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

Richard Akresh*

Department of Economics

Yale University

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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. There is an ongoing debate in academic research about the welfare implications due to child fostering, but prior to measuring these welfare impacts, it is critical to first 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 and tests a theoretical model in which the allocation of children across households in a social network is Pareto efficient. This framework provides the theoretical motivation for 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 28, 20, and 34 percent, respectively. Testing that the factors influencing the sending decision affect the receiving decision in an equal and opposite way 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. During 1998 to 2000, approximately twenty-seven percent of households in rural Burkina Faso either sent or received a foster child.[1] This practice of sending children to live away from their biological parents involved almost ten percent of all children aged five to fifteen inclusive during this time period.[2] On average, these foster children spent two years and nine months away from their parents. Living away from their parents might put these children at risk of reduced educational attainment or worse health outcomes. 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). These researchers argue this will further impair Africa's economic growth and limit its ability to achieve sustainable development. However, several researchers question this conclusion and argue that 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. The simplest theoretical structure with which I can study this decision is a model in which children are efficiently allocated across households. This Pareto efficient framework serves as the benchmark

[1] Data source is the household survey I conducted in Burkina Faso during 2001. 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 estimates from other Burkina Faso data sources that use slightly different children's age ranges and are not restricted to 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 in Burkina Faso of 4500 randomly sampled rural households 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 dataset I collected, tries to measure these welfare impacts by comparing outcomes of foster children to both their foster siblings and their biological siblings.

for the analysis of the household decision to send or receive children that is developed more fully in Section 2.

The theoretical framework provides motivation for three principal reasons why households foster children. First, households use child fostering as a risk-coping mechanism in response to exogenous income shocks. Households that experience worse shocks are more likely to send out a child, and 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. In the theoretical and empirical sections, I discuss in more detail the attributes that make one network member better than another and how I quantitatively measure a household's network quality. Third, in order to fulfill diverse labor needs within the household, parents seek to offset demographic imbalances in the number of their children in a given age and gender class. Children perform chores in the household that might include cooking, cleaning, washing laundry, childcare, fetching wood, and running errands. Having too many or too few children in the same gender and age class may not optimize household production; as a result, fostering is more likely to occur in such situations.

The household survey data I collected 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 Pareto efficient framework is that factors influencing the sending decision should influence the receiving decision in an equal and opposite way. Based on the empirical evidence, I reject the Pareto efficient 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

[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 Pareto efficient 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 version of the Pareto efficient model is outside the scope of this paper.

child labor plays a role in household fostering decisions. Using data from the 1985 Côte d'Ivoire Living Standards Survey, Ainsworth is able to examine 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 that Ainsworth tests is whether households decide to send out children as a strategy for educational investment when local opportunities are limited. Her empirical findings are inconclusive with respect to this being the sender's motivation. Although she is unable to confirm the educational investment hypothesis, several sociologists and demographers provide evidence supporting it (Goody, 1982; Chernichovsky, 1985; Gould, 1985; Isiugo-Abanihe, 1985; Page, 1989). In subsequent research, 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, every household cited the reason why each child was sent or received, and only nine percent listed schooling. Given that schooling is perceived by the respondents as a positive reason for fostering a child as compared to child labor reasons, nine percent seems like an upper bound for the number of children actually fostered for schooling. Second, the primary school enrollment rate for children in the households I surveyed is only twenty-six percent.[5] Breaking down these rates by whether the child was fostered or not shows that non-fostered children have a primary school enrollment rate of twenty-seven percent compared to foster children who have a twenty-three percent enrollment rate. Using a two-tailed t-test to examine the equality of these enrollment rates across the two groups, I cannot reject that they are equal with a corresponding p-value of 0.23. This is further evidence that foster children are no more likely to be enrolled compared to non-fostered children.

This article extends the risk-coping literature by providing evidence for another mechanism

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

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] However, outside of economics, there is further evidence supporting my findings that households foster children in response to shocks. Sociologists and demographers provide evidence that households use fostering as a way to deal with uncertainty and risk (Brydon, 1979; Etienne, 1979; Goody, 1982; Bledsoe and Isiugo-Abanihe, 1989). Other researchers argue that fostering is used to reduce household expenses, particularly for those households that have limited resources and are therefore more vulnerable (Piche and Poirier, 1990; Locoh, 1997). One economist develops a theoretical model showing that risk might motivate households to foster children, but is unable to empirically test the model (Serra, 1996).

