FCND DISCUSSION PAPER NO. 3

THE EXTENDED FAMILY AND INTRAHOUSEHOLD ALLOCATION: INHERITANCE AND INVESTMENTS IN CHILDREN IN THE RURAL PHILIPPINES

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March 1995

ABSTRACT

This paper examines the role of the extended family on investments in children, using data from a retrospective survey of three generations in the rural Philippines. Econometric results show that interactions between grandparent characteristics and child gender significantly affect the distribution of proposed land bequests between sons and daughters. However, grandparents significantly affect gender-specific investments in children's education only in resource-constrained families. Family-specific effects are more important in determining the pattern of investment in children within the nuclear family, while individual heterogeneity rather than family-specific unobservables dominates the extended family results. Interactions between parent characteristics and child gender are important determinants of both land transfers to, and educational investments in, children. Sons are clearly favored in terms of land inheritance, although daughters of better educated fathers, and with better educated grandfathers, may also have an advantage. The secular expansion of education has contributed much to the increased educational attainment of women. Better educated fathers favor daughters in terms of education, while mothers with more land favor sons. These patterns are consistent with both equity and efficiency objectives, investment in children under resource constraints, and parents' risk-diversification strategies.

CONTENTS

THE EXTENDED FAMILY AND INTRAHOUSEHOLD ALLOCATION: INHERITANCE AND INVESTMENTS IN CHILDREN IN THE RURAL PHILIPPINES*

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1. INTRODUCTION

Investment in children has important implications for intergenerational mobility. Inherited wealth may affect inequality of future generations, depending on the effect of bequests on lifetime wealth accumulation (Deolalikar and Singh 1990). Family background, through its influence on educational attainment, affects future incomes of children. If parents make gender-specific investments in children (Thomas 1990, 1994; Schoeni, Strauss, and Thomas 1994), parental preferences between sons and daughters would also have implications on the relative intergenerational mobility of men and women.

This process may be influenced by the extended family in many societies. The extended family plays an important role in risk-sharing and consumption smoothing in

* The survey data were gathered as part of the Rockefeller Foundation-funded research program on "Gender, the Family, and Technical Change in Low-Income Countries" at the Economic Growth Center, Yale University, with the cooperation of the International Rice Research Institute. I would like to thank Howdy Bouis, Lynn Brown, Lawrence Haddad, Kei Otsuka, Christine Pena, and Junsen Zhang for valuable comments. I am also grateful to Leah Gutierrez, Jyotsna Jalan, and seminar participants at the International Food Policy Research Institute for helpful discussions, and to Benjamin Crow for typing the tables. I am responsible for all errors and omissions.

economies with imperfect asset markets.[1] This paper investigates another aspect of the extended family, namely, its influence on intergenerational transfers, using an example from the rural Philippines. In this paper, "extended family" refers to functionally extended families of several generations, regardless of whether or not the elderly reside with adult children and grandchildren. In the Philippines, because children are encouraged to form separate households after marriage, intergenerational extension is more common than lateral extension. Elderly parents do not usually live exclusively with one child, but rotate among their children.

A substantial literature already exists on parents' motives for intergenerational transfers (Becker 1974; Becker and Tomes 1986; Behrman, Pollak, and Taubman 1982; Cox 1987). The role of intergenerational extension in transfer behavior is much less studied. Rosenzweig and Wolpin (1985) have argued that in traditional production environments with stationary risk, the presence of elder family members permits heirs to capture returns to specific experience. Moreover, while coresidence of siblings has no effect on farm profits, the presence of elder family members with more experience has a positive impact—presumably because siblings would not have the experiential advantage that older members have. Other studies have examined the role of parental—including

[1] Tests of the role of the extended family have revolved around its ability to smooth consumption and the relationship between parent and child earnings. For example, in the United States, Altonji, Hayashi, and Kotlikoff (1992) find that extended family resources have only a modest effect on household consumption after controlling for their ability to predict a household's permanent income. In contrast, Rosenzweig (1988), using transfer data, and Townsend (1994), using consumption data, find significant evidence for risk pooling within Indian villages. The divergence of findings suggests substantial differences in asset and insurance markets in these economies.

grandparents'—background on current educational outcomes in Brazil (Schoeni, Strauss, and Thomas 1994), Malaysia (Lillard and Willis 1994), and Nepal (Jamison and Lockheed 1987).

In the Philippines, bilateral extension, multilineal descent, and the respect given to the elderly give grandparents of both spouses substantial influence on family decisions (Lopez 1991; Medina 1991).[2] Even if grandparents do not reside with their children, they are consulted on family matters, and may even override parental decisions. In the rural Philippines, where children are given a plot of land from the family holding upon marriage, nuclear families of siblings would live in close proximity to the grandparents. The influence of earlier generations on the choice of heirs, and the forms of wealth transferred to them, may have profound implications on the intrahousehold distribution of wealth and intergenerational mobility.

This paper uses data from a retrospective survey of three generations in the rural Philippines to study the role of the extended family on investments in children. It provides econometric evidence on the degree to which wealth and schooling levels of parents and grandparents interact with child characteristics, especially gender, and affect investments in children's human capital and wealth transfers to them. It examines the importance of the extended family on investments in children's education when families face different resource constraints. These results are used to interpret the role of land in rural inheritance and the secular increase in women's education in the Philippines.

[2] Bilateral kinship in Filipino families means that the individual at birth is affiliated with both paternal and maternal groups of relatives. Since descent lines are reckoned through ascending generations on both sides, the descent system is multilineal.

Econometric results show that family-specific effects are more important in determining the pattern of investment in children within the nuclear family, while individual heterogeneity rather than family-specific unobservables dominates the extended family results. Interactions between parent characteristics and child gender are important determinants of both land transfers to, and educational investments in, children. Grandparent interactions with child gender also influence the distribution of proposed land bequests between sons and daughters. However, grandparent interactions with child gender significantly affect educational outcomes only among poorer families. Sons are clearly favored in terms of land inheritance, although daughters of better educated fathers, and with better educated grandfathers, may also have an advantage. Although daughters may achieve higher mean levels of education—and, in fact, are favored when interactions with parent or grandparent characteristics are not considered, the secular expansion of education has contributed much to the increased educational attainment of women. Better educated fathers also favor daughters in terms of education. Mothers with more land, however, tend to favor sons.

