Identifying non-cooperative behavior among spouses: Child outcomes in migrant-sending households ☆

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ABSTRACT

I propose a model of household decision-making under asymmetric information and show that resulting allocations may not be fully cooperative. The model yields a simple test for cooperative decision-making, which I apply to data from China. I find that, when the father migrates without his family, children spend more time in household production, while mothers spend less time in both household production and income-generating activities. This is not consistent with standard cooperative models of the household: simply reallocating time to compensate for the father's absence would cause an increase in household labor for both children and mothers and, if migration occurs in response to a negative shock, we should observe an increase in mothers' time in income-generating activities rather than a reduction. The results also do not appear to be driven by an increase in mothers' bargaining power, as children's human capital is not affected by migration, controlling for income.

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1. Introduction

Economic studies of the household have increasingly moved toward collective models in which decision-makers have heterogeneous preferences, and thus both the value and the ownership of income streams are important. When household members bargain over decisions and control over resources affects their allocation, we must consider whether and how individuals may behave strategically in order to increase their own utility. I examine an information problem that permits an individual to conceal expenditures and/or allocations from his/her spouse. This may lead to non-cooperative behavior, as intra-household allocations can only be coordinated to the extent that they can be enforced. Migration presents a clear opportunity for such behavior: the migrant has limited ability to observe expenditure and allocation decisions made by the spouse

remaining at home but may also be able to conceal his own expenditures by determining the amount of money that will be remitted to the household.

The economic literature on the impact of remittances on migrant-sending households (see Yang, 2011 for a survey) has largely neglected a key feature of such income: the difficulty inherent in monitoring the disbursement and allocation of remittances (for exceptions, see Ashraf et al., 2011; Chami et al., 2003; Chen, 2006). With rising trends in both rural-urban and international migration, it is essential to understand the implications of such an information problem in order to assess the ultimate impact on origin households and communities. The existence of non-cooperative behavior among household members would suggest that expanding opportunities for migration will have different effects than simply increasing the amount of income received by the household. Non-cooperative behavior would also have important implications for policy and program design because it implies that the channel through which income is received can have important spillover effects. For example, direct subsidies are easily observed by other household members, whereas the proceeds of micro-credit enterprises could be concealed and used to finance expenditures that otherwise would not be undertaken.

I introduce asymmetric information into a model of household decision-making such that the migrant has imperfect information about the actions taken by his spouse. If the migrant also has incomplete information about his spouse's preferences, it is possible to have an equilibrium in which the migrant behaves cooperatively but his

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spouse does not. If the migrant does have complete information about his spouse's preferences, he can design a fully incentive-compatible contract to elicit cooperative behavior, but intra-household allocations will still shift in favor of the non-migrant, who has the advantage of complete and perfect information. Data are drawn from the China Health and Nutrition Survey (CHNS). The panel aspect of these data allow me to account for both unobservable child and household fixed effects as well as time-varying local economic shocks that may be correlated with the migration decision. Because data on the migrant's remittances and private expenditures are not available, the potential for non-cooperative behavior on the part of the migrant is left to future research.

Results indicate that non-cooperative behavior, whether realized or simply invoked as a threat, affects intra-household allocations in a surprising way. Children's schooling and health exhibit no significant change with the father's migration, controlling for income. This is not consistent with a case in which migration increases mother's bargaining power, given existing evidence that mothers tend to invest more heavily in these goods. In contrast, time spent in household chores does change; girls engage in more housework while mothers reduce their time in both housework and income-generating activities. The *simultaneous* increase in child labor and reduction in mother's labor cannot be explained with a cooperative model of household decision-making: as long as fathers derive (weakly) greater disutility from child labor than from mothers' labor, their absence from the household should not lead to an increase in child labor without an accompanying increase in mother's household labor. Moreover, this pattern is not evident among households in which the migrant happens to be home at the time of the survey, which suggests that it is the physical absence of the father – and not self-selection into migration – that is driving the results.

The following section presents a framework for modeling the effect of migration on intra-household allocation and compares equilibria with and without asymmetric information. Section 3 describes the key empirical distinctions between cooperative and non-cooperative formulations of the model and shows that the data are inconsistent with standard cooperative models of the household. Several robustness checks are provided in Section 4 to ensure that the results are not driven by the assumptions of the model or the limitations of the empirical strategy, and Section 5 concludes.