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 Pareto efficient, theoretical model motivating 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 the theoretical model. Section 5 concludes.

[6]This paper does not try to explain or understand other mechanisms besides child fostering that the household might use to cope with risk. A related paper attempts to measure the household's dynamic response to negative shocks. For example, the household might first undertake dry season activities in order to supplement its income. The members can then ask family and neighbors for gifts or loans to help them cope. They might then sell some of their assets, in particular livestock, to deal with the shock. It may be the case that when the household has exhausted these other risk-coping mechanisms, it decides to send out a child to reduce the burden on household finances and food supply.

2 Theoretical Model of Child Fostering

To understand the household decision to send or receive children, I develop a 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.[7]

To illustrate this framework, I examine the case of only two households, indexed by i and j, in a social network. 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 $\mathbf{F}_s$ is a vector representing the number of foster children if state s occurs and measures the different age and gender classes of these foster children. In the model, the number of foster children is defined on the set of real numbers and is not limited to integer values.[8] The variable is negative if household i sent a foster child and household j received the child, and the variable is positive if household i received a foster child and household j sent the child.

Household i's consumption, if state s occurs, is defined as C_{is}. This consumption is determined by its production function for state s, G_{is}, that depends only on adult and child labor. Capital is not considered in the model since almost no households in the survey area use capital inputs such as animal traction. Land, which can be heterogeneous across households, is assumed to be part of the production function. The production function incorporates permanent characteristics about the household, such as occupation, marital status, and education, that influence how the household utilizes labor. Assuming that the marginal product of labor for adults is not affected by the number of children allows me to restrict analysis to the household decision regarding just child labor. The production function for household i accounting only for child labor is $G_{is}(\mathbf{K}_i + \mathbf{F}_s)$. The production function is increasing and concave in child labor, $G'_{is}() > 0$, $G''_{is}() < 0$.

[7] The empirical evidence rejects this implication, indicating a richer model of household decision making, which incorporates altruism and treats foster children differently than biological children, is needed.

[8] Imposing an integer constraint on the number of foster children would qualitatively give 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.

For household i, I define utility, U_i, to be a function of resident children's per capita consumption, $\frac{C_{is}}{(\mathbf{K}_i+\mathbf{F}_s)}$. The utility function is twice continuously differentiable with $U'() > 0, U''() < 0$. Household i is assigned a weight, λ_i, in the Pareto program where $0 < \lambda_i < 1; \lambda_i + \lambda_j = 1$. The model focuses only on the household's decision of whether to foster a child in a given state of nature. The timing in the model is such that households in the social network pick a vector of potential fostering decisions at the start of the model, the state of nature is observed, the household completes the fostering exchange that it committed to at the start of the model, then production and consumption outcomes are realized.[9]

A Pareto efficient allocation of children within the social network can be found by maximizing the following weighted sum of expected utilities for each of the two households:

$$\underset{\{\mathbf{F}_s\}}{Max} \ \lambda_i \sum_{s=1}^{S} \pi_s U_i \left(\frac{C_{is}}{(\mathbf{K}_i + \mathbf{F}_s)} \right) + \lambda_j \sum_{s=1}^{S} \pi_s U_j \left(\frac{C_{js}}{(\mathbf{K}_j - \mathbf{F}_s)} \right) \tag{1}$$

subject to the following production constraints, $C_{is} = G_{is}(\mathbf{K}_i + \mathbf{F}_s)$ and $C_{js} = G_{js}(\mathbf{K}_j - \mathbf{F}_s)$. Plugging in the production constraints and taking the derivative with respect to $\mathbf{F}_s$ yields the following first order condition:

$$\frac{U_i' \left(\frac{G_{is}(\mathbf{K}_i+\mathbf{F}_s)}{(\mathbf{K}_i+\mathbf{F}_s)} \right) \left[\frac{G_{is}(\mathbf{K}_i+\mathbf{F}_s)-(\mathbf{K}_i+\mathbf{F}_s)G_{is}'(\mathbf{K}_i+\mathbf{F}_s)}{(\mathbf{K}_i+\mathbf{F}_s)^2} \right]}{U_j' \left(\frac{G_{js}(\mathbf{K}_j-\mathbf{F}_s)}{(\mathbf{K}_j-\mathbf{F}_s)} \right) \left[\frac{G_{js}(\mathbf{K}_j-\mathbf{F}_s)-(\mathbf{K}_j-\mathbf{F}_s)G_{js}'(\mathbf{K}_j-\mathbf{F}_s)}{(\mathbf{K}_j-\mathbf{F}_s)^2} \right]} = \frac{\lambda_j}{\lambda_i} \tag{2}$$

This first-order condition implies that households i and j will determine optimal fostering in order to equate the ratio of Pareto welfare weights with the ratio of marginal utilities for each household times a term measuring the production effect due to changing household structure. The first-order condition corresponding to two states of nature, s and v, implies:

$$\frac{U_i' \left(\frac{G_{is}(\mathbf{K}_i+\mathbf{F}_s)}{(\mathbf{K}_i+\mathbf{F}_s)} \right) \left[\frac{G_{is}(\mathbf{K}_i+\mathbf{F}_s)-(\mathbf{K}_i+\mathbf{F}_s)G_{is}'(\mathbf{K}_i+\mathbf{F}_s)}{(\mathbf{K}_i+\mathbf{F}_s)^2} \right]}{U_i' \left(\frac{G_{iv}(\mathbf{K}_i+\mathbf{F}_v)}{(\mathbf{K}_i+\mathbf{F}_v)} \right) \left[\frac{G_{iv}(\mathbf{K}_i+\mathbf{F}_v)-(\mathbf{K}_i+\mathbf{F}_v)G_{iv}'(\mathbf{K}_i+\mathbf{F}_v)}{(\mathbf{K}_i+\mathbf{F}_v)^2} \right]} = \frac{U_j' \left(\frac{G_{js}(\mathbf{K}_j-\mathbf{F}_s)}{(\mathbf{K}_j-\mathbf{F}_s)} \right) \left[\frac{G_{js}(\mathbf{K}_j-\mathbf{F}_s)-(\mathbf{K}_j-\mathbf{F}_s)G_{js}'(\mathbf{K}_j-\mathbf{F}_s)}{(\mathbf{K}_j-\mathbf{F}_s)^2} \right]}{U_j' \left(\frac{G_{jv}(\mathbf{K}_j-\mathbf{F}_v)}{(\mathbf{K}_j-\mathbf{F}_v)} \right) \left[\frac{G_{jv}(\mathbf{K}_j-\mathbf{F}_v)-(\mathbf{K}_j-\mathbf{F}_v)G_{jv}'(\mathbf{K}_j-\mathbf{F}_v)}{(\mathbf{K}_j-\mathbf{F}_v)^2} \right]} \tag{3}$$

where the optimal level of fostering is independent of the Pareto welfare weights, λ_i and λ_j.

To more clearly view the different motivations for fostering children, it is instructive to examine

[9] 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.

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 sharing reasons. I assume there is complete insurance with perfect capital markets. Even with perfect capital markets, households will foster children to equate the marginal product of labor across households in the network. Families that have many children of a given age and gender will send children, while households that have few children will be receivers.

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 is no insurance or financial markets, but fostering can serve as an insurance substitute. Consumption is now defined to be a stochastic shock. 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 children, while if it experiences high consumption, it will receive children.

While these two sub-cases are illustrative, in the general case both explanations might influence the optimal level of fostering. In addition, the production function, G_j, which incorporates permanent characteristics about household j, can influence fostering decisions for household i. A household that has a social network member with a better production function is more likely to send a child, while if the social network member has a worse production function, household i is more likely to receive a child.

