motivations for fostering children, I examine two extreme sub-cases of the above problem. In the first case, I focus exclusively on the labor productivity explanation and assume there is no fostering for risk-coping reasons. I assume there are perfect insurance markets, so households have complete insurance. Even with perfect insurance markets, households will foster children to equate the marginal product of child labor across households in the network. Because of the symmetry result previously mentioned, if a household with a low marginal productivity of child labor sends a child, there must be a household with a higher marginal productivity of child labor that receives the child. For a given production function, a family with many children of a given age and gender will have a lower marginal productivity of child labor than a family with few children.

In the second case, households foster children only for risk-coping but not labor productivity reasons. I eliminate the labor productivity explanation by making household production no longer depend on child labor. There are no insurance or financial markets, but fostering can serve as an insurance substitute. Even without productivity differentials, households in a network will try to equalize the marginal utility of consumption across states by fostering children. If a household experiences low consumption, it will send out a child to a household in the social network experiencing high consumption.

These sub-cases highlight two factors, labor productivity and risk-coping, that influence household i's fostering decision in the social network. If household i has low productivity or low consumption, it is more likely to send a child. However, because of the symmetry result, the other households in the social network also play a role in household i's decision. A transitory factor such as labor productivity or risk-coping that influences household j in the network to receive a child will influence household i's sending decision. If household j has high productivity or high consumption and is more likely to receive a child, then household i will be more likely to send a child. In addition to transitory factors about the other households in the network, permanent characteristics of the other network members can also influence the fostering decision for household i. If household j in the network has a good occupation or a stable marital situation and is therefore more likely to receive a child, this makes household i more likely to send a child. These permanent and transitory characteristics of the other households in the social network constitute the network's quality and

measure the fostering opportunities available to households in that network.

In summary, the framework provides a foundation for understanding how risk, labor productivity, and network quality influence the household fostering decision and for understanding why these factors have an opposite effect for the sending and receiving households.

3 Empirical Setting

Understanding why households foster children requires detailed information on social networks, household risk-coping mechanisms, and foster children's placement. Because existing data from Africa were not adequate to answer this question, I spent eighteen months in Burkina Faso conducting household surveys to gather the necessary information.[9] Burkina Faso was selected for this study for two reasons. First, it is thought to be a major supplier of foster children, many of whom are sent to Côte d'Ivoire (International Labor Organization, 2001). Further evidence is provided by a front page New York Times article that highlighted child trafficking between these two countries for cocoa production (Onishi, 2001). Therefore, understanding the household decision to foster children has important policy implications for the region. Second, institutional collaboration with Unité d'Enseignement et de Recherche en Démographie in Burkina Faso's capital, Ouagadougou, provided additional support to the data collection process including access to village maps and detailed ethnographic information about the villages.

The fieldwork component of the project improved on previous economic studies in several ways. First, I developed a methodology that involved locating and interviewing the sending and receiving households of each fostering exchange. For example, if a household interviewed in the random sample had sent a child to another family, then in the tracking phase of the survey, the receiving household was located and interviewed. Similarly, if a household interviewed in the random sample had received a child, then the biological parents of the child (sending household) were located and interviewed. This methodology enabled me to collect information from both households involved in a given fostering exchange and better understand the factors influencing that decision, as well as the welfare implications for the children involved. Second, I began the project with an extensive qualitative component in which I conducted focus group discussions as well as semi-structured, individual interviews to help me develop and informally test different hypotheses that might explain

[9] More detailed information about the fieldwork, including the survey instruments, field enumerator training manuals, and project reports can be found on the website: http://www.econ.yale.edu/~rsa7.

child fostering.

Phase 1 of the survey consisted of randomly selecting fifteen rural villages in Bazega province located approximately fifty miles from Ouagadougou. In these villages, the unit of analysis for the sampling frame was the compound.[10] Within each compound, an enumerator individually interviewed the head of every household and then separately interviewed all of his wives, if applicable.[11] Based on these data, households in this region consist predominantly of subsistence farmers growing millet, sorghum, and groundnuts and have an average annual income of $183. On average, these households have 10.6 members consisting of a household head, 1.5 wives, 3.6 children under age 18, 3.2 children over age 18, and 1.3 members that might include the respondent's mother, brothers, sisters, grandchildren, distant relatives, and individuals with no direct relationship. Additional summary statistics from this dataset are recorded in Appendix Table 1.

Phase 2 of the survey consisted of finding the paired households that had exchanged a foster child and interviewing the head of each household along with all of his wives using the same survey instrument from Phase 1. I restricted this tracking to those households that had exchanged a foster child between 1998 and 2000 and where the child's age at the time of fostering was between five and fifteen inclusive. Children aged zero to four were excluded from the tracking for two reasons. First, other researchers studying child fostering in Africa have argued that the reasons for sending young children are different than for older children (Lallemand, 1976; Vandermeersch, 2002). In particular, children under age five are not routinely performing domestic chores and are essentially just consumers. Around age five, children are expected to become economically helpful to the family, undertaking tasks in the household, in the fields, and in the market place. At this time,

[10]To increase the number of households in the sample that had fostered children, I adopted a two part sampling frame that included a random sample and a choice-based sample. The choice-based sample consisted of compounds that had fostered a child between 1998 and 2000. All results in this paper use the entire combined sample, but results are quantitatively similar and robust when I restrict the observations to just the random sample. Using the population fostering weights from the village level census to adjust the choice-based sample does not significantly alter the results. A total of 383 compounds containing 606 households were selected with approximately sixty percent of the compounds in the random sample.

[11]Enumerators followed these guidelines to assign every individual living in the compound to a specific household. The head of the compound and his wives constituted the first household. Any other individual, not yet assigned to a household, that was still married as of December 31, 2000 would constitute an additional household with his wives. Any other remaining individual, not yet assigned to a household, who had once been married and whose marital status (widowed, divorced, separated) changed between 1998 and 2000 would constitute an additional household. Other remaining, unassigned individuals in the compound, who had once been married and whose marital status changed before January 1, 1998 and who do not depend on the head of the compound or another household head in the compound would constitute an additional household. Finally, any remaining individuals, not yet accounted for, who have never been married and who do not depend on the head of the compound or another household head in the compound would constitute an additional household. This household definition was implemented to ensure that individuals in the compound who might have been involved in making a fostering decision would be interviewed.

households would become concerned with offsetting demographic imbalances in the number of their children of a given age and gender. Second, results from this survey confirm that fostering of young children is much less common than older children, showing a significant jump in fostering rates at age six. Approximately one percent of children under age five were fostered during the years 1998 to 2000, compared to almost ten percent of children aged five to fifteen.

Children aged sixteen and older were also excluded from the tracking because, at that age, most villagers in rural Burkina Faso would consider them adults. They are physically mature, have passed initiation rites, and females are of an acceptable age for marriage. In addition, for older children, it becomes difficult to disentangle what is child fostering and what is an example of households splitting off members to form distinct and separate households.

For the tracking phase, approximately sixty percent of the paired households were located within a twenty-five mile radius of the Phase 1 villages, twenty-five percent were located in the capital fifty miles away, nine percent were in Côte d'Ivoire approximately eight hundred miles away, and six percent were scattered across the other provinces of Burkina Faso. There were 316 paired households to be found during the tracking phase, and the field enumerators and I located 94.9 percent of them, 300 households in total.[12]

To test the hypothesis that network quality influences the household decision to foster a child, I collected detailed information about the other households in its social network that could be involved in sending or receiving a child. Any household is a potential receiver or sender, but for two reasons, I limited these questions to immediate family members (parents, brothers, sisters, and adult children) that are not co-resident, instead of all network members. First, based on the qualitative interviews I conducted prior to the survey, a large proportion of child fostering occurs between immediate family members. After the survey data were collected, it turned out that sixty-two percent of all foster children in the sample were sent to or received from immediate family members. Second, during the pre-testing of the survey instrument, respondents were unable to consistently answer questions about network member's characteristics, such as their occupation,

[12]The sixteen tracked households that were not interviewed included four households (three in the capital and one in Côte d'Ivoire) that were found but refused to be surveyed, four households in the capital in which the child left the village in search of work and had not yet contacted his biological parents to indicate the family with whom he was now living, two households where the parents left children in the village in Burkina Faso and went to work in Côte d'Ivoire but the receiving household did not have information to locate them, and three households (two in Côte d'Ivoire and one in Togo) that had contacted the parents to inform them they were moving towns and would send more contact information once they were settled. Finally, the remaining three cases included issues of disputed paternity, alleged adultery, and confirmed sorcery.

marital status, education, the number of their children currently enrolled in school, relationship to the respondent, and their household demographics, if the questions pertained to individuals other than immediate family members. An additional benefit of restricting the network space to only immediate family members is that I reduce any potential endogeneity problems related to the fact that a household's decision to foster might be correlated with its decision of which households are in its network. With this definition of network members, the sending household takes as exogenously given its network's size and quality.