2. PARENTAL PREFERENCES AND INTERGENERATIONAL MOBILITY

A MODEL OF INTERGENERATIONAL WEALTH TRANSMISSION

To what extent does family background affect investment in future generations? In the wealth model of the family (Becker and Tomes 1986), adult earnings, Y_t, depend on human capital, H, and market luck, l, where adult human capital is determined by endowments, E, inherited from parents and by parental (x) and public expenditures (s) on his or her development.

$$Y_t = \alpha H_t + l_t \tag{1}$$

where

$$H_t = ß(x_{t-1}, s_{t-1}, E_t) \text{ with } ß_j > 0,\ j = x, s, E\ . \tag{2}$$

If capital markets are perfect, altruistic parents borrow to maximize the net incomes (earnings less debt) of their children. They make expenditures on their children's human capital to equate the marginal rate of return on human capital to the interest rate, r_t, such that the optimal expenditure on children's human capital is given by:

$$x^*_{t-1} = g(E_t, s_{t-1}, r_t). \tag{3}$$

Since parents can borrow to finance their children's education, and debt can be passed on to children, parent's income does not affect educational expenditure. Differences in educational investment across children in the same family would arise only from variations in the returns to education for each child, due to differences in innate ability. Having invested to maximize the joint wealth of the family line, parents then use bequests (transfers) to equalize incomes across children.

However, if asset markets are imperfect, parents may not be able to finance educational investment by borrowing. They may therefore be forced to reduce their own consumption, liquidate some of their assets, or choose among children (Behrman, Pollak, and Taubman 1992). In the extreme, in societies with limited mobility, or with resource scarcity, parents may invest the family's resources in the child with the greatest probability of success, as in traditions of unigeniture (Chu 1991).[3] Thus, when parental resources are limited, and asset markets are imperfect, expenditures on children would depend not only on endowments of children and public expenditure, but also on earnings of parents, Y_{t-1}, their generosity towards children (and towards specific children in the sibset), and the uncertainty or luck of children, ϵ_t. Thus, expenditures on children would be given by

$$x^*_{t-1} = g^*(E_t, s_{t-1}, Y_{t-1}, \epsilon_t). \tag{4}$$

Substituting Y_{t-1} for Y_t in equations (1) and (4),

$$Y_{t-1} = \alpha H_{t-1} + l_{t-1},$$

and, for simplicity, setting $\alpha = 1$,

$$= ß(x^*_{t-2}, s_{t-2}, E_{t-1}) + l_{t-1}\ . \tag{5}$$

That is, parents' income is determined by grandparents' and public expenditures in the past, their own endowments, and luck. Substituting equation (5) for Y_{t-1} in equation (4),

$$x^*_{t-1} = g^*(E_t, s_{t-1}, ß(x^*_{t-2}, s_{t-2}, E_{t-1}, \epsilon_{t-1}) + l_{t-1}, \epsilon_t) \tag{6}$$

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[3] Strictly speaking, Chu (1991) discusses the practice of primogeniture; but across different societies, unigeniture describes more accurately the bestowal of wealth to one heir. Among the Ilocanos in the Philippines, for example, land may be used to finance the elder children's education and work abroad, leaving it to be inherited by the youngest child (Lopez 1991).

and, again, substituting for x^*_{t-2},

$$x^*_{t-1} = g^*(E_t, s_{t-1}, ß(g^*(E_{t-1}, s_{t-2}, Y_{t-2}, \epsilon_{t-1})\, s_{t-2}, E_{t-1}, \epsilon_{t-1}) + l_{t-1}, \epsilon_t). \quad (7)$$

Thus, if asset markets are imperfect, grandparents' earnings, Y_{t-2}, will affect transfers to parents, and, in turn, transfers to children. Family background would therefore have a greater impact on investment in children in economies with imperfect asset markets and in families facing greater resource constraints. In Taiwan, for example, parental income variables and the size and gender composition of sibsets had stronger effects on educational attainments among persons born in earlier cohorts or from low-income households, than among later-born persons or wealthier families (Parish and Willis 1994).

PARENTAL ALLOCATION RULES AND INTERGENERATIONAL EXTENSION

Within each generation, parents may have different objectives that motivate transfers to children. Such decisions may be based on future returns that the children would bring (Rosenzweig 1986), preferences for intersibling equality (Behrman, Pollak, and Taubman 1982) or trade-offs between equity and efficiency (Pitt, Rosenzweig, and Hassan 1990; Haddad and Kanbur 1990; Quisumbing 1994). They may also be motivated by family heads' desire to preserve the family line (Chu 1991).

To illustrate conflicts between some of these objectives, suppose that parents make two types of transfers to their children, education, E, and land, L, to maximize the present discounted value of aggregate wealth (Figure 1). If child 1 is more efficient in generating income in education-intensive activities, due to greater ability or better employment prospects, parents would give more education to child 1. Conversely, if child 2 has a comparative advantage in using land, perhaps due to greater physical strength, parents would efficiently allocate more land to the second child. Actual transfers to child 1 and child 2 would then be unequal and would not lie on the 45-degree line.

However, the desirability of land versus education as a form of transfer would be affected by changes in the costs of schooling, or in relative returns to land and education. For example, the supply of schooling in the Philippines has increased with the expansion of public education in the 1960s. At the same time, the growth of nonagricultural employment opportunities and decreasing land sizes due to population pressure may have increased relative returns to education. The change in the costs of schooling would result in the child who had a comparative advantage in using education acquiring more human capital—resulting in the allocation (E1, L1)′ and (E2, L2)′.

The presence of elder family members complicates parental decisionmaking considerably. Within a nuclear family, spouses may not share a single utility function. If spouses disagree, the common preference model with a single parental utility function does not hold, and the outcome of the allocation is the result of bargaining

Figure 1—Allocation of land and education to child 1 and child 2 with a change in relative returns to land and education

between spouses (McElroy 1990; Chiappori 1988, 1992). Like other household allocation outcomes, intergenerational transfers may reflect individualistic preferences of husband and wife in household decisionmaking. However, within an intergenerationally extended family, grandparents may have different views from parents. When grandparents influence parental decisionmaking, outcomes will be affected by both intrahousehold and intergenerational bargaining. These considerations may be important in societies where families are intergenerationally extended, or where liquidity constraints and imperfect asset markets compel parents to turn to the extended family as a resource pool. The test of the impact of intergenerational extension would be a test of the significance of grandparent effects on allocations to grandchildren versus the significance of parental effects.[4]

THE MODEL AND EMPIRICAL SPECIFICATION

Consider an agricultural household with two adult members (parents). Parents decide on the desired number of children and levels of education and asset transfers to them. There are assumed individualistic preferences—the father and mother have their own utility functions—and individual stocks of human and physical wealth, which are predetermined at the time of marriage.[5] The demand for goods and leisure by parents, the desired number

[4] Similar tests of the effects of grandparents' education on grandchildren's schooling have been performed by Lillard and Willis (1994) for Malaysia and Schoeni, Strauss, and Thomas (1994) for Brazil.