3 Empirical Setting

Testing this theoretical model requires detailed information on social networks, household risk-coping mechanisms, and foster children's placement. Because currently existing data from Africa are not adequate for testing this model, I spent eighteen months in Burkina Faso conducting household surveys to gather the necessary information.[10] Burkina Faso was selected for this study for two reasons. First, it is thought to be a major supplier of foster children (International Labor Organization, 2001), many of whom are sent to Cote d'Ivoire. 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 cap-

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

ital, 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 an innovative 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, 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 and better understand the factors influencing the sending and receiving decisions in a given fostering exchange. 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 child fostering. Third, with the help of two Burkinabe researchers, I organized a field enumerator training session that lasted three weeks. Part of the training focused on teaching the enumerators how to offer suggestions for improving the survey instrument throughout the data collection period. This training session was part of a larger iterative approach to the fieldwork process (for details, see Udry, 2003).[11]

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.[12] Within each compound, an enumerator individually interviewed the head of every household and then separately interviewed all of his wives (if applicable).[13]

[11] I also implemented a system of double data entry using computer programs to compare the two entries. A data entry supervisor, several research assistants, and I then checked the original questionnaire to correct these errors.

[12] In order to increase the number of households in the sample that had made a fostering decision, 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 during the past three years. 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.

[13] To determine how to assign every individual living in the compound to a specific household, enumerators followed these guidelines. The head of the compound and his wives constituted the first household. Any other individuals, not yet assigned to a household, that were still married as of 12/31/00 (the ending date for the three year survey period) would constitute additional households with his wives. Any other remaining individuals, not yet assigned to a household in the compound, who had once been married and whose marital status (widowed, divorced, separated) changed during the three year survey period would constitute an additional household. Other remaining individuals in the compound, not yet accounted for, who had once been married and whose marital status changed before 1/1/98 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 other remaining individuals in the compound, not yet accounted for, who have

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 during the previous three years 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 the age of five, children are expected to become economically helpful to the family, undertaking tasks in the household, in the fields, and in the market place. It is at this point that 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 particular 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 the women are of an acceptable age for marriage. In addition, for older children, it becomes difficult to disentangle what is a case of 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 Cote d'Ivoire eight hundred miles away, and six percent were

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.

scattered across the other provinces of Burkina Faso. In total, there were 316 paired households to be found in the second phase of surveying, and the field enumerators and I were able to find 300 of these households (a 94.9 percent success rate).[14]

To test the hypothesis that network quality matters for the household level decision to foster a child, I designed the survey to collect detailed information on several dimensions about the households that could be involved in sending or receiving a child. The survey includes information on network members' characteristics, such as their occupation, marital status, education, the number of their children currently enrolled in school, relationship to the respondent, and their household demographics including the number of boys and girls age zero to five, six to ten, and eleven to fifteen.

The network space that a household could potentially foster a child to is virtually limitless. Any other household is a potential receiver or sender. However, for two reasons, I limit these detailed 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, I found that a large proportion of child fostering occurs between immediate family members. After the survey, it turned out that sixty-two percent of all foster children in the sample were sent to or received from immediate family members. Second, it became obvious during the pre-testing of the survey instrument that the respondents were unable to answer questions about network member's characteristics in a timely manner if the questions pertained to individuals other than immediate family members, such as distant relatives, friends, or acquaintances.

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.

How households react to changes in their economic environment is inherently a dynamic process,

[14]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 where the child left the rural 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 that 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.

so I adopted a data collection strategy that entailed gathering retrospective information covering the three years prior to the survey interview. In addition to information about network members, the data contain detailed questions about agricultural production for every crop the household grew during each of three years (1998, 1999, and 2000). There is also information about each biological child in the respondent's household and, if the child was sent out at any time, questions are asked determining the relationship between the sending and receiving households, the timing of the fostering, and the location of the receiving household.

4 Empirical Results

Based on the theoretical model 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 out 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. To test the Pareto efficient model, in Section 4.3, I examine whether the factors that influence the sending decision influence the receiving decision in an equal and opposite way. I am able to reject the Pareto efficient model for child fostering.

4.1 Household Sending Decision

The first step in analyzing the household sending decision is determining how to measure network quality. I begin by trying to understand, 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 of a given network member being selected to receive a child. Both models include as explanatory variables the network member's characteristics and the joint characteristics of the 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 then calculate, for every household in the sample (including those households that did not foster children), two alternative network quality measures. The first is an ad hoc, intuitive measure that attempts to capture two dimensions of the network's quality,

occupational status and relationship to the respondent, that seem to impact the fostering decision. For the second measure, using the estimated coefficients from the household fixed effects logit regression, I calculate, for every network member linked to a given household, the predicted probability that the network member would be selected to receive a foster child, if one were sent. The household's network quality is then the percentage of the household's network members whose predicted probability 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 model. 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.