To understand how a household reacts to changes in its economic environment, which is inherently a dynamic process, I asked retrospective questions covering the three years, 1998 to 2000, prior to the survey interview. In addition to questions about network members, the data contain information about agricultural production for every crop the household grew between 1998 and 2000. There is also information about each biological child in the respondent's household and, if the child was ever sent out, questions are asked determining the relationship between the sending and receiving households, the timing of the fostering, and the receiving household's location.

4 Empirical Results

Based on the theoretical framework discussed earlier, the goal of the empirical section is to test the role of risk, network quality, and family structure in a household's decision to foster a child in a given year. In Section 4.1, I examine the household's decision to send a child, and I find that a household is more likely to send a child if it experiences a worse income shock, has a better quality network, or has additional children in a given age and gender class. In Section 4.2, I examine the household receiving decision. I do not find that the receiving decision is influenced by risk, network quality, or family structure measures. In Section 4.3, I test an implication of the theoretical framework that the factors influencing the sending decision have an opposite effect on the receiving decision. I am able to reject the theoretical model, which indicates the allocation of children across households in a social network is not Pareto efficient.

4.1 Household Sending Decision

To analyze the household sending decision, I first need to determine how to measure network quality. I begin by examining, for a household that sent a child to a network member, why it selected that particular member. I estimate a binary logit and a household fixed effects logit model

of the probability a given network member is selected to receive a child. Both models include as explanatory variables the network member's characteristics and the joint characteristics about the potential match between the network member and the foster child. Results show that a network member who has a good occupation, is in a stable, long-term marriage, or is the parent or child of the sending household, is more likely to be selected to receive the foster child.

Using this information, I calculate two alternative network quality measures for every household in the sample (including households that did not foster children). The first is an ad hoc, intuitive measure that captures two dimensions of the network's quality that impacts the fostering decision, occupational status and relationship to the respondent. In the second measure, I use the estimated coefficients from the household fixed effects logit regression to calculate for every network member a predicted value, $X\widehat{\beta}_{FELogit}$, that the network member would be selected to receive a foster child, if a child were sent. I measure the household's network quality as the percentage of the household's network members whose predicted value of being selected lies above some threshold level.

Finally, I estimate the household decision to send a child in a given year as a function of household level agricultural shocks, network quality, and variables measuring the household's demographic characteristics. The empirical results are consistent with the theoretical framework. Households that experience a worse agricultural shock in a given year, have a better quality network of potential receivers, or have household level demographic imbalances in the age and gender composition of their children are more likely to send out a child.[13]

4.1.1 Preliminary Evidence About Selection of a Network Member

To analyze why a particular network member is selected to receive a foster child, I restrict the data to only those households that sent children to immediate family members between 1998 and 2000. I make this restriction because in the analysis, I use information about network members who potentially could have been selected to receive a foster child but were not. Each immediate

[13]In using this two-step procedure in which I first estimate the selection of a network member and then the sending decision, I assume there is no correlation between the network member selection and the additional option of not sending a child. Intuitively, this assumption implies the following. For example, a household selects its oldest brother to receive its child, conditional on sending. If this household had the additional option to not send a child, but it still chooses to send a child, it will select the same oldest brother. If this assumption is violated, I could estimate an alternative one-step procedure in which I jointly estimate the selection of a network member and the sending decision. If the assumption is not violated, both the two-step and one-step procedures will yield similar results. However, because the data do not measure shocks for each network member, a joint estimation procedure has to make additional assumptions about these shocks. An additional advantage of the two-step procedure is that it provides a summary measure of network quality for each household that I use in other related work.

family member linked with a sending household is an observation in the restricted dataset, totaling 2364 observations.[14] Appendix Table 2 contains summary statistics for some of the variables used in the network member selection regression.[15]

Analyzing descriptive statistics about network members' occupation and relationship to the sender provides preliminary evidence about which factors influence this selection decision. Table 1 shows that, while only 8.6 percent of the immediate family members who did not receive a foster child are parents of the respondent, parents constitute 31.9 percent of the immediate family members selected to receive foster children. Brothers and sisters are less likely to be selected to receive foster children. The likelihood ratio test that the relationship categories are significantly different yields a $\chi^2(3)$ test statistic of 87.7 and a corresponding p-value of zero.

Table 2 indicates that for immediate family members who did not receive foster children, only 8.1 percent of them are in business, whereas 12.5 percent of those who did receive a foster child are business people. Network members who are retired, unemployed, or housewives are less likely to be selected to receive foster children. The likelihood ratio test that the occupation categories are significantly different yields a $\chi^2(6)$ test statistic of 10.2 and a corresponding p-value of 0.12.

4.1.2 Logit specification for estimating network member selection

I estimate the network member selection regression using binary logit and household fixed effects logit models. For the binary logit regression, I estimate the following equation, $Prob(Selected_{cm} = 1|X_{cm}) = \frac{exp(\beta_0+X_{cm}\beta)}{[1+exp(\beta_0+X_{cm}\beta)]}$, where $Selected_{cm}$ is defined as a dichotomous 0,1 variable with the value 1 indicating that the individual network member m was selected to receive the foster child c, and the explanatory variables, X_{cm}, for network member m relating to foster child c are described below. This regression estimates the probability that an individual network member was selected to receive a foster child as a function of the individual's personal characteristics and the joint characteristics of the potential match from sending a child to that network member. In this restricted sample, 6.8 percent of network members were selected to receive a foster child. The personal characteristics of the network member include occupation, relationship to the sending household, marital status, whether the network member attended school, whether the network member has children currently

[14] I include in the sample all sending households identified in Phase 1, and the sending households from Phase 2, which were identified via their link with Phase 1 receivers.

[15] Immediate family data include information on the respondent's mother and father. For this analysis, to prevent double counting a household, I omit the mother's observation if the father is alive and the parents are co-resident.

enrolled in school, whether the network member's household had a birth between 1998 and 2000, and variables measuring the age and gender distribution of the network member's children. Variables measuring the uniqueness of the match between two potential foster households include age and gender indicators for the child sent and interactions of age and gender dummies for the child sent with age and gender dummies for the network member's children.

Logit regression results in Table 3, column 1 show that a network member's characteristics and the complementarity of the match between the two potential exchanging households affect the probability that network member is selected to receive a foster child. The regression provides preliminary evidence that the sending household is attempting to find the best receiving household for their child. If the network member has a good occupation, such as a business person or a bureaucrat, the member is more likely to be selected. However, if the network member is a housewife, retired or unemployed, then the member is less likely to receive a child. Calculating the marginal change in the probability of being selected due to an incremental change in the independent variable from its mean shows that network members are 4.1 percent more likely to be selected if their occupation is business and 5.7 percent less likely to be selected if they are retired or unemployed.[16]

In addition, if the network member is either the respondent's parent or adult child, then that member is more likely to receive a child compared to the respondent's sisters or brothers. The sender's parents are 8.4 percent more likely to receive a child, while the sender's adult children are 4.3 percent more likely. If the network member is recently married, widowed, divorced, or has never been married, the individual is less likely to be selected compared to someone married for more than three years. Network members that have never been married are 6.6 percent less likely to receive a foster child, while those who are widowed or divorced are 4.9 percent less likely. These results indicate that the receiving household is more likely to be someone with a good occupation, in a stable marital union, and with close blood ties to the respondent.