[5] "Premarriage wealth" is used to denote human and physical capital not affected by allocation decisions within marriage. These are referred to as "parental characteristics" in subsequent discussions.

of children, and optimal levels of education and asset transfers to child i in family j are determined by solving the Hicksian demand functions simultaneously, given prices, p, human capital (E_f and E_m, for education of the father and mother, respectively), premarriage wealth (W_f, W_m), and fixed inputs, L. The fertility and child investment decision takes place in each generation— grandparents decide on the number of children in the parent generation, and transfers to them; parents make analogous decisions for their children.[6]

Due to the sequential nature of decisionmaking over the life cycle, later decisions may be based on previous decisions, plus the realization of "luck" or deviations from the expected outcome. This added error, or changes in the initial conditions, could lead to a revision of earlier goals within one generation, but could create endogeneity of outcomes across generations. Within the typical nuclear family life cycle, completed fertility is determined prior to the completion of investment in children's human capital; schooling may also be completed before the child's earning capacity is known (Tomes 1981). Given that, at the time bequests are made, parents' fertility is predetermined and human capital investment already precommitted, no adjustment of these choice variables may be possible, so material

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[6] This specification, which focuses on education and land transfers, departs from studies on intergenerational mobility that focus on the correlation between parents' and children's earnings (for example, Becker and Tomes 1986; Goldberger 1989; Solon 1992; Zimmerman 1992; Behrman and Taubman 1990). If parents' and children's earnings are highly correlated, income inequality is more likely to be transmitted across generations. Conversely, a low value of the correlation coefficient implies greater equality of opportunity and greater social mobility. This study examines transfers of physical and human capital (which are predictors of lifetime earnings) rather than current earnings, because of the difficulty of obtaining permanent income measures in this agricultural setting, and because limited convertibility of assets may strengthen the correlation between successive generations' wealth.

transfers will have to adjust if decisions are revised. However, in the intergenerationally extended family, parents' schooling and wealth levels will have been determined by grandparents' previous investments.

Thus, assume that grandparents g decide completed family size C^* in generation p (as in parents), using the rule

$$C^*_p = C^*_p(p, E_{gf}, E_{gm}, L_g, W_{gf}, W_{gm} ; \alpha_g), \tag{8}$$

where α_g is a generation-specific vector of other variables, such as parental tenure, irrigation, or location, and the subscripts, gf and gm, refer to the grandfather and grandmother, respectively. Educational investment in child i in generation p will then take into account the number of children C^*_p:

$$E^*_{ip} = E^*_{ip} (p, E_{gf}, E_{gm}, L_g, W_{gf}, W_{gm} ; \alpha_g, C^*_p) \tag{9}$$

and asset transfers, in turn, will be conditioned on the number of children, C^*_p, and previous investment in their human capital, E^*_{ip}:

$$A^*_{ip} = A^*_{ip} (p, E_{gf}, E_{gm}, L_g, W_{gf}, W_{gm} ; \alpha_g, C^*_p, E^*_{ip}). \tag{10}$$

In the next generation, generation c, an analogous process would result in the following:

$$C^*_c = C^*_c(p, E_{pf}, E_{pm}, L_p, W_{pf}, W_{pm} ; \alpha_p), \tag{11}$$

$$E^*_{ic} = E^*_{ic} (p, E_{pf}, E_{pm}, L_p, W_{pf}, W_{pm} ; \alpha_p, C^*_c), \tag{12}$$

$$A^*_{ic} = A^*_{ic} (p, E_{pf}, E_{pm}, L_p, W_{pf}, W_{pm} ; \alpha_p, C^*_c, E^*_{ic}), \tag{13}$$

where pm and pf index the father and mother in the parents' generation. However, note that

$$E_{pf} = E^*_{ip} (p, E_{gf}, E_{gm}, L_g, W_{gf}, W_{gm} ; \alpha_g, C^*_p),$$

and similarly for E_{pm}; and

$$W_{pf} = A^{*}_{ip}(p,\ E_{gf},\ E_{gm}, L_g, W_{gf}, W_{gm} ; \alpha_g, C^{*}_{p},\ E^{*}_{ip}),$$

and analogously for W_{pm}. Thus, equations (11) to (13) can be rewritten in terms of the grandparent human capital and premarriage wealth variables.

In practice, within the nuclear family, C^{*}_{j}, E^{*}_{ij}, and A^{*}_{ij} are all affected by the same unobservables, such as preferences, and could have common error components. Some of these family-specific unobservables could persist across generations in the same extended family. It is difficult to find variables that would affect some of the decisions exclusively in order to impose identifying restrictions. For example, spousal selection (Boulier and Rosenzweig 1984), child's marital status, and parental coresidence may be endogenous to individual characteristics and parent's previous investment in children, especially if strategic bequest motives exist (Bernheim, Schleifer, and Summers 1985). If one assumes that previous levels are predetermined and that errors are not correlated across equations, then the model can be estimated recursively. Alternatively, one can estimate reduced form equations and express family outcomes as a function mainly of parents' (or grandparents') characteristics at the time of marriage. The second method is used, but also includes a vector of child characteristics such as gender, birth year, dummies for the eldest child, and interactions between gender and birth order to model decisions within a nuclear family. To examine the effects of intergenerational extension, a reduced form equation is estimated with the characteristics of grandparents interacted with child variables, and test for the significance of the grandparent interactions.[7]

Thus, suppose parents can transfer wealth through human capital investment (education) and assets (usufruct rights, land ownership, or other assets), given previous decisions on the number of children. The reduced form equations are expressed as a function of parental endowments and child characteristics in the education and land transfer equations in the nuclear family equations. Education and wealth transfer decisions involve not only parental premarriage wealth but also its interaction with child characteristics. Let transfers to child i in family j be given by a vector:

$$T^*_{ij} = [E^*_{ij}, L^*_{ij}], \tag{14}$$

where E^*_{ij} and L^*_{ij} are levels of education and land. Within the nuclear family, these transfers can be specified as:

$$T^*_{ij} = ß_0 + ß_1X_{cij} + ß_2X_{fj} + ß_3X_{mj} + ß_4X_{fj}X_{cij} + ß_5X_{mj}X_{cij} + \epsilon_{ij}, \tag{15}$$

where $ß_k$ is a vector of coefficients ($ß_{ek}$, $ß_{lk}$, $ß_{ak}$) for each type of transfer (where e, l, and a index education, land, and asset transfers, respectively, and k refers to the regressors), X_c is a vector of child characteristics, such as gender, birth year, and dummies for the eldest or youngest child, X_f and X_m are vectors of parental human and physical wealth at the time of marriage, such as education and size of land owned or inherited. Individual landownership (or area of inherited land) is the indicator of individual asset positions,

[7] An alternative approach would have been to estimate a structural model in which parental characteristics are predicted, based on grandparent characteristics. However, it is difficult to find instruments with which to predict parental characteristics with the existing survey data.

because land cultivated exclusively by women is not common in the Philippines, but landownership and inheritance by women is widespread. $X_f X_c$ and $X_m X_c$ are interaction terms for child and parent characteristics and ϵ_{ij} is the error term in each equation. Birth year is an explanatory variable that accounts for possible time trends in environmental conditions, such as the availability of education and land reform implementation.[8] In the intergenerationally extended family, the specification becomes:

$$T^*_{ij} = ß_0 + ß_1 X_{cij} + ß_2 X_{gff} + ß_3 X_{gmf} + ß_4 X_{gff} X_{cij} + ß_5 X_{gmf} X_{cij} + ß_6 X_{gfm} + ß_7 X_{gmm} + ß_8 X_{gfm} X_{cij} + ß_9 X_{gmm} X_{cij} + \epsilon_{ij}, \tag{16}$$

where gff, gmf, gfm, and gmm index the premarriage human and physical capital of both sets of grandparents.[9]