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 must restrict the data to only those households that sent children to immediate family network members during the three year time period. I make this restriction because in the analysis, I use the information about the network members who potentially could have been selected to receive a foster child but were not. Each immediate family member linked with a sending household is an observation in the restricted dataset, totalling 2364 observations.[15] Appendix Table 2 contains summary statistics for some of the variables used in the network member selection regression.[16]

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

[15]The sending households are drawn from both survey phases. Specifically, all sending households identified in Phase 1 are included in the sample. Also included are the sending households from Phase 2, which were identified via their link with Phase 1 receivers.

[16]Immediate family data include information on both the mother and father of the respondent. However, for this analysis, the mother's observation is omitted if the father is still alive and the parents are co-resident in order to prevent double counting that household.

different yields a $\chi^2(3)$ test statistic of 87.7 and a corresponding p-value of zero.

Table 2 shows that a higher percentage of immediate family members whose occupation is business are selected to receive a child when compared to immediate family members who are retired, unemployed, or housewives. Of the 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. The likelihood ratio test that the occupation categories are significantly different yields a $\chi^2(6)$ test statistic of 10.2. The corresponding p-value of 0.12 is not quite statistically significant.

4.1.2 Logit specification for estimating network member selection

I estimate the network member selection regression first using a binary logit model and then using a household level fixed effects logit. 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 a value of 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 about the particular match of 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 enrolled in school, whether the network member's household had a birth during the previous three years, and variables measuring the age and gender distribution of the children of the network member. Variables that attempt to capture what is unique about the match between these two potential foster households include age and gender indicators for the child being sent and interactions of age and gender dummies for the child sent out with age and gender dummies for the network member's children.

Results for the logit regression in Table 3, column 1 show that characteristics of a given network member and the complementarity of the match between the two potential exchanging households affect the probability of that network member being selected to receive a foster child. The regression provides preliminary evidence that the sending household is attempting to find for their child the

best receiving household. If the network member has a good occupation, such as being a business person, a bureaucrat, or even a manual laborer, 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.[17]

In addition, if the network member is either the parent or an adult child of the respondent, then that member is more likely to receive a child compared with 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 when compared to someone that has been 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. The results for these individual characteristic variables 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 an explanation for sending a child and some of the sociological literature argues that sending households often look for the most educated network member to receive their child. If the network member is educated, he is more likely to realize the importance of education and keep the foster child in school. Similarly, the sending household might look to find a network member that lives close to a primary school to ensure their own child's schooling. However, while the coefficient on the variable indicating whether the network member attended school is positive, it is not statistically different from zero. In addition, the variable indicating whether the network member's own children are currently enrolled in school is not significant.

Sociologists have argued that having no children, a limited number of children, or too few children of a particular gender are situations where households might attempt to receive a child to make up for these shortcomings (Lallemand, 1980; Jonckers, 1997). Results from this regression

[17]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: $\frac{\partial P(x)}{\partial x_i} = \frac{exp(\widehat{\beta_0^{logit}} + \overline{X_{cm}}\widehat{\beta^{logit}})}{[1+exp(\widehat{\beta_0^{logit}} + \overline{X_{cm}}\widehat{\beta^{logit}})]^2}\widehat{\beta^{logit}}$

indicate that the demographics of the network members' children matter for the receiving decision. Network members that have boys aged zero to five and six to ten are significantly less likely to be selected to receive a child. The variables indicating whether the network member had a baby are negative, but they are not significantly different from zero and do not appear to influence the probability that the network member is selected.

With respect to the variables describing joint characteristics about a particular match of two potential foster households, the results suggest that sending households are more likely to choose network members whose children have different age and gender characteristics from the child being sent. This implies first that the regression 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 being sent, and second that 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 being sent. It must be noted that because the number of households that are selected and that 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, these coefficients qualitatively support the above description, but in few cases are the coefficients statistically significant.