Educational investment is often cited as a reason for sending a child and households might select their most educated network member to receive their child because that member is more likely to realize the importance of education and keep the foster child in school. Similarly, the sending household might select a network member living near a primary school to ensure their own child's schooling. However, while the coefficient is positive for the variable indicating whether the

[16]The marginal effect for an incremental change in an independent variable, x_i, evaluated at the mean of the variable, in the logit specification is calculated as: $\frac{\partial P(x)}{\partial x_i} = \frac{exp(\widehat{\beta_0^{logit}} + \overline{X_{cm}}\widehat{\beta^{logit}})}{[1+exp(\widehat{\beta_0^{logit}} + \overline{X_{cm}}\widehat{\beta^{logit}})]^2}\widehat{\beta^{logit}}$

network member attended school, it is not statistically different from zero. The variable indicating if the network member's own children are currently enrolled in school is also not significant.

Sociologists argue that having no children, a limited number of children, or too few children of a particular gender are situations where households might receive a child to make up for these shortcomings (Lallemand, 1980; Jonckers, 1997). Regression results provide limited evidence that the network member's demographics influence the receiving decision. Network members with boys aged zero to five are significantly less likely to be selected to receive a child. The coefficients for the variables indicating if the network member recently had an infant are negative but are not significantly different from zero.

Results for the demographic interaction variables suggest sending households are more likely to choose network members with children of a different age and gender than the child being sent. First, this implies the coefficients on the age and gender interaction terms should be positive if the potential receiving household has a child whose age or gender differs from the child sent, and second the coefficient on the interaction term should be negative if the potential receiving household has a child with the same age and gender as the child sent. Since the number of households that are selected and take the value of one for a given interaction variable is small, the regression does not have sufficient power to identify these interaction coefficients. Therefore, the coefficients qualitatively support the above description, but in few cases are the coefficients statistically significant.

4.1.3 Household fixed effects logit for estimating network member selection

It is likely there are certain unobserved factors unique to a sending household and its social network. This unobserved household heterogeneity might include any factors about the child, besides the child's age and gender that are already controlled for, that influence the likelihood a potential network member is selected. Possible factors might include the personality of the child, whether the child is hard-working, or the child's ability to do certain tasks. I deal with this unobserved heterogeneity by estimating the following network member selection regression using a household fixed effects logit specification, $Prob(Selected_{cm} = 1|X_{cm}) = \frac{exp(\alpha_c + X_{cm}\beta)}{[1+exp(\alpha_c + X_{cm}\beta)]}$, where the dependent and independent variables are as defined previously and α_c represents the fixed effects for foster child c in a given household. Let the subscript for the foster child $c = 1, 2, ..., n$ denote the groups and the subscript for the network member $m = 1, 2, ..., M_c$ the observations for the i^{th}

group. Chamberlain (1980) proposes a way to estimate this model by maximizing the conditional likelihood function, abbreviating $Selected_{cm}$ as Y_{cm}:

$$L^c = \prod_{c=1}^{n} Prob(Y_{c1} = y_{c1}, Y_{c2} = y_{c2}, ..., Y_{cM_c} = y_{cM_c} | \sum_{m=1}^{M_c} y_{cm}) \quad (4)$$

The results from the household fixed effects logit are presented in Table 3, column 2. Coefficient estimates and standard errors are similar to the logit regression results. Network members who have a good occupation, closer blood ties with the sending household, and a long-term, stable marital situation are still more likely to be selected to receive the foster child. Network members who attended school are more likely to receive a foster child, but similar to the logit specification, the coefficient is not statistically significant. Coefficient estimates for the variables measuring the network member's demographics and if the network member had an infant between 1998 and 2000 are similar in both specifications. Analogous results are seen for the coefficients on the terms interacting a network member's demographics with the age and gender of the foster child.

Despite the coefficient estimates and standard errors being similar, I can test whether there is unobserved heterogeneity in the model using a likelihood ratio test to compare the two specifications. Under the null hypothesis of homogeneity, Chamberlain's conditional fixed effects logit and the unconditional logit are consistent, but the fixed effects logit is inefficient. Under the alternative hypothesis of unobserved heterogeneity, the unconditional logit is inconsistent, but the fixed effects logit is consistent and efficient. I calculate the likelihood ratio test statistic as $2(L_{FELogit} - L_{Logit})$ where $L_{FELogit}$ is the log likelihood for the fixed effects logit model and L_{Logit} is the log likelihood for the logit specification. The test statistic equals 307.7 and is distributed $\chi^2(44)$ with a critical value at the five percent level equal to 60.48. Since the fixed effects logit provides a better fit to the data and I can reject the null hypothesis of homogeneity, I use that model in the following network quality analysis.

4.1.4 Measuring network quality

Using the information about which characteristics influence the selection of a particular network member to receive a foster child, I calculate two alternative network quality measures for every household in the sample. The first measure is based on the cross tabulations presented in Tables 1 and 2, and it attempts to capture two dimensions of the network, occupation and relationship to the

respondent, which seem to influence the receiving decision.[17] Households with network members who are business people and members who are either parents or adult children would be considered to have a good network. The intuition is that if the household has network members who satisfy each dimension's criteria (business person for occupation and parent or adult child for relationship), then that household has more choices of people with characteristics favorable for receiving a child. Table 4 shows that fifty-four percent of households have a good network measured this way. While this network quality measure is intuitive and draws on the cross tabulations presented earlier, it ignores other dimensions about the network's quality, particularly the other variables in the network member selection regression in Table 3.

The second network quality measure incorporates these other dimensions, in addition to building on recent sociology research by incorporating the quantity and quality dimensions of a social network (Espinosa and Massey, 1997). For every household in the sample, I link each eligible child aged five to fifteen, with that household's immediate family network members. I then use the estimated coefficients from the household fixed effects logit regression to calculate a predicted value, $X\widehat{\beta}_{FELogit}$, for every network member. This is the predicted value that the network member would be selected to receive a foster child, if a child were sent, and is based on that member's characteristics and the joint characteristics of the potential match between the member and the foster child. Given this is an out-of-sample prediction, in most cases the child was never sent to any network member, and this exercise is only estimating a predicted value that the network member would be selected had the child been sent.[18]

The second network quality measure is based on the idea that, for a fostering exchange to occur, the sending household only needs one household to receive the child. Therefore, I calculate a measure describing the right tail of the distribution of predicted values. Intuitively, if the sending household has a larger share of network members with high predicted values, then it is more likely to find a household in its network that can receive a child.

This second measure is calculated as the percentage of the household's network members who have a predicted value of being selected that lies above the 80th percentile for the entire sample.

[17] Alternative network quality measures that capture other dimensions, such as marital status and education, were tested and yielded similar results.

[18] The second network quality measure uses the estimated coefficients from a regression that only includes those households that sent a child, and is based on the assumption that any unobservables, such as shocks, that might influence whether a household sent a child are uncorrelated with the observables that are used to calculate the predicted probabilities.

I use this percentile because, in the household level fixed effects logit described above, the average percentile for those network members who were selected is the seventy-ninth percentile.[19] In calculating this percentage of network members above the 80th percentile, several intermediate steps were needed. Each network member has a predicted value of being selected to receive a given child from the potential sending household, and if the household has several children, the network member will have a predicted value for each child. For a particular network member, it is possible that the predicted values related to some children are above the 80th percentile while others are below. I consider a network member good if the member has a predicted value above the threshold for any child in the potential sending household.[20] On average, households have thirteen network members, and 29.2 percent of the household's network members are good quality.

Table 5 presents the percentage of households that either sent or did not send a child in a given year broken down by whether their network quality measure is above or below the median. The median percentage of network members above the 80th percentile is twenty-six percent. Households with a network quality measure above the median constitute only 48.1 percent of households that did not send a child in a given year, but 65.0 percent of households that did send a child. Testing whether these are statistically different yields a likelihood ratio $\chi^2(1)$ test statistic of 4.1 with a corresponding p-value equal to 0.04. Households that have a high quality network are more likely to send a child compared to households with a low quality network.