Equations (15) and (16) do not adequately reveal sources of heterogeneity in transfer outcomes. Some of the heterogeneity may be due to individual unobservables, and part due to family-level variables that may influence the capacity of parents to accumulate wealth and transfer assets to their children. However, many of these family-specific variables are not observed. Should these omitted family-level variables be correlated with those included in the previous model, their estimated effects on transfers may be biased. For those families

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[8] The survey areas were covered by the 1972 land reform legislation for tenanted rice and corn land, with land reform more successfully implemented in irrigated and favorable rainfed areas. For details on land reform in the Philippines, see Hayami, Quisumbing, and Adriano (1990) and Otsuka (1991).

[9] The indices gff and gmf refer to the paternal grandfather and grandmother, while gfm and gmm index the maternal grandfather and grandmother.

with at least two children, the within-family allocation may be the critical source of variation in the sample from which to estimate gender differences in transfers.[10]

Suppose the observed transfer, T_{ij}, to child i in family j is given by:

$$T_{ij} = t_j + \beta X_{ij} + \epsilon_{ij}, \tag{17}$$

where the family-specific effect is a dummy variable, t_j, which is taken to be constant for a family. A fixed effects estimation procedure controls for these family-level unobservables, using family-specific dummy variables.[11] While variables that do not vary across children cannot be identified, their effects may be estimated to the extent that they impact differently on children of different gender. Thus, in this specific application, only the child's gender, birth year, eldest and youngest dummies, interaction between child gender and birth order, and interaction between child gender and parent (or grandparent) characteristics remain as explanatory variables in the fixed effects specification. However, this specification, while controlling for additive unobservables, does not consider interactions between observables and unobservables.

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[10] Families were chosen with at least two children above 18 years of age of both sexes so that birth order and gender dummies are relevant in the family fixed effects specification. The fixed effects procedure eliminates selectivity bias since selection into the sample is a family-specific variable (Heckman and MaCurdy 1980; Pitt and Rosenzweig 1990). It therefore controls for selectivity regarding family size and completion of bestowals to children. Age 18 is used as a cutoff so that children in the sample will have completed schooling. Other studies (Schoeni, Strauss, and Thomas 1994) estimate cohort-specific schooling attainment equations or express schooling as a deviation from the cohort mean (Jamison and Lockheed 1987).

[11] These family-specific dummy variables can be estimated, but this is not discussed here. An equivalent procedure is to estimate an equation where both dependent and independent variables are expressed as differences from their respective means; see Hsiao (1986, 29-31) for a more detailed exposition.

On the other hand, if transfers were affected by individual heterogeneity, the appropriate equation would be

$$T_{ij} = t + ßX_{ij} + u_i + \epsilon_{ij}, \tag{18}$$

where the individual-specific constant terms, u_i, are randomly distributed across families. The individual-specific terms (u_i) are not estimated directly but estimates of the variance components are used to compute the generalized least squares (GLS) estimator for the random effects model. A Lagrange multiplier statistic tests for the appropriateness of the random effects model compared to ordinary least squares (OLS) without group effects, while a Hausman test compares the random effects model to a fixed-effects specification.

3. EVIDENCE FROM THREE GENERATIONS IN THE RURAL PHILIPPINES

DATA

A retrospective survey of 344 households was conducted in five selected villages, which were randomly selected and intensively surveyed by the International Rice Research Institute (IRRI) in 1985. This study resurveyed the sample as it was initially surveyed by IRRI. The 1985 IRRI sample consisted of 300 farming households and 96 landless households; due to outmigration, the sample size was reduced to 344 as of 1989.[12] The retrospective survey included questions on the parents, siblings, and children of the respondents, yielding information on three generations, called the grandparents', parents' (respondents and siblings), and children's generations. The respondents were asked about

[12] No attempt was made to replace respondents because of the desire to match present respondents with previously collected records on family histories.

premarriage wealth (education and landownership) of their parents and in-laws, the education and inheritance of their spouses, and schooling and proposed bequests to their children.[13] Spouses were present during most of the interviews, facilitating collection of data on spouses' family background.[14] The survey permitted matching 265 sets of grandparents and parents with 707 children over 18.[15]

Parents expressed the intention to bestow land to a third of the children above 18. Almost 10 percent (9.6 percent) of the children came from families that had no land to give. Among families with land bequest intentions, responses on the ex ante land size are available for 639 grandchildren. The analysis which follows examines the education outcomes of the grandchild generation as a whole, stratified according to their parents' ability to make land

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[13] Responses regarding proposed (ex ante) land bequests to children for 90 percent of children above 18 years of age were obtained. Responses either consisted of a specific area (whether positive or zero) or a "no decision" response, which indicates that the parent had not decided on the specific size to bestow. Most parents in the subsample had already decided on specific sizes for children above 18. This excludes landless or nonagricultural families who had no land to bestow; thus, a value of zero means that the parent had no intention of giving land to a particular child, but may plan to bestow land to another. Information on ex post bequests were not relevant, since most of the grandchildren were still single and had not received land as part of the marriage bestowal.

[14] Wives of the predominantly male respondents usually answered the fertility and child schooling questions; questions on proposed bequests were answered jointly by husband and wife.

[15] Estimation was performed on the subset of 707 children for whom information was complete. Table 1 presents descriptive statistics for a larger sample of 801 children above 18.

bequests, and investigates in greater detail the inheritance and schooling decisions of the parents and grandparents of the 707 potential heirs.[16]

Two villages are located in Central Luzon, where the majority of the respondents are Ilocano, while three villages are in Panay Island, where the dominant ethnic group is Ilonggo. These villages are typical rice-growing villages in these regions, and the whole area is planted to rice during the wet season (June to December). Rice cultivation during the dry season depends on the availability of irrigation.

Table 1 presents a summary of education and land inheritance patterns of the grandparent, parent, and child generations.[17] In the grandparent generation, males' educational attainment was slightly higher than females', with 3.79 and 3.71 years of schooling for paternal and maternal grandfathers, respectively, compared to 3.35 and

[16] A full analysis of land and education trade-offs is possible only for those wealthier families with the potential to bestow land. However, an analysis of educational investment in the full grandchild sample will be more informative of general trends in schooling across three generations, since it will include both poorer and wealthier families.

[17] A previous study examined intrahousehold allocation within the respondent's family, using respondent recall of bestowals and education of siblings (Quisumbing 1994). In that study, the grandparent and parent (respondent) generations were referred to as the parent and respondent generations, respectively.