4.1.3 Household level fixed effects logit for estimating network member selection

It is likely there are certain unobserved factors unique to a sending household and its network where the child could be sent. 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 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 level 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. Furthermore, 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 level fixed effects logit are presented in Table 3, column 2. Coefficient estimates and standard errors are similar to the results from the logit regression. It is still the case that network members who have a good occupation, closer direct blood ties with the sending household, and a long-term, stable marital situation are 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 describing the network member's household demographics and whether the network member had a baby during the previous three years are similar in both specifications. Analogous results are seen when comparing the coefficients for the terms interacting a network member's demographics with the age and gender of the foster child.

Despite the coefficient estimates and the standard errors being similar, it is necessary to test whether there is unobserved heterogeneity in the model by using a likelihood ratio test to compare the fixed effects logit and the logit specifications. Under the null hypothesis of homogeneity, Chamberlain's conditional fixed effects logit and the maximum likelihood 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 $2(L_{HouseholdFELogit} - L_{Logit})$ where $L_{HouseholdFELogit}$ is the log likelihood for the fixed effects logit model and L_{Logit} is the log likelihood for the logit specification. The test statistic is distributed $\chi^2(44)$ with a critical value at the five percent level equal to 60.48. The log likelihood values in Table 3 yield a test statistic of 307.7, meaning I can reject the null hypothesis of homogeneity. Given that the fixed effects logit provides a better fit to the data, I use that model in the following network quality analysis.

4.1.4 Measuring network quality

Using the information about which characteristics play a role in the selection of a particular network member to receive a foster child, I calculate two alternative network quality measures. These measures are calculated for every household in the sample, regardless of whether it fostered children. The first measure is an ad hoc, intuitive measure 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, both of which seem to influence the receiving decision.[18] Households that have network members that are business people and members who are either parents or adult children would be considered as having 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 to receive a child. Table 4 shows that fifty-four percent of households have a good network as measured in this manner. While this network quality measure is intuitive and draws on the cross tabulations presented earlier, it obviously ignores many of the dimensions about the network's quality, particularly, the other variables discussed in Table 3 for the network member selection regression.

The second network quality measure incorporates these other dimensions, in addition to building on recent research in sociology 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. For example, a household with four eligible children and ten immediate family network members would contain forty observations in the dataset. I then use the estimated coefficients from the household fixed effects logit regression to calculate $X\widehat{\beta}_{FELogit}$, the predicted probability that the network member would be selected to receive a foster child, if a child were sent. This predicted probability is based on that member's characteristics and the joint characteristics of the match between the member and the foster child. Given this is an out-of-sample prediction, note that in most cases the child was never sent to any network member and this exercise is only estimating the probability the network member would be selected had the child been sent.[19]

The second network quality measure is based on the idea that, for a given fostering to occur, the sending household only needs one household to receive the child. Therefore, it is logical to focus on trying to measure something about the right tail of the distribution of predicted probabilities. Intuitively, if the sending household has a larger share of network members with high predicted

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

[19] 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.

probabilities, then it is more likely to find a household in its network that can receive a child.

This second measure is calculated as the household's percentage of network members who have a predicted probability of being selected that lies above the 80th percentile. I chose 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.[20] In calculating this percentage of network members above the 80th percentile, several intermediate steps were needed. Each network member has a predicted probability of being selected to receive a given child from the potential sending household, and if the household has several children, a given network member will have multiple predicted probabilities (one for each child). For a particular network member, it is possible that the predicted probabilities related to some children are above the 80th percentile and some are below. I consider a network member a good member if he has a predicted probability above the threshold for any child in the potential sending household.[21] On average, households have thirteen network members, and 29.2% of network members in a household's network are good quality.

Table 5 presents a simple tabulation of the percentage of households that either sent or did not send a child in a given year broken down by whether they have above or below the median network quality percentage measure. The median percentage of good network members above the 80th percentile is twenty-six percent. Households that have more than the median percentage of good members in their network constitute only 48.1% of households that did not send a child in a given year, but 65.0% 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 model, there are several distinct covariates that need to be examined to understand the household decision to send a child in a given year. The first incorporates the

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

[21]Similar results are obtained using an alternative intermediate step where each network member is no longer considered solely as a good member or not. In this alternative, a network member is considered a good member 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, then he would be assigned the value of one.

network quality measures developed in the preceding section. In the various regression specifications estimating the household's sending decision, I separately include each of the network quality measures previously explained to measure if households with a higher percentage of good quality network members are more likely to send out a child.