4.1.5 Estimating the Probability of Sending a Child in a Given Year

Based on the theoretical framework, I examine three distinct sets of covariates that influence the household decision to send a child in a given year. The first set of covariates are the two network quality measures developed in the preceding section, and in the household sending regressions, I separately include each of these network quality measures.

The second set of covariates builds on hypotheses discussed in the sociological, demographic and economic literature that economic crises affect the household's decision to send a child (Piche and Poirier, 1990; Serra, 1996; Locoh, 1997). Because the respondents surveyed are rural, subsistence

[19]Results are qualitatively similar and robust when using other percentiles as the threshold level, including the 65th, 70th, 75th, 85th, 90th, and 95th percentiles.

[20]Similar results are obtained using an alternative intermediate step where each network member is no longer considered either good or not. In this alternative, a network member is considered good with respect to a given child and this measure is averaged across children. For example, if a network member is a good match for one out of four children in the household, he would be assigned the value of 0.25. Likewise, if the network member was a good match for all four children in the household, he would be assigned the value of one.

farmers, their economic environment and relevant crises are best captured by measures of their agricultural shocks. To calculate a household measure of agricultural shocks, I use the response to the question, "For each crop grown in a given year, how much of that crop was lost due to an unexpected agricultural shock?" To help the respondent answer the question, the enumerators were trained to provide examples of unexpected agricultural shocks such as animals running through the respondent's fields, pests, rodents, or fungi destroying crops, or unexpected weather damage. The answers were coded from zero (no loss) to three (a large loss). In the regressions, the household's agricultural shock variable, for each of the three years, is calculated as the average of the shocks for every crop grown by that household in that year.[21] The average household shock across all crops for the three years is 1.90.

The third set of covariates incorporates demographic research that argues fostering is a response to a household's demographic imbalance (Meillassoux, 1992). Lloyd and Desai (1992) argue that a household with a higher number of younger siblings is more likely to send out a child. To capture these demographic effects on the household's sending decision, I include variables in the regression measuring the number of boys and girls aged zero to four, five to ten, and eleven to fifteen.

These three sets of covariates encompass the independent variables influencing the household's decision to send a child. I estimate this household sending decision using the following logit specification, $Prob(Sending_{ivt} = 1|X_{ivt}) = \frac{exp(\beta_0+X_{ivt}\beta)}{[1+exp(\beta_0+X_{ivt}\beta)]}$, where $Sending_{ivt}$ is a 0,1 dichotomous variable taking a value of one if household i in village v sent a child aged five to fifteen (inclusive) during year t and zero otherwise, and X_{ivt} are the variables measuring network quality, agricultural shocks, and household demographics for household i in village v at time t.[22] In the household sending regressions, I only include households that have children aged five to fifteen. Summary statistics for the variables used in the regression are in Table 4. I find a household is more likely to send out a child in a given year if it experiences a worse agricultural shock that year, has a better quality network where it can send the child, and has more girls aged five to fifteen.

[21] I estimate two additional shock measures for subsets of crops. First, I calculate a measure averaging the shocks for all grains (millet, sorghum, maize, and rice) grown by that household in a given year. Second, I calculate a measure averaging the shocks for the main staple crops, millet and sorghum, grown in a given year by that household. Results are qualitatively similar and robust when using these alternative measures of household agricultural shocks.

[22] To exploit the additional information present in the dependent variable for those households that sent multiple children in a given year, I estimate the household sending decision with an ordered logit model, where the dependent variable is the number of children sent by the household in a given year. The coefficient estimates and standard errors are similar to the logit specification discussed below because for this dataset, 88.8 percent of the household-year observations have no child sent, 9.5 percent of the household-year observations sent one child, and only 1.7 percent sent two children in a given year.

In Table 6, I present the marginal effects of an incremental change in the independent variables on the probability of a household sending a child in a given year. Column 1 includes the network quality measure calculated as the percentage of members above the 80th percentile and column 2 uses the ad hoc measure. In both cases, households with better quality networks are more likely to send out a child in a given year. Increasing by one percent the percentage of a household's good network members means the household would be 0.13 percent more likely to send a child in a given year. An increase of one standard deviation above the mean percentage of good network members in the household's network would increase the probability of sending a child in a given year by approximately 2.2 percent. A household with a good ad hoc network quality measure is 4.4 percent more likely to send a child in a given year. The coefficients for both network quality measures are significantly different from zero at the ten percent level. These results are consistent with the sociology literature's emphasis on network quality as a factor influencing a household's decision making. In addition, the magnitude of the effect due to network quality is large. With eleven percent of households presently sending children, a one standard deviation increase in the percentage of good members in the household's network leads to a twenty percent increase in fostering.

Both columns in Table 6 also indicate that households that experience worse agricultural shocks in a given year are more likely to send out a child, controlling for the household's history of shocks. A one unit increase (roughly one standard deviation) in the shock measure would increase the probability that a household sends a child by 3.1 percent. The results are significantly different from zero at the 5 percent level. Compared to the base level of household sending, a one standard deviation increase in shocks would lead to a 28.2 percent increase in fostering. In these regressions, I control for the history of shocks that the household faced, which is three years for this dataset (at time t, time $t-1$, and time $t-2$). The coefficients on the one and two period lagged shocks are negative and smaller, but they are not significantly different from zero.[23]

These results imply that shocks influence the household sending decision, but based on the theoretical model, there could be two distinct types of shocks, those affecting consumption and those affecting marginal productivity. In regressions not presented, I attempt to disentangle the consumption smoothing and labor productivity motivations for child fostering. In the previous

[23]Coefficient estimates and standard errors for the current period household shock are similar in regressions that only control for either one period lagged shocks or that do not control for any lagged shocks.

regressions, children are considered eligible to be fostered if they are aged five to fifteen inclusive, but there are also some younger foster children. Given that these younger children are not involved in household production, if I find that shocks influence the sending decision for young children, that is evidence in favor of the consumption smoothing explanation and against the labor productivity story. I estimate a regression with the dependent variable measuring household sending of children aged zero to six and the same independent variables as in column 1 of Table 6. The coefficient on household shocks is negative but not statistically significant. This is weak evidence that households send older, but not younger, children for labor productivity reasons. However, it is possible that the older child simply consumes more than the younger child, and therefore this result does not conclusively show that labor productivity is the only motivation behind household sending.

The household demographic variables indicate that if a household has more girls aged five to fifteen, it has a higher probability of sending a child in a given year. An additional older girl increases the probability of sending a child by 3.7 percent, while an additional girl aged five to ten increases the sending probability by two percent. The coefficient for the older girls variable is statistically significant at the one percent level, while the coefficient for the younger girls variable is significant at the ten percent level. Having additional boys or girls aged zero to four reduces the probability of sending a child, which is consistent with the explanation that older children are needed to care for their younger siblings, but the coefficients are not statistically significant. The results for the demographic variables are consistent with the demographic literature that argues a household will use fostering to cope with demographic imbalances and is more likely to send out a child if it has a redundancy of children in a particular age and gender category.

Table 7 presents logit regressions similar to those in Table 6, but that control for household wealth using several different measures. Results for network quality, shocks, and household demographics are robust to including these wealth measures. The household wealth variable in column 1 is measured as the value of the household's livestock and assets.[24] Column 2 presents a measure of the household's permanent income calculated as the three-year average of income earned from agricultural and non-agricultural sources. Column 3 presents a linear probability model in which I instrument for the household's wealth using characteristics of the respondent's parents as

[24]Assets include seventeen different items that rural households might typically own, such as a bicycle, a radio, a wheelbarrow, and a cart. To account for heterogeneity in asset quality across individuals, the value of each asset as reported by the respondent is used to measure total asset value.

instruments.[25] Results for the different household wealth measures indicate that permanent characteristics of the household are not important for the sending decision. None of the coefficients are statistically significant and all are close to zero.[26]

The logit regressions in Tables 6 and 7 also include village dummies to control for factors that are unique to each village. Possible village heterogeneity includes varying local weather patterns affecting agricultural shocks or access to different types of network members due to diverse migration patterns. Testing the joint significance of the village indicator variables yields a $\chi^2(14)$ test statistic of 26.77, with a corresponding p-value of 0.02.