Table 1—Education, landholdings, and household characteristics of grandparent, parent, and child generations

Variable	Mean	Standard Deviation
Grandparent generation (265 households)[a]		
Average birth year	1909	38.82
Education (years of schooling)		
Paternal grandfather	3.79	3.37
Paternal grandmother	3.35	2.90
Maternal grandfather	3.71	3.19
Maternal grandmother	3.23	2.84
Land area owned (hectares)		
Paternal grandfather	1.44	3.27
Paternal grandmother	0.61	2.26
Maternal grandfather	1.04	2.34
Maternal grandmother	0.44	1.31
Parent generation (265 households)		
Average birth year	1939	13.93
Education (years of schooling)		
Father	6.29	3.06
Mother	6.29	3.00
Land area inherited (hectares)		
Father	0.48	0.93
Mother	0.22	0.63
Value of assets inherited (1989 pesos)		
Father	763.61	765.21
Mother	464.56	472.68
Parents with children older than 18 (801 children)		
Education (years of schooling)		
Father	5.44	3.04
Mother	5.18	2.84
Land area inherited (hectares)		
Father	0.45	1.01
Mother	0.37	0.90
Value of assets inherited (1989 pesos)		
Father	897.45	836.51
Mother	593.35	508.26
Child generation (801 children over 18 years of age)		
Average birth year	1959	8.80
Education (years of schooling)		
Son	8.55	3.02
Daughter	9.54	3.19
Land area to be inherited (hectares)		
Son	0.75	0.97
Daughter	0.32	0.64

[a] Ever-married respondents without remarriage.

3.23 years for their spouses, respectively. The gender difference in education appears to have been eliminated for the parent generation as a whole, with fathers and mothers both having an average of 6.29 years of schooling. (In the older families with children 18 years of age and above, fathers had slightly more education than mothers.) In the children's generation, daughters had higher schooling attainment than sons, at 9.54 years and 8.55 years, respectively. In contrast, men consistently had larger landholdings than women. Grandfathers on both sides owned about 1.2 hectares of land, compared with 0.5 hectares for the grandmothers. In the parent generation, mothers inherited about half the land area of fathers (0.22 compared to 0.48 hectares) for the whole sample. In the older subsample, women had slightly higher areas of inherited land (0.37 hectares), though less than men's (0.45 hectares). Daughters stand to inherit about half the area proposed to be bequeathed to sons (0.32 versus 0.75 hectares).[18]

Table 2 provides a picture of living patterns of grandparents in the sample. While only 15 percent of the respondents' parents, and 9 percent of spouses' parents, ever lived with their adult children for at least a year, almost half of the grandparents on both sides died in the same village as their adult children. In the older subsample with children above 18, a slightly larger percentage of grandparents had ever lived with their adult children, probably reflecting the greater need to rely on children for

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[18] It was not possible to compute the value of land bestowed to children, since the tenure status of individual parcels could not be determined. However, since it is likely that a tenure type is common to a family, differences in tenure types across families will be accounted for by the family fixed-effects estimates.

Table 2—Coresident arrangements of parents with adult children[a]

Variable	Mean	Standard Deviation
Parent generation (whole sample)		
Parents ever lived with adult respondent	0.15	0.36
Spouse's parents ever lived with adult respondent	0.09	0.28
At least one parent of respondent living as of date of interview	0.59	0.49
At least one parent of spouse living as of date of interview	0.48	0.50
Parents dying in same village as respondent	0.53	
Spouse's parents dying in same village as spouse	0.46	
Parents of children over 18 years of age		
Parents ever lived with adult respondent	0.16	0.37
Spouse's parents ever lived with adult respondent	0.12	0.32
At least one parent of respondent living as of date of interview	0.39	0.49
At least one parent of spouse living as of date of interview	0.33	0.47

[a] Whether or not parents lived with the adult respondent for at least a year.

old-age support. Among Filipino families, aging parents prefer to live independently, but eventually take up residence with adult children (Lopez 1991) and may remain with one child or circulate among their children.

RESULTS

Table 3 presents the results for the unrestricted nuclear family specifications, in which education of the respondent's children above 18 is regressed on child characteristics, including interactions of child gender with birth order and parental characteristics. The older sample is further divided into families that are able to bestow land to at least one child and those that are land constrained, since a Chow test shows that these subsamples have significantly different coefficients (F = 5.0 for the nuclear family specification; F = 4.2 for the extended family specification). Likelihood ratio tests support a model with the regressors and group effects, rather than a model without group effects; Hausman tests show that fixed effects is preferred to random effects.

For the whole sample, the female dummy is insignificant, although better-educated fathers tend to favor daughters. Better-educated mothers also favor daughters in education, but this effect is not statistically significant. On the other hand, sons of mothers with larger landholdings receive more education. The secular expansion of educational opportunities, proxied by linear and quadratic terms in birth year, benefits later-born children. The same results hold for the sample with land bestowal. Families facing resource constraints, however, tend to concentrate

Table 3—Education of respondent's children above 18, by parents' ability to bestow land, family fixed and random effects estimates, with complete interactions, nuclear family estimates[a]

Variable	Whole Sample: Fixed Effects	Whole Sample: Random Effects	Sample With Land Bestowal: Fixed Effects	Sample With Land Bestowal: Random Effects	Sample Without Land Bestowal: Fixed Effects	Sample Without Land Bestowal: Random Effects
Constant	...	-17,937.0***	...	-17,756.0***	...	12,991.0
		(-4.09)		(-3.93)		(0.79)
Child characteristics						
Female dummy	-5.75	5.56	-11.99	-4.28	178.34	225.38
	(-0.13)	(0.13)	(-0.26)	(-0.10)	(1.14)	(1.53)
Birth year	16.09***	18.24***	16.34***	18.05***	-19.05	-13.36
	(3.37)	(4.07)	(3.30)	(3.91)	(-0.99)	(-0.79)
(Birth year/1,000) squared	-4.08***	-4.63***	-4.14***	-4.56***	4.89	3.43
	(-3.35)	(-4.05)	(-3.27)	(-3.88)	(1.00)	(0.80)
Eldest dummy	0.52	0.37	0.35	0.15	1.80*	2.14**
	(1.42)	(1.09)	(0.90)	(0.41)	(1.72)	(2.25)
Child gender-birth order interactions						
Female x birth year	0.003	-0.003	0.006	0.002	-0.09	-0.11
	(0.14)	(-0.14)	(0.26)	(0.08)	(-1.10)	(-1.50)
Eldest daughter	-0.35	-0.37	-0.14	-0.08	-2.79*	-3.60**
	(-0.69)	(-0.75)	(-0.27)	(-0.15)	(-1.67)	(-2.35)
Child gender-parent characteristic interactions						
Female x father's education	0.13**	0.17***	0.16**	0.20***	-0.46	-0.29
	(1.98)	(2.87)	(2.25)	(3.31)	(-1.31)	(-0.94)
Female x mother's education	0.01	0.07	0.003	0.09	0.08	0.35
	(0.17)	(1.08)	(0.36)	(1.32)	(0.27)	(1.53)
Female x father's inherited land	0.24	0.26	0.23	0.18	-5.30	-4.35
	(1.24)	(1.51)	(1.15)	(1.08)	(-1.06)	(-0.98)
Female x mother's inherited land	-0.51**	-0.34 [a]	-0.50**	-0.36**	-25.89	-34.52 [a]
	(-2.50)	(-1.87)	(-2.40)	(-1.94)	(-1.20)	(-1.95)
Log likelihood	-1,475.84		-1,329.67		-133.58	
Number of observations	707	707	639	639	68	68
Hypothesis tests (χ^2 statistics)						
X's and group effects versus X variables only	526.65***		440.74***		56.25***	
Random effects versus X variables only (LM test)		271.99***		217.72***		9.71***
Fixed versus random effects (Hausman)	25.24***		25.56***		22.97***	
Likelihood ratio tests (χ^2 statistics)						
Gender-birth order interactions = 0	0.72		0.24		5.25 [a]	
Gender-parent characteristic interactions = 0	16.36***		17.42***		9.89**	
All gender interactions = 0	18.72***		20.34***		13.62**	