The second set of covariates builds on the hypotheses discussed in sociological, demographic and economic research 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 farmers, their economic environment and relevant crises are best captured by measures of their agricultural shocks. To calculate a household level 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?". In order to help the respondent answer the question, the field 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.[22] Based on this measure, the average household shock across all crops for the three years is equal to 1.90.

The third set of covariates incorporates demographic research that argues that fostering is a response to a demographic imbalance in a given household (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

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

shocks, and household demographics for household i in village v at time t.[23]

An overview of the logit results shows that 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. The summary statistics for the variables used in the household sending regression are in Table 4. 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 uses 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 a household's percentage of good network members by one percent 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. These results are significantly different from zero at the ten percent level. The sociology literature's emphasis on network quality as a factor influencing a household's decision making is confirmed by these results. In addition, the magnitude of the effect due to network quality is large. With current levels of household sending at eleven percent, 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 in this dataset is for three years

[23]Using a logit specification does not utilize all of the information present in the dependent variable for those households that have sent multiple children in a given year. To capture this information, I also estimate the household sending decision using an ordered logit, where the dependent variable takes the value for the number of children sent by the household in a given year. However, 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. Given the small number of household-year observations with multiple children being sent in a given year, the coefficient estimates and standard errors are similar to the logit specification discussed below.

(at time t, time $t-1$, and time $t-2$). The coefficients on the one and two period lagged shocks are negative and smaller, and they are not significantly different from zero. This suggests that households that had a larger shock prior to the current period are less likely to send a child this period because they have already dealt with the effect of the shock.[24] The agricultural shocks' results imply that households use fostering as a risk-coping mechanism to deal with adverse economic crises.

Analyzing the variables measuring the household's demographics shows that households with more girls aged five to fifteen have 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 variable for older girls is statistically significant at the one percent level, while the variable for younger girls is significant at the ten percent level. Having additional young boys or girls aged zero to four reduces the probability of sending a child, which is consistent with the explanation that children aged five to fifteen are needed for child care for their younger siblings. However, the coefficients are not statistically significant. In general, the results for the demographic variables are consistent with the demographic literature that argues that households use fostering to cope with demographic imbalances and are more likely to send out a child if they have a redundancy of children in a particular age and gender category.[25]

Table 7 presents results from logit regressions, similar to those in Table 6, but that include different measures of the household's wealth. Results for network quality, shocks, and household demographics are robust to including these different wealth measures. The household wealth variable in column 1 is measured as the value of the household's livestock and assets.[26] Column 2

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

[25]Examining the two sub-cases discussed in the theoretical model, I attempt to disentangle the consumption smoothing and labor productivity motivations for child fostering. In all of the regressions previously discussed, children are considered eligible to be fostered if they are between five and fifteen inclusive, but there are also a small number of younger children who are fostered. 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 still 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 driving motivation behind household sending.

[26]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 worth across individuals, the value of each asset as reported by the respondent is used to measure total asset value.

presents a measure of the household's permanent income that is 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 instruments.[27] Results for the three different household wealth measures indicate that the 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.[28]

All logit regressions in Tables 6 and 7 also include village dummies to capture any 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 model, 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 evidence supporting this aspect of the theoretical model. The analysis for the receiving decision 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 of a given network member's child being received based on the network member's characteristics and the joint characteristics of the match. Results show that relationship and marital status are still important indicators for selecting a given network member's child, but occupation is no longer significant. Using those 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, receiving network quality, and household demographics. None of the variables are statistically significant, with the one exception being the number of older girls, which

[27]The instruments include number of wives for 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.

[28]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.

has an unexpected, positive coefficient. I also estimate the receiving decision as a function of shocks, network quality, demographics, and household wealth, and I find that richer households are significantly more likely to receive a child in a given year.

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 during the three year survey period. Each child aged five to fifteen in an immediate family member's household is linked with a receiving household and forms an observation in the restricted dataset. There are 1771 such observations.