4.2 Household Receiving Decision

Based on the theoretical framework, the same covariates influencing the household's decision to send a child should also influence the household's decision to receive a child. In this section, I examine the household receiving decision, but I do not find empirical evidence supporting this aspect of the model. The receiving decision analysis is organized in a similar way to the sending decision. I begin by trying to understand, for a household that received a child from a network member, why it selected that particular member's child. Analogous to Table 3, I present results from binary logit and household fixed effects logit regressions estimating the probability a given network member's child is received based on the network member's characteristics and the joint characteristics of the match. Results show that relationship and marital status are important indicators for selecting a network member's child, but occupation is not significant. Using these estimated coefficients, I calculate a comparable receiving household network quality. Parallel to Table 6, I then estimate the household decision to receive a child in a given year as a function of household level shocks, receiver's network quality, and household demographics. These variables are not statistically significant, with the exception being the number of older girls, which has an unexpected, positive coefficient. I also estimate a similar receiving regression that controls for household wealth, and richer households are significantly more likely to receive a child in a given year.

[25]The instruments include number of wives of the respondent's father, rank of respondent's mother among father's wives, number of children of respondent's father, number of children of respondent's mother, village level positions held by either the father or mother, and whether respondent was fostered as a child.

[26]I estimated additional sending regressions including a variable for household wealth interacted with shocks to measure the differential impact of negative shocks on rich and poor households, but the results were inconclusive. Similarly, results were statistically insignificant when I ran regressions including a variable for network quality interacted with shocks.

For the analysis of why a particular network member sent a foster child, I restrict the data to only those households that received children from immediate family network members between 1998 and 2000. Each child aged five to fifteen in an immediate family member's household linked with a receiving household forms an observation in the restricted dataset, totaling 1771 observations.

Table 8 presents the results from logit and household fixed effects logit regressions estimating the probability a network member's child is received. None of the occupation indicator variables are statistically significant. This is consistent with the findings in Table 7 that sender's wealth, which is highly correlated with occupation, is not an important determinant of the sending decision. If the network member is the respondent's parent or adult child, then the member is more likely to send a child compared to a brother or sister of the respondent. Network members who are recently married are 8.9 percent more likely to send a child, and members who are widowed or divorced are 3.2 percent more likely to send a child. These marital status results are consistent with the Table 3 results, in which network members with these characteristics were less likely to receive a child. If the network member attended school, the individual is less likely to send a child, but the coefficient is not significant. However, those network members with children in school are significantly less likely to send a child. Results for the demographic variables measuring the joint characteristics of the match provide some evidence that the foster child sent has a different age and gender than the receiving household's children, but similar to Table 3, the results are not statistically strong.

Replicating the sending household's network quality analysis, I construct a similar receiver's household network quality measure. I link every household in the sample, even if it did not receive a child, with every child aged five to fifteen in its network members' households. Using the estimated coefficients from the household fixed effects logit regression, I calculate the predicted value that a given network member's child would be received by the sample household, if the child were sent. The receiving network quality measure is calculated as the percentage of network members' children who have a predicted value of being selected that lies above the 80th percentile.

In Table 9, I present the marginal effects from a logit regression estimating the probability a household receives a child in a given year as a function of agricultural shocks, network quality, and own household demographics. For this receiving analysis, I use the same 358-observation sample used in the sending regressions, but observations from four villages are dropped because there are no receiving households in those villages.[27] The dependent variable, household receiving, takes a

[27]In Appendix Table 3, I recalculate the sending regression from Table 6 using the smaller 273-observation receiving

value of one if household i in village v received a child aged five to fifteen (inclusive) during year t and zero otherwise. Its mean is 0.08 with a standard deviation of 0.28.

Results in column 1 indicate that a household that experiences a worse shock is less likely to receive a child in a given year, but the coefficient is small and not statistically significant. The coefficient for network quality is close to zero and not significant. Likewise, the demographic variables are not significant, and they exhibit no clear pattern. Column 2 estimates the same regression controlling for household wealth. A one standard deviation increase in the household's wealth would increase the probability of receiving a child by 2.7 percent, a result significant at the five percent level. Similar to column 1, none of the other coefficients are significant.

4.3 Jointly Testing Sending and Receiving Decisions

The receiving regressions in Table 9 do not mirror the sending regressions in Table 6 due to the role of the non-fostering households. In the sending regression, senders are compared to a group of pooled households containing non-fostering and receiving households. In the receiving regression, receivers are compared to a group of pooled households that now contain non-fostering and sending households. Tables 6 and 9 provide evidence there is an asymmetry in the factors influencing sending and receiving households, but to test rigorously the theoretical framework, I compare the senders against the non-fostering households and the receivers against the non-fostering households.

In Table 10, I present the results of a multinomial logit regression estimating the probability a household sends a child, receives a child, or does neither in a given year. The dependent variable takes the value no fostering in 80.6 percent of the observations, sending in 11.7 percent of the observations, and receiving in 7.7 percent of the observations. To maintain consistency across regression specifications presented earlier, I use the 273-observation sample (based on the 358-observation sample in Table 6 with observations from four villages dropped due to no receiving).

The sending outcome results in column 1 are consistent with the sending regression in Table 6, except the standard errors are larger because the sample size is smaller. A one standard deviation increase in the household's shock increases the probability of sending a child by 3.3 percent. The demographic variables have similar results as before with households with additional girls aged five to fifteen more likely to send out a child. Compared to Table 6, the network quality coefficient is similar in magnitude, but has a larger standard error and is no longer significant. Column 2

sample. Results are similar, although the standard errors are larger.

presents the results for the receiving outcome, which are comparable to those in Table 9. None of the coefficients are statistically significant, except for the number of older girls.

The theoretical model implies that the factors influencing the sending decision should affect the receiving decision in an equal and opposite way. The multinomial logit results seem to indicate that the sending households are different from the non-fostering households, but the receiving households, at least by these measures, are not different from the non-fostering households. To test this implication, I calculate a likelihood ratio test of the joint restriction that the coefficients for shocks, network quality, and demographics for the sending outcome are equal and opposite to the coefficients for the receiving outcome. This yields a $\chi^2(10)$ test statistic of 23.31 with a corresponding p-value of 0.0097. Based on these results, I reject the theoretical model.

5 Conclusion

Given the potential welfare implications of child fostering and its prevalence in much of Africa, it is critical to understand why households are engaged in this activity. This paper examines the determinants of child fostering using household survey data I collected during eighteen months of fieldwork in Burkina Faso. The research methodology that involved locating the sending and receiving households participating in each fostering exchange makes these data particularly appropriate for this analysis.

I present a theoretical model in which the allocation of children across households is Pareto efficient. This framework provides theoretical motivation for three principal factors influencing why households foster children. First, households use child fostering as a risk-coping mechanism in response to exogenous income shocks. Second, a household is more likely to foster a child if it has better quality households in its social network that could potentially send or receive children. Third, households foster children to satisfy labor demands within the household. Those households with additional children of a given age and gender are more likely to send a child, while households with fewer children of a given age and gender are more likely to receive a child.

I find empirical evidence that these three covariates significantly influence the household's decision to send children, but not the decision to receive children. A one standard deviation increase in the household's shock measure increases the probability a household sends a child in a given year by 3.1 percent, a 28.2 percent increase above current fostering levels. Increasing a household's percentage of good network members by one standard deviation increases the probability of sending a child

in a given year by 2.2 percent, a twenty percent increase above current fostering levels. Having an additional older girl increases the probability of a household sending a child by 3.7 percent, a 33.6 percent increase above current levels. None of these variables influence the household's decision to receive children.

One implication of this theoretical framework is that the factors influencing a household's decision to send a child should influence in an equal and opposite way a household's decision to receive a child. To test this implication, I calculate a likelihood ratio test that the coefficients from the sending outcome of a multinomial logit regression are equal and opposite to the coefficients from the receiving outcome. The test result leads me to reject the Pareto efficient model.