[a] Asymptotic t-statistics in parentheses.

* Significant at $\alpha = 0.10$.
** Significant at $\alpha = 0.05$.
*** Significant at $\alpha = 0.01$.

investment in the eldest child, except if that child is a daughter. This is consistent with lineage or dynastic considerations (Chu 1991), in which investment is concentrated in the child most likely to succeed. Among Filipino families, it is common for the eldest child to work to support the younger siblings through school. However, the eldest daughter's traditional role as mother-surrogate (Nurge 1965) may give her a higher value in home production, particularly in caring for younger siblings. Similar to the results for the whole sample, mothers with more inherited land tend to favor sons.

This "cross-gender preference" result is unusual and needs to be investigated further, since it deviates from the findings of Thomas (1990, 1994) and King and Lillard (1987), which show greater impact of parental characteristics on children of the same gender. Moreover, son preference by mothers seems to be associated with higher levels of physical rather than human capital. Likelihood ratio tests indicate that interactions of child gender with birth order are important only for families facing resource constraints, these interactions being insignificant in the whole sample and the sample with land bestowal. However, the interactions of child gender and parental characteristics are jointly significant in all equations, and, thus, this author rejects the null hypothesis that all gender interactions are equal to zero.

Table 4 presents analogous results for the extended family specification. While hypothesis tests confirm the validity of a model with regressors and group effects versus regressors only, the Lagrange multiplier tests support a model with random effects, and a Hausman test accepts the importance of individual heterogeneity rather

Table 4—Education of respondent's children above 18, by parents' ability to bestow land, family fixed and random effects estimates, with complete interactions, extended family[a]

Variable	Whole Sample Fixed Effects	Whole Sample Random Effects	Sample With Land Bestowal Fixed Effects	Sample With Land Bestowal Random Effects	Sample Without Land Bestowal Fixed Effects	Sample Without Land Bestowal Random Effects
Constant	...	-17,932.0***	...	-16,747.0***	...	6,181.1
		(-3.83)		(-3.57)		(0.32)
Child characteristics						
Female dummy	-51.89	-60.53	-65.00	-74.35	302.81*	301.33*
	(-1.12)	(-1.34)	(-1.33)	(-1.57)	(1.73)	(1.75)
Birth year	15.72***	17.69***	15.42***	17.03***	-7.26	-6.41
	(3.21)	(3.81)	(3.03)	(3.55)	(-0.36)	(-0.32)
(Birth year/1,000) squared	-3.99***	-4.49***	-3.91***	-4.32***	1.88	1.66
	(-3.19)	(-3.79)	(-3.01)	(-3.53)	(0.36)	(0.33)
Eldest dummy	0.43	0.30	0.27	0.10	2.07*	2.06**
	(1.18)	(0.86)	(0.68)	(0.26)	(1.92)	(1.96)
Child gender-birth order interactions						
Female x birth year	0.03	0.03	0.03	0.04	-0.15*	-0.15*
	(1.13)	(1.36)	(1.34)	(1.58)	(-1.70)	(-1.72)
Eldest daughter	-0.14	-0.06	0.10	0.27	-3.35*	-3.49**
	(-0.27)	(-0.12)	(0.18)	(0.52)	(-1.86)	(-1.96)
Child gender-grandparent characteristic interactions						
Female x paternal grandfather's education	0.06	0.06	0.11	0.10	-0.41	-0.40
	(0.72)	(0.84)	(1.26)	(1.33)	(-0.77)	(-0.77)
Female x paternal grandmother's education	-0.05	-0.07	-0.07	-0.08	1.68*	1.69**
	(-0.55)	(-0.75)	(-0.69)	(-0.89)	(1.92)	(1.97)
Female x paternal grandfather's land owned	-0.002	-0.002	0.01	0.10	-0.43	-0.47
	(-0.03)	(-0.0005)	(0.24)	(0.21)	(-0.43)	(-0.48)
Female x paternal grandmother's land owned	0.01	0.03	0.02	0.02	-0.16	-0.06
	(0.18)	(0.35)	(0.29)	(0.33)	(-0.12)	(-0.04)
Female x maternal grandfather's education	-0.07	-0.11	-0.03	-0.06	-0.34	-0.36
	(-0.85)	(-1.44)	(-0.30)	(-0.69)	(-0.67)	(-0.74)
Female x maternal grandmother's education	0.14	0.18*	0.12	0.17*	-1.04	-1.06
	(1.30)	(1.89)	(1.12)	(1.71)	(-1.14)	(-1.18)
Female x maternal grandfather's land owned	0.04	0.74	0.06	0.09	-1.73	-1.55
	(0.42)	(0.98)	(0.75)	(1.16)	(-0.58)	(-0.54)
Female x maternal grandmother's land owned	-0.05	-0.04	-0.04	-0.04	3.57	3.42
	(-0.47)	(-0.37)	(-0.39)	(-0.40)	(1.02)	(1.00)
Log likelihood	-1,482.19		-1,335.09		-128.39	
Number of observations	707		639		68	
Hypothesis tests (χ^2 statistics)						
X's and group effects versus X variables only	548.55***		471.33***		46.54***	
Random effects versus X variables only (LM test)		326.54***		294.52***		1.43
Fixed versus random effects (Hausman)	7.00		10.95		0.0001	
Likelihood ratio tests (χ^2 statistics)						
Gender-birth order interactions=0	2.04		2.26		7.84**	
Gender-grandparent characteristics interaction=0	3.66		6.58		7.84**	
All gender interactions=0	6.02		9.50		24.00***	

[a] Asymptotic t-statistics in parentheses.
* Significant at $\alpha = 0.10$.
** Significant at $\alpha = 0.05$.
*** Significant at $\alpha = 0.01$.

than family fixed-effects. For the whole sample and the subsample with land bestowal, linear and quadratic terms in birth year are significant, indicating that later-born children are favored by the secular increase in educational opportunities. Daughters with more educated maternal grandmothers have a slight advantage (significant at 10 percent). Among more constrained families, the null hypothesis that gender-birth order interactions and gender-grandparent interactions are equal to zero is rejected. The significance of gender interactions with grandparent characteristics for more constrained families suggests that the extended family may significantly affect intrahousehold allocation when families face resource constraints. Moreover, the importance of gender interactions with birth order among poorer families indicates that parents may have to choose in which child to invest. For example, the eldest child is favored, unless it is a daughter. Finally, the insignificance of the birth year suggests that the secular expansion in educational opportunities may not adequately offset more constrained families' need to prioritize investments in children.