Table 8 presents the results from logit and household fixed effects logit regressions estimating the probability of a network member's child being received. None of the occupation indicator variables are statistically significant. This is consistent with the finding in Table 7 that the sender's wealth is not an important determinant of the sending decision. If the network member is the parent or adult child of the respondent, 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, where 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 out 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 the results are not statistically strong.

Replicating the sending household network quality analysis, I construct a similar receiving household network quality measure. For every household in the sample, even if it did not foster a child, I link it with every eligible child aged five to fifteen in its immediate family members' households. Using the estimated coefficients from the household fixed effects logit regression, I calculate the predicted probability 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 probability of being selected that lies above the 80th percentile.

In Table 9, I present the marginal effects from a household level logit regression estimating the

probability of a household receiving 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 four villages are dropped due to there being no receiving households in those villages.[29] The dependent variable, household receiving, takes a 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 show that, while the coefficient for household shocks is negative, meaning a household that experiences a worse shock is less likely to receive a child in a given year, the coefficient is not significant. 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 but also includes household wealth as an explanatory variable. 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, the senders are compared to a group of pooled households containing non-fostering and receiving households. In the receiving regression, the receivers are compared to a group of pooled households that now contain non-fostering and sending households. Tables 6 and 9 provide evidence that there is an asymmetry in the factors influencing sending and receiving households, but to test rigorously the theoretical model, I need to 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 7.7 percent of the observations have the value for receiving. To maintain consistency across regression specifications presented earlier, I use the 273-observation sample (based on the

[29]Recalculating the sending regression from Table 6 using the smaller 273-observation receiving sample does not change the earlier results, although the standard errors are larger (see Appendix Table 3 for these results).

358-observation sample in Table 6 with 4 villages dropped due to no receiving).

Analyzing the sending outcome in column 1 shows the results to be consistent with the earlier sending regression in Table 6. A one standard deviation increase in the household's shock increases the probability of sending a child by 3.3 percent. The network quality measure has a slightly smaller magnitude and larger standard error compared to Table 6 and is no longer significant. The demographic variables have similar results as before with households with additional girls aged five to fifteen more likely to send out a child. Column 2 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.

These results seem to indicate that the sending households are different than the non-fostering households, but that the receiving households, at least by these measures, are not statistically different than the non-fostering households. Calculating a likelihood ratio test of the joint restriction that the coefficients for shocks, network quality, and demographics 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. Based on these results, I reject the Pareto efficient model.

5 Conclusion

Given the potential welfare implications of child fostering and its widespread nature in much of Africa, it is critical to understand why households are engaged in this activity. This paper answers this research question of why households send and receive children using a unique dataset I collected during eighteen months of fieldwork in Burkina Faso. The research methodology that involved locating the sending and receiving households involved in each fostering exchange, combined with the survey instrument, make these data particularly appropriate for answering this question.

I present a theoretical model in which the allocation of children across households is Pareto efficient. This Pareto efficient 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. Households experiencing worse shocks are more likely to send a child, while households experiencing better shocks are more likely to receive a child. Second, a household is more likely to foster a child if it has better 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 empirically evaluate these three factors using the household survey data I collected, and I find that these three covariates significantly influence the household's decision to send a child, but not the decision to receive a child. 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 are able to explain the household's decision to receive a child in a given year.

One implication of this Pareto efficient 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. This test 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 age 5-10	-0.020*	0.003
	[0.011]	[0.034]
Girl Sent age 11-15	-0.017	0.011
	[0.011]	[0.036]
Boy Sent age 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 5-10, 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
Household Sending	0.11	0.32
Percentage of good network members	29.22	16.88
Ad hoc network quality	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	4.19	7.34
Household Permanent Income	1.29	1.65
Number of Boys 0-4	0.58	0.74
Number of Boys 5-10	0.88	0.89
Number of Boys 11-15	0.78	0.95
Number of Girls 0-4	0.65	0.73
Number of Girls 5-10	0.99	1.06
Number of Girls 11-15	0.68	0.84
Number of observations	358	

Note: 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 age 5-10	-0.054***	-0.077
	[0.021]	[0.031]
Girl sent age 11-15	0.016	0.030
	[0.016]	[0.028]
Boy sent age 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 5-10, 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 age 5-10	0.186	0.389
Girl Sent age 11-15	0.297	0.457
Boy Sent age 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.