Building on these results, future research should address several questions. First, it is important to develop a better understanding of the welfare implications for foster children, in particular, incorporating information about the reason why the child was fostered. To accurately measure these child welfare implications, it is also necessary to use information about the child's biological siblings and home environment prior to the fostering to control for other factors that might influence welfare outcomes. Second, to improve development policy programs, it is essential to understand other mechanisms households use to cope with risk and the role child fostering plays in the overall risk-coping strategy for a household.

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Table 1: Tabulation of Whether Immediate Family Member Received a Foster Child, Broken Down by Relationship of Immediate Family Member With Sending Family (Column Percent)

Relationship	Did Not Receive Foster Child	Received Foster Child
Parents	8.6%	31.9%
Brother	39.1%	26.9%
Sister	40.5%	20.0%
Adult Non-coresident Children	11.8%	21.2%
Number of Immediate Family Members	2204	160

Note: For those immediate family members who did not receive a foster child, column 1 presents the percentage of these members broken down by their relationship to the sending family. Column 2 presents the percentage of members broken down by relationship, for those members that did receive a foster child. Testing for the independence of the rows and columns yields a likelihood-ratio $\chi^2(3)$ test statistic equal to 87.7 with the corresponding p-value equal to 0. Data source: Author's survey.

Table 2: Tabulation of Whether Immediate Family Member Received a Foster Child, Broken Down by Immediate Family Member's Occupation (Column Percent)

Occupation	Did Not Receive Foster Child	Received Foster Child
Farmer	72.6%	69.4%
Employee, bureaucrat	3.5%	5.0%
Business person	8.1%	12.5%
Manual labor	1.8%	2.5%
Housewife	6.6%	4.4%
Other job	3.5%	5.0%
Unemployed, retired	3.9%	1.2%
Number of Immediate Family Members	2204	160

Note: For those immediate family members who did not receive a foster child, column 1 presents the percentage of these members in each occupation. Column 2 presents the percentage of members by occupation for those members that did receive a foster child. Testing for the independence of the rows and columns yields a likelihood-ratio $\chi^2(6)$ test statistic equal to 10.2 with the corresponding p-value equal to 0.12. Data source: Author's survey.

Table 3: Marginal Effects for Logit and Household Fixed Effect Logit Regressions Estimating Probability of Selecting a Given Network Member to Receive a Foster Child

Dependent Variable: Network member is selected	(1) Logit	(2) HH Fixed Effect Logit
Employee, bureaucrat	0.032**	0.040
	[0.015]	[0.029]
Business person	0.041***	0.067***
	[0.012]	[0.020]
Manual labor	0.037**	0.062
	[0.019]	[0.040]
Housewife	-0.007	-0.030
	[0.015]	[0.032]
Other job	0.039***	0.067**
	[0.015]	[0.030]
Retired, unemployed	-0.057*	-0.089*
	[0.030]	[0.049]
Parents	0.084***	0.129***
	[0.012]	[0.019]
Sisters	-0.016	-0.025
	[0.011]	[0.017]
Adult Non-coresident Children	0.043***	0.079***
	[0.010]	[0.019]
Recently married	-0.026*	-0.043*
	[0.014]	[0.024]
Widowed/Divorced	-0.049***	-0.087***
	[0.014]	[0.022]
Never Married	-0.066***	-0.107***
	[0.018]	[0.029]
Attended school	0.004	0.025
	[0.012]	[0.023]
Has kids in school	-0.007	-0.019
	[0.011]	[0.019]
Network Member Has Boys 0-5	-0.022*	-0.038
	[0.013]	[0.024]
Network Member Has Boys 6-10	-0.021	-0.034
	[0.013]	[0.023]
Network Member Has Boys 11-15	0.007	0.007
	[0.015]	[0.026]
Network Member Has Girls 0-5	-0.011	-0.022
	[0.013]	[0.022]
Network Member Has Girls 6-10	0.001	0.001
	[0.012]	[0.023]
Network Member Has Girls 11-15	-0.008	-0.014
	[0.019]	[0.029]
Birth in 2000	-0.008	-0.010
	[0.011]	[0.020]
Birth in 1999	-0.010	-0.006
	[0.014]	[0.022]
Birth in 1998	-0.001	0.005
	[0.012]	[0.021]

Boy Sent aged 5-10	-0.020*	0.003
	[0.011]	[0.034]
Girl Sent aged 11-15	-0.017	0.011
	[0.011]	[0.036]
Boy Sent aged 11-15	-0.045***	-0.071
	[0.015]	[0.048]
(Boy Sent 5-10)*(Network Member Has Boys 0-5)	-0.011	-0.001
	[0.022]	[0.038]
(Boy Sent 5-10)*(Network Member Has Boys 6-10)	-0.004	-0.018
	[0.020]	[0.039]
(Boy Sent 5-10)*(Network Member Has Boys 11-15)	0.017	0.043
	[0.021]	[0.042]
(Boy Sent 5-10)*(Network Member Has Girls 0-5)	0.025	0.050
	[0.019]	[0.035]
(Boy Sent 5-10)*(Network Member Has Girls 6-10)	0.004	0.002
	[0.022]	[0.038]
(Boy Sent 5-10)*(Network Member Has Girls 11-15)	0.033	0.052
	[0.028]	[0.045]
(Boy Sent 11-15)*(Network Member Has Boys 0-5)	0.007	0.019
	[0.027]	[0.044]
(Boy Sent 11-15)*(Network Member Has Boys 6-10)	0.011	0.016
	[0.028]	[0.046]
(Boy Sent 11-15)*(Network Member Has Boys 11-15)	0.014	0.011
	[0.030]	[0.050]
(Boy Sent 11-15)*(Network Member Has Girls 0-5)	0.077***	0.148***
	[0.025]	[0.046]
(Boy Sent 11-15)*(Network Member Has Girls 6-10)	-0.017	-0.015
	[0.027]	[0.049]
(Boy Sent 11-15)*(Network Member Has Girls 11-15)	0.005	0.006
	[0.038]	[0.060]
(Girl Sent 11-15)*(Network Member Has Boys 0-5)	-0.013	-0.026
	[0.021]	[0.034]
(Girl Sent 11-15)*(Network Member Has Boys 6-10)	0.032	0.056
	[0.023]	[0.037]
(Girl Sent 11-15)*(Network Member Has Boys 11-15)	0.018	0.050
	[0.024]	[0.041]
(Girl Sent 11-15)*(Network Member Has Girls 0-5)	-0.025	-0.050
	[0.023]	[0.038]
(Girl Sent 11-15)*(Network Member Has Girls 6-10)	-0.021	-0.045
	[0.022]	[0.037]
(Girl Sent 11-15)*(Network Member Has Girls 11-15)	0.037	0.047
	[0.027]	[0.043]
Number of Observations	2364	2364
Log-Likelihood Value:	-496.65	-342.80

Note: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. The omitted categories for the dummy variables included in the regression are as follows: occupation variable is farmer, relationship to respondent variable is brother, marital status variable is married longer than 4 years, child sent variable is girl aged 5 to 10, age-gender interaction variables are all interactions with girl sent aged 5 to 10. Data source: Author's survey.

Table 4: Means and Standard Deviations for Household Level Characteristics

Variables	Mean	Standard Deviation
Proportion of Households Sending Children	0.11	0.32
Percentage of good network members	29.22	16.88
Proportion of households with good ad hoc network quality measure	0.54	0.50
Number of network members	13.38	7.89
Household shock t	1.90	0.96
Household shock t-1	1.23	1.01
Household shock t-2	1.15	1.07
Household Wealth (in 100,000 FCFA)	4.19	7.34
Household Permanent Income (in 100,000 FCFA)	1.29	1.65
Number of Boys Aged 0 to 4	0.58	0.74
Number of Boys Aged 5 to 10	0.88	0.89
Number of Boys Aged 11 to 15	0.78	0.95
Number of Girls Aged 0 to 4	0.65	0.73
Number of Girls Aged 5 to 10	0.99	1.06
Number of Girls Aged 11 to 15	0.68	0.84
Number of observations	358	

Note: Ad hoc network quality measure is measured as good if the household has network members who are business people and network members who are either parents or adult children. The percentage of good network members is calculated as the percentage of the household's network members with a predicted value of being selected to receive a foster child that lies above the 80^{th} percentile (more details on both network quality measures are in the paper). Household shocks are calculated as the average of the shock measures, which range from zero (no loss) to three (large loss), for every crop grown by that household in that year. Household wealth and permanent income are measured in units of 100,000 FCFA, with the average exchange rate between 1998 and 2000, $1 USD = 641 FCFA. Household wealth is measured as the value of the household's livestock and assets in a given year. Permanent income is measured as the three-year average of household income earned from agricultural and non-agricultural sources. Data source: Author's survey.