2. Migration with asymmetric information

Migration introduces imperfect information, increasing transaction costs associated with enforcing cooperative bargaining agreements. In some cases, the cooperative outcome may become unsustainable, as evidenced by a growing body of literature. Dubois and Ligon (2004) find that, where there is asymmetric information about activities, the allocation of calories among household members is used both to create incentives for individuals and as a form of investment. Ashraf (2009) finds that, in an experimental setting, spouses attempt to conceal expenditures from each other when presented with the opportunity, and de Laat (2005) finds that migrants living in Nairobi invest in costly monitoring technologies to mitigate moral hazard on the part of their spouses in rural villages. Recent work by Ashraf et al. (2011) and Chin et al. (2011) suggest that migrants are concerned about the degree of control they possess over remittances, providing indirect evidence of information asymmetries and non-cooperation. Improving migrants' control (reducing the potential for non-cooperative behavior) is found to increase savings and income, suggesting improvements in both static and dynamic efficiency.

Lundberg and Pollak (1993) provide the first theoretical framework for non-cooperative behavior within marriage. In a non-cooperative equilibrium, individuals do not coordinate their actions or pool their resources. Rather, each spouse maximizes his/her own welfare, given the behavior of his/her spouse. Warr, 1983 and Bergstrom et

al., 1986 show that, when all players make strictly positive contributions, control over resources will not affect provision of the public good or the equilibrium utilities of the individuals, even if the individuals do not coordinate. However, if the provision of household public goods is organized along "separate spheres", as in Lundberg and Pollak (1993), such that at least one spouse makes zero contributions to some public good, control over resources and the degree of cooperation will affect the equilibrium outcome.[1] Migration gives the non-migrant spouse de facto control over the provision of all household public goods, essentially forcing allocations into separate spheres.

Here, intra-household allocation is modeled as a contracting problem, allowing for both incomplete and imperfect information. Note that, although cooperative equilibria exist, the model is non-cooperative in nature. Because the CHNS provides data only on sending households, I consider only imperfect monitoring of the non-migrant's actions. A more complete dynamic model in which wives update beliefs about husbands' wage realizations is left to future research.

2.1. Description of game

Consider a household with two adults, a migrant (m) and a non-migrant (n), and one child (k). Adults may engage in wage and household labor, while children engage only in household labor. Each adult has preferences over own private consumption (x_i), own labor (t_i), child labor (t_k) and child quality (z). For ease of notation, I allow time spent in productive activities (wage and household) to provide some disutility, rather than specifying a utility of leisure.

$$U_i(x_i, t_i, t_k, z) \text{ with } t_i = t_i^w + t_i^h \text{ for } i = m, n. \tag{1}$$

Note that, for simplicity, I have assumed that neither the migrant nor the non-migrant cares about the labor hours of his/her spouse. However, the theoretical implications discussed below will hold as long as each adult cares more about the child's labor than about his/her spouse's labor.[2] Child quality is produced with a household good (y), and child labor detracts from child quality.

$$z = \tilde{z}(y, t_k) \tag{2}$$

The household good, in turn, is produced with child and adult household labor according to person-specific productivities (τ)

$$y = y\left(t_m^h, t_n^h, t_k; \tau_m, \tau_n, \tau_k\right). \tag{3}$$

For simplicity, we can then rewrite the production function for child quality as

$$z = z\left(t_k, t_m^h, t_n^h; \tau_m, \tau_n, \tau_k\right). \tag{4}$$

Note, however, that $\partial z / \partial t_k$ is not strictly the marginal product of child labor for child quality; rather, it reflects both the negative effect of own labor on child quality and the offsetting positive effect via production of the household good. To close the model, I assume that total private consumption must be equal to total earnings

$$x_m + x_n = w_m t_m^w + w_n t_n^w. \tag{5}$$

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[1] This holds as long as spouses face different implicit prices, even if both make positive contributions.

[2] This assumption has strong foundations in Hamilton's (1964) rule, which suggests that altruism is a function of genetic preservation. Because parents and children share a large amount of genetic material while spouses share none, each parent should be willing to sacrifice his/her spouse for their shared child, in order to preserve a greater proportion of the parent's own genetic material. See Cox (2007) for additional discussion of Hamilton's rule in economic models of the household.