Table 5 presents both restricted and unrestricted estimates of the determinants of proposed land bequests for both nuclear and extended family specifications. Hypothesis tests support a model with regressors and group effects, while a Hausman test suggests that random effects is the preferred model. In the unrestricted nuclear family specification, better-educated fathers tend to give land preferentially to daughters. In the analogous extended family specification, daughters of better-

Table 5—Proposed land bequests to children above 18, family-fixed and random effects estimates, nuclear and extended family specifications, unrestricted and restricted estimates[a]

Variable	Nuclear Family Fixed Effects	Nuclear Family Random Effects	Extended Family Specification Fixed Effects	Extended Family Specification Random Effects	Restricted Estimates: Nuclear Family Specification Fixed Effects	Restricted Estimates: Extended Family Specification Random Effects
Constant	...	11.80	...	-129.33	-24.30	-159.97
Child characteristics						
Female dummy	21.97	19.07	17.37	9.86	-0.93***	-0.51***
	(1.08)	(1.00)	(0.84)	(0.51)	(-5.69)	(-4.06)
Birth year	1.33	-0.01	1.24	0.13	0.03	0.17
	(0.64)	(-0.01)	(0.57)	(0.07)	(0.02)	(0.08)
(Birth year/1,000) squared	-0.34	0.003	-0.32	-0.03	-0.01	-0.04
	(-0.63)	(0.01)	(-0.57)	(-0.07)	(-0.02)	(-0.07)
Eldest dummy	0.15	0.08	0.16	0.09	0.02	0.04
	(0.99)	(0.59)	(1.03)	(0.60)	(0.15)	(0.38)
Child gender-birth order interactions						
Female x birth year	-0.01	-0.01	-0.01	-0.005	...	...
	(-1.13)	(-1.04)	(-0.86)	(-0.53)		
Eldest daughter	-0.24	-0.14	-0.22	-0.10	...	...
	(-1.12)	(-0.72)	(-1.03)	(-0.51)		
Child gender-parent characteristic interactions						
Female x father's education	0.06**	0.05*	...	...	0.05*	...
	(2.17)	(1.89)			(1.74)	
Female x mother's education	0.03	0.04	...	...	0.03	...
	(0.93)	(1.24)			(1.05)	
Female x father's inherited land	-0.01	0.04	...	...	0.03	...
	(-0.15)	(0.44)			(0.35)	
Female x mother's inherited land	-0.03	-0.02	...	...	0.004	...
	(-0.42)	(-0.26)			(0.06)	
Child gender-grandparent characteristic interactions						
Female x paternal grandfather's education	...	...	0.10***	0.08***	...	0.07***
			(3.00)	(2.68)		(2.62)
Female x paternal grandmother's education	...	...	-0.08**	-0.07*	...	-0.07*
			(-1.99)	(-1.92)		(-1.95)
Female x paternal grandfather's owned land	...	...	0.01	0.44	...	0.002
			(0.40)	(0.16)		(0.09)
Female x paternal grandmother's owned land	...	...	-0.02	-0.01	...	-0.01
			(-0.69)	(-0.51)		(-0.47)
Female x maternal grandfather's education	...	...	-0.08	-0.02	...	-0.02
			(-0.18)	(-0.52)		(-0.55)
Female x maternal grandmother's education	...	...	0.03	0.03	...	0.03
			(0.61)	(0.74)		(0.73)

(continued)

Table 5 (continued)

Variable	Nuclear Family Fixed Effects	Nuclear Family Random Effects	Extended Family Specification Fixed Effects	Extended Family Specification Random Effects	Restricted Estimates: Nuclear Family Specification Fixed Effects	Restricted Estimates: Extended Family Specification Random Effects
Female x maternal grandfather's owned land	...	...	-0.008 (-0.28)	-0.006 (-0.224)	...	-0.003 (-0.10)
Female x maternal grandmother's owned land	...	...	-0.008 (-0.20)	-0.01 (-0.30)	...	-0.01 (-0.36)
Log likelihood	-304.78		-304.38		-306.09	-305.32
Number of observations	367	367	367	367	367	367
Hypothesis tests (χ^2 statistics)						
X's and group effects versus X variables only	290.44***		291.71***		287.90***	289.83***
Random effects versus X variables only (LM test)		140.52***		133.44***	139.61***	133.41***
Fixed versus random effects (Hausman)	7.31		7.83		6.41	6.63
Likelihood ratio tests (χ^2 statistics)						
Gender-birth order interactions = 0	2.614		1.89		...	...
Gender-parent characteristic interactions = 0	13.72***				...	...
Gender-grandparent characteristics interaction = 0	...		14.53*		...	...
All gender interactions = 0	14.44**		15.25		...	...

[a] Asymptotic t-statistics in parentheses.

* Significant at $\alpha = 0.10$.
** Significant at $\alpha = 0.05$.
*** Significant at $\alpha = 0.01$.

educated paternal grandfathers—and sons of better-educated paternal grandmothers—are favored. Interactions of child gender with birth order are insignificant, but interactions of child gender with parental and grandparent characteristics are jointly significant in the nuclear family and extended family specifications, respectively. Results from reestimating the equations without the insignificant interaction terms are also found in Table 5. For the nuclear family specification, land bequests are preferentially given to sons, although better-educated fathers favor daughters. The tendency to bestow land to sons also persists in the extended family specification, reinforced by the tendency for better-educated paternal grandmothers to allocate land preferentially to grandsons. However, daughters of better-educated paternal grandfathers receive more land.

Finally, Table 6 presents restricted estimates of the education equations. Since fixed effects is the preferred model for the nuclear family specification, only these estimates are presented; for the extended family specification, random effects is preferred for the whole sample and the sample without land.