Table 5: Tabulation of Whether Household Sent a Child, Broken Down by Household's Network Quality (Column Percent)

Median Network Quality	Did Not Send a Child	Sent a Child
Household with percentage of good members below median value	51.9%	35.0%
Household with percentage of good members above median value	48.1%	65.0%
Number of Household-Year Observations	318	40

Note: For those households that did not send a child in a given year, column 1 records the percentage of those households that had above or below the median network quality of 26.2%. Column 2 presents the same percentage for those households that did send a child. Testing for the independence of the rows and columns yields a likelihood-ratio $\chi^2(1)$ test statistic equal to 4.1 with the corresponding p-value equal to 0.04. Data source: Author's survey.

Table 6: Marginal Effects from Household Level Logit Regressions Estimating Probability of Sending a Child in a Given Year

Dependent Variable: Household Sending	(1)	(2)
Percentage of good network members	0.00129*	
	[0.00075]	
Ad hoc network quality		0.044*
(Parents/Adult Kids * Businessman)		[0.025]
Household shock t	0.031**	0.031**
	[0.013]	[0.013]
Household shock t-1	-0.002	-0.000
	[0.014]	[0.014]
Household shock t-2	-0.020	-0.015
	[0.014]	[0.014]
Number of Boys 0-4	-0.013	-0.015
	[0.014]	[0.015]
Number of Boys 5-10	0.002	0.002
	[0.013]	[0.013]
Number of Boys 11-15	0.019	0.023
	[0.016]	[0.015]
Number of Girls 0-4	-0.016	-0.021
	[0.019]	[0.018]
Number of Girls 5-10	0.020*	0.017
	[0.010]	[0.011]
Number of Girls 11-15	0.037***	0.041***
	[0.014]	[0.013]
Number of Observations	358	358

Note: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. Both regressions also include village dummies. Data source: Author's survey.

Table 7: Household Level Logit and Linear Probability Model Regressions Estimating Probability of Sending a Child in a Given Year Including Wealth Measures

Dependent Variable: Household Sending	(1) Logit Marginal Effects	(2) Logit Marginal Effects	(3) Linear Probability Model
Household wealth	0.0003		
	[0.0015]		
Household permanent income		0.0021	
		[0.0078]	
Predicted household wealth using parents' characteristics as instruments			-0.0002
			[0.0099]
Percentage of good network members	0.00128*	0.00129*	0.0014
	[0.00075]	[0.00075]	[0.0011]
Household shock t	0.032**	0.032**	0.045**
	[0.013]	[0.013]	[0.022]
Household shock t-1	-0.002	-0.001	0.001
	[0.014]	[0.015]	[0.021]
Household shock t-2	-0.020	-0.021	-0.025
	[0.014]	[0.014]	[0.022]
Number of Boys 0-4	-0.013	-0.013	-0.019
	[0.014]	[0.014]	[0.020]
Number of Boys 5-10	0.001	0.001	-0.001
	[0.013]	[0.013]	[0.024]
Number of Boys 11-15	0.019	0.019	0.030
	[0.016]	[0.016]	[0.023]
Number of Girls 0-4	-0.016	-0.017	-0.014
	[0.019]	[0.018]	[0.026]
Number of Girls 5-10	0.020*	0.020**	0.032*
	[0.010]	[0.010]	[0.018]
Number of Girls 11-15	0.037***	0.037***	0.062**
	[0.014]	[0.014]	[0.029]

Note: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. All regressions also include village dummies. In column 3, household wealth is instrumented using the following characteristics of the respondent's parents: number of wives of respondent's father, rank of respondent's mother among father's wives, number of children of respondent's father, number of children of respondent's mother, village level positions held by either the father or mother, and whether respondent was fostered as a child. Data source: Author's survey.

Table 8: Marginal Effects for Logit and Household Fixed Effect Logit Regressions Estimating Probability of a Network Member's Child Being Received

Dependent Variable:	(1)	(2)
Network member's child is received	Logit	HH Fixed Effect Logit
Employee, bureaucrat	-0.011	-0.026
	[0.034]	[0.052]
Business person	-0.014	-0.059
	[0.019]	[0.039]
Manual labor	0.006	0.003
	[0.049]	[0.071]
Housewife	0.002	-0.028
	[0.020]	[0.042]
Other job	0.007	-0.008
	[0.027]	[0.046]
Retired, unemployed	-0.043	-0.035
	[0.037]	[0.071]
Parents	0.034***	0.047
	[0.011]	[0.029]
Sisters	-0.009	-0.025
	[0.014]	[0.021]
Adult Non-coresident Children	0.049***	0.112***
	[0.010]	[0.026]
Recently married	0.089***	0.144***
	[0.031]	[0.055]
Widowed/Divorced	0.032*	0.053*
	[0.017]	[0.031]
Network Member Attended School	-0.019	-0.051
	[0.023]	[0.052]
Network Member Has Kids in School	-0.024**	-0.038**
	[0.010]	[0.018]
Birth in 2000	0.005	0.013
	[0.009]	[0.018]
Birth in 1999	-0.008	-0.015
	[0.011]	[0.021]
Birth in 1998	0.001	0.006
	[0.010]	[0.021]
Boy sent aged 5-10	-0.054***	-0.077
	[0.021]	[0.031]
Girl sent aged 11-15	0.016	0.030
	[0.016]	[0.028]
Boy sent aged 11-15	-0.016	-0.016
	[0.019]	[0.033]
Receiving Household has Boys 0-4	0.007	0.021
	[0.014]	[0.071]
Receiving Household has Boys 5-10	0.015	-0.112
	[0.015]	[0.117]

Receiving Household has Boys 11-15	-0.016	0.096
	[0.013]	[0.092]
Receiving Household has Girls 0-4	-0.029*	-0.049
	[0.015]	[0.075]
Receiving Household has Girls 5-10	-0.004	0.089
	[0.013]	[0.106]
Receiving Household has Girls 11-15	-0.024*	-0.132*
	[0.012]	[0.073]
(Boy Sent 5-10)*(Receiving Household Has Boys 0-4)	-0.006	-0.014
	[0.028]	[0.045]
(Boy Sent 5-10)*(Receiving Household Has Boys 5-10)	-0.019	-0.009
	[0.033]	[0.049]
(Boy Sent 5-10)*(Receiving Household Has Boys 11-15)	0.011	0.009
	[0.025]	[0.040]
(Boy Sent 5-10)*(Receiving Household Has Girls 0-4)	0.032	0.039
	[0.028]	[0.046]
(Boy Sent 5-10)*(Receiving Household Has Girls 5-10)	-0.002	-0.008
	[0.025]	[0.043]
(Boy Sent 5-10)*(Receiving Household Has Girls 11-15)	0.047**	0.073*
	[0.022]	[0.039]
(Boy Sent 11-15)*(Receiving Household Has Boys 0-4)	0.026	0.031
	[0.033]	[0.062]
(Boy Sent 11-15)*(Receiving Household Has Boys 5-10)	-0.084**	-0.131*
	[0.035]	[0.071]
(Boy Sent 11-15)*(Receiving Household Has Boys 11-15)	-0.002	0.005
	[0.032]	[0.053]
(Boy Sent 11-15)*(Receiving Household Has Girls 0-4)	0.093***	0.155***
	[0.028]	[0.051]
(Boy Sent 11-15)*(Receiving Household Has Girls 5-10)	-0.042	-0.084
	[0.035]	[0.053]
(Boy Sent 11-15)*(Receiving Household Has Girls 11-15)	0.013	0.016
	[0.034]	[0.055]
(Girl Sent 11-15)*(Receiving Household Has Boys 0-4)	-0.031	-0.038
	[0.024]	[0.047]
(Girl Sent 11-15)*(Receiving Household Has Boys 5-10)	0.031	0.023
	[0.028]	[0.048]
(Girl Sent 11-15)*(Receiving Household Has Boys 11-15)	0.026	0.058
	[0.023]	[0.041]
(Girl Sent 11-15)*(Receiving Household Has Girls 0-4)	0.032	0.056
	[0.023]	[0.042]
(Girl Sent 11-15)*(Receiving Household Has Girls 5-10)	-0.047**	-0.080*
	[0.023]	[0.044]
(Girl Sent 11-15)*(Receiving Household Has Girls 11-15)	0.005	0.018
	[0.023]	[0.043]
Number of Observations	1771	1771
Log-Likelihood Value:	-373.02	-252.70

Note: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. The omitted categories for the dummy variables included in the regression are as follows: occupation variable is farmer, relationship to respondent variable is brother, marital status variable is married longer than 4 years, child sent variable is girl aged 5 to 10, age-sex interaction variables are all interactions with girl sent aged 5 to 10. Data source: Author's survey.

Table 9: Marginal Effects from Household Level Logit Regressions Estimating Probability of Receiving a Child in a Given Year

Dependent Variable: Household Receiving	(1)	(2)
Receiver network quality (Percentage of good opportunities in household's network)	0.00001 [0.00045]	-0.00002 [0.00043]
Household wealth		0.0037** [0.0015]
Household shock t	-0.003 [0.015]	0.003 [0.016]
Household shock t-1	-0.018 [0.021]	-0.016 [0.020]
Household shock t-2	0.006 [0.018]	0.007 [0.017]
Number of Boys 0-4	-0.005 [0.022]	-0.009 [0.022]
Number of Boys 5-10	-0.009 [0.016]	-0.014 [0.015]
Number of Boys 11-15	0.014 [0.017]	0.012 [0.017]
Number of Girls 0-4	-0.034 [0.021]	-0.033 [0.021]
Number of Girls 5-10	-0.002 [0.016]	-0.004 [0.014]
Number of Girls 11-15	0.027* [0.015]	0.020 [0.014]
Number of Observations	273	273

Note: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. Regressions also include village dummies. Sample used in the receiving analysis is the same 358-observation sample as for the sending regression, but 4 villages are dropped due to no receiving in those villages. Results in the sending regression are similar when using the smaller 273-observation sample. The mean of the dependent variable, household receiving, is 0.08, with a standard deviation of 0.28. Data source: Author's survey.

Table 10: Marginal Effects from Household Level Multinomial Logit Regression Estimating Probability of Sending, Receiving, or No Fostering

Dependent Variable: No Foster, Send, Receive	(1) Sending	(2) Receiving
Sender Network Quality (Percentage of good network members in household's network)	0.00109 [0.00102]	-0.00003 [0.00011]
Household shock t	0.033** [0.016]	-0.001 [0.002]
Household shock t-1	-0.005 [0.019]	-0.002 [0.003]
Household shock t-2	-0.019 [0.019]	0.001 [0.003]
Number of Boys 0-4	-0.018 [0.018]	-0.001 [0.004]
Number of Boys 5-10	0.011 [0.014]	-0.002 [0.002]
Number of Boys 11-15	0.009 [0.018]	0.002 [0.002]
Number of Girls 0-4	-0.031 [0.024]	-0.004 [0.003]
Number of Girls 5-10	0.031** [0.013]	-0.000 [0.003]
Number of Girls 11-15	0.047** [0.019]	0.0043* [0.0026]
Number of Observations	273	273

Note: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. Regression also includes village dummies. The likelihood ratio test of the joint restriction that the coefficients for the sending regression are equal and opposite to the coefficients for the receiving regression yields a $\chi^2(10)$ test statistic of 23.31 with a corresponding p-value of 0.0097. Data source: Author's survey.

Appendix Table 1: Summary Statistics From Author's Burkina Faso Household Survey

Percentage of Households Fostering a Child During 1998 to 2000	27%
Percentage of Households Sending a Child During 1998 to 2000	16%
Percentage of Households Receiving a Child During 1998 to 2000	14%
Percentage of Households Sending and Receiving a Child During 1998 to 2000	3%
Percentage of Children (Aged 5 to 15) Living Away From Biological Parents	10%
Average Duration Spent Away From Parents (in years)	2.75
Location of Where Foster Children Were Sent/Received	
Percentage of Foster Children Within 25 Mile Radius of Parents	60%
Percentage of Foster Children In Capital City, Ouagadougou (50 miles away)	25%
Percentage of Foster Children In Other Provinces of Burkina Faso	6%
Percentage of Foster Children In Côte d'Ivoire (800 miles away)	9%
Primary School Enrollment Rate[1]	26%
Primary School Enrollment Rate—Non-fostered Children	27%
Primary School Enrollment Rate—Fostered Children	23%
Average Number of Members in each Household	10.6
Average Number of Wives in each Household	1.5
Average Number of Children Under Age 18 in each Household	3.6
Average Number of Children Above Age 18 in each Household	3.2
Average Number of Additional Other Members in each Household	1.3
Average Number of Each Household's Immediate Family Network Members	13
Average Household Income	$183

Note: Data source: Author's survey.
[1] Primary school enrollment rate is defined as the number of children aged 8 to 14 enrolled in primary school divided by the total population of the same age group.

Appendix Table 2: Means and Standard Deviations for Network Members' Characteristics

Variables	Mean	Standard Deviation
Dependent Variable=Network Member Selected	0.068	0.251
Occupation Variables		
Employee, bureaucrat	0.036	0.187
Business person	0.084	0.277
Manual labor	0.018	0.134
Housewife	0.064	0.245
Other job	0.036	0.187
Retired, unemployed	0.037	0.189
Relationship to network member		
Parents	0.102	0.302
Sisters	0.391	0.488
Adult Kids	0.124	0.330
Marital Status		
Recently Married	0.093	0.291
Widowed/Divorced	0.110	0.313
Never Married	0.092	0.289
Education		
Attended school	0.076	0.265
Network Member Has Kids in School	0.158	0.365
Network Member's Household Demographics		
Network Member Has Boys 0-5	0.362	0.481
Network Member Has Boys 6-10	0.313	0.464
Network Member Has Boys 11-15	0.164	0.370
Network Member Has Girls 0-5	0.304	0.460
Network Member Has Girls 6-10	0.266	0.442
Network Member Has Girls 11-15	0.122	0.327
Birth in 2000	0.209	0.406
Birth in 1999	0.131	0.337
Birth in 1998	0.142	0.349
Characteristics of Child Sent		
Boy Sent aged 5-10	0.186	0.389
Girl Sent aged 11-15	0.297	0.457
Boy Sent aged 11-15	0.126	0.332
Number of Observations	2364	

Note: Data source: Author's survey. Every variable is a 0, 1 indicator recording whether the network member possessed that characteristic. Means indicate percentage of network members that possess that characteristic.

Appendix Table 3: Marginal Effects from Household Level Logit Regression Estimating Probability of Sending a Child in a Given Year Using Restricted 273-Observation Sample

Dependent Variable: Household Sending	(1)
Percentage of good network members in household's network	0.00131 [0.00096]
Household shock t	0.035** [0.016]
Household shock t-1	-0.004 [0.018]
Household shock t-2	-0.024 [0.018]
Number of Boys 0-4	-0.018 [0.018]
Number of Boys 5-10	0.013 [0.013]
Number of Boys 11-15	0.006 [0.017]
Number of Girls 0-4	-0.032 [0.022]
Number of Girls 5-10	0.027** [0.013]
Number of Girls 11-15	0.044** [0.017]
Number of Observations	273

Note: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. Regression also includes village dummies. Sample used in this analysis is the restricted 273-observation sample that corresponds to the 358-observation sending regression dropping the 4 villages with no receiving households. Data source: Author's survey.