For the entire sample and among wealthier families, in the nuclear family specification, later-born children clearly benefit from the secular expansion in educational opportunities. While girls do not have a specific advantage (the female dummy is insignificant), daughters of better-educated fathers receive more schooling. Wealthier mothers, however, tend to favor boys in education. Families facing land constraints tend to concentrate education in the eldest child, except if that child is a girl. In the extended family specification, for the whole sample and the sample

Table 6—Education of respondent's children above 18, by parents' ability to bestow land, nuclear and extended family specifications, restricted estimates[a]

Variable	Nuclear Family Specification: Whole Sample Fixed Effects	Nuclear Family Specification: Sample With Land Fixed Effects	Nuclear Family Specification: Sample Without Land Fixed Effects	Extended Family Specification: Whole Sample Random Effects	Extended Family Specification: Sample With Land Fixed Effects	Extended Family Specification: Sample Without Land Random Effects
Constant	...	...	...	-17,773.00***		6,181.1
				(-4.011)		(0.32)
Child characteristics						
Female dummy	0.24	-0.01	178.34	0.91***	0.82***	301.33*
	(0.58)	(-0.01)	(1.14)	(5.29)	(4.46)	(1.75)
Birth year	16.10***	16.45***	-19.05	18.06***	16.81***	-6.41
	(3.39)	(3.34)	(-0.99)	(3.99)	(3.38)	(-0.32)
(Birth year/1,000) squared	-4.08***	-4.17***	4.89	-4.59***	-4.26***	1.66
	(-3.36)	(-3.31)	(1.00)	(-3.96)	(-3.35)	(0.33)
Eldest dummy	0.34	0.27	1.80*	0.26	0.27	2.06**
	(1.30)	(0.99)	(1.72)	(1.06)	(1.00)	(1.96)
Child gender-birth order interactions						
Female x birth year	...	...	-0.09	...	...	-0.15*
			(-1.10)			(-1.72)
Eldest daughter	...	...	-2.79*	...	...	-3.49**
			(-1.67)			(-1.96)
Child gender-parent characteristic interactions						
Female x father's education	0.13**	0.16**	-0.46	...	...	...
	(2.00)	(2.31)	(-1.31)			
Female x mother's education	0.01	0.03	0.08	...	...	...
	(0.16)	(0.38)	(0.27)			
Female x father's inherited land	0.24	0.23	-5.30	...	...	...
	(1.25)	(1.19)	(-1.06)			
Female x mother's inherited land	-0.51**	-0.51**	-25.89	...	...	...
	(-2.54)	(-2.48)	(-1.20)			
Child gender-grandparent characteristic interactions						
Female x paternal grandfather's education	...	...	...	...	...	-0.40
						(-0.77)
Female x paternal grandmother's education	...	...	...	...	...	1.69**
						(1.97)
Female x paternal grandfather's land owned	...	...	...	...	...	-0.47
						(-0.48)
Female x paternal grandmother's land owned	...	...	...	...	...	-0.06
						(-0.04)
Female x maternal grandfather's education	...	...	...	...	...	-0.36
						(-0.74)
Female x maternal grandmother's education	...	...	...	...	...	-1.06
						(-1.18)

(continued)

Table 6 (continued)

Variable	Nuclear Family Specification: Whole Sample Fixed Effects	Nuclear Family Specification: Sample With Land Fixed Effects	Nuclear Family Specification: Sample Without Land Fixed Effects	Extended Family Specification: Whole Sample Random Effects	Extended Family Specification: Sample With Land Fixed Effects	Extended Family Specification: Sample Without Land Random Effects
Female x maternal grandfather's land owned	...	...	...	...	...	-1.55 (-0.54)
Female x maternal grandmother's land owned	...	...	...	...	...	3.42 (1.00)
Log likelihood	-1,476.20	-1,329.79	-133.58	-1,485.19	-1,339.84	-128.39
Number of observations	707	639	68	707	639	68
Hypothesis tests (χ^2 statistics)						
X's and group effects versus X variables only	527.03***	440.99***	56.25***	554.92***	477.18***	46.54***
Random effects versus X variables only (LM test)	276.20***	220.53***	9.71***	355.95***	306.54	1.43
Fixed versus random effects (Hausman)	24.34***	24.81***	22.97***	5.87	10.76**	0.0001

[a] Asymptotic t-statistics in parentheses.

* Significant at $\alpha = 0.10$.
** Significant at $\alpha = 0.05$.
*** Significant at $\alpha = 0.01$.

with land bestowals, gender interactions are jointly equal to zero, so intrahousehold allocation appears to respond only to child characteristics. Daughters and later-born children are clearly favored. For the sample without land, however, gender interactions with birth order are significant, and may offset the independent positive effect of being female. However, daughters with better-educated paternal grandmothers may have an advantage.

4. SUMMARY AND CONCLUSIONS

This paper has examined the role of the extended family on investments in children. Econometric results show that grandparent interactions with child gender influence the distribution of proposed land bequests between sons and daughters. However, grandparents significantly affect intrahousehold differences in education only when families face resource constraints. Individual heterogeneity rather than family-specific effects dominates decisions within the extended family. In contrast, these family-specific unobservables are important in determining the pattern of investment in children within the nuclear family, and the interaction between parent characteristics and child gender are important determinants of both land transfers to and educational investments in children. Sons are clearly favored in terms of land inheritance. Although daughters may achieve higher mean levels of education—and, in fact, are favored when interactions with parent or grandparent characteristics are not considered, the secular expansion of education has contributed much to the increased educational attainment of women. Better-educated fathers also favor daughters in terms of education, while mothers with more land tend to favor sons.

The above results suggest that Filipino parents and grandparents consider both equity and efficiency goals when making transfers to children. The bestowal of land to sons may be motivated by efficiency objectives, since rice farming is intensive in male labor, and returns to specific experience (Rosenzweig and Wolpin 1985) can better be captured by sons, who typically assist in farm tasks from an early age. If sons remained in their natal villages to farm, they would be a more secure source of old-age support. The higher educational attainment of daughters may result from a relatively egalitarian family structure (Medina 1991), but may also reflect children's own demand for schooling. Girls remain in school longer than boys, partly because the formal educational system, whose staff is predominantly female, reinforces the socialization patterns of girls (Bouis et al. 1994). Since girls are socialized to be responsible and loyal to their families, they are likely to remit incomes to their parents if they migrate (Lauby and Stark 1988). Preferential investment in girls' education, and transfers of land to sons, would then be consistent with a risk-diversification strategy for parents.

While the nuclear family appears to have a stronger influence on intrahousehold allocation, the extended family's role in resource-constrained situations cannot be minimized. The resource pool offered by the extended family may influence allocations to children, with the family investing in the child most likely to succeed, usually the eldest. Indeed, the bias against elder daughters in constrained families may reflect her traditional role as mother-surrogate (Nurge 1965) and greater value in home production. These results are consistent with findings for Taiwan (Parish and Willis 1994), where earlier-born females in large families do poorly with respect to education because they marry early; older sisters, in fact, help increase the education of younger siblings of both sexes. The insignificance of the birth year in the regressions for poorer families also suggests that such families may not be able to take full advantage of the secular expansion of education. Thus, efforts to improve rural incomes—and intrahousehold allocation—in the long run require not only the provision of greater educational opportunities, but also measures to improve the access of the poor to credit and asset markets.

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