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Intergenerational co-residence and schooling ☆

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A B S T R A C T

This paper investigates how parents' expectations of co-residence with their children affects schooling outcomes. Using an overlapping generations model, the effect is shown to be ambiguous; it depends on how schooling affects life cycle income profiles. The empirical analysis utilizes household data that reports young parents' expectations regarding residence in old age and also provides measures of schooling achievement for their children. Identification comes from interactions of demographic shocks that differentially affect the probability of co-residence with specific children with measures that affect the profitability of the inter-generational contract with children relative to an autarchic option whereby parents live alone but can still enter into consumption smoothing contracts with members of their extended family network. Through regressions that also condition on the total number of children, the ratio of sons to total children and household savings. I find that the expectation of co-residence with a child reduces the child's attendance in school and schooling achievement.

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Introduction

"There is …an interesting question of why the demand for the schooling of children exists, given that it destroys a family structure of which the older generation has always approved and a family economy that brought them benefits in proportion to the number of children they had (Caldwell 1980)."

This paper examines how the expectation of future co-residence affects parental investments in their children's schooling. In economies with weakly developed financial markets, such as India, many households lack access to the financial instruments that enable saving to smooth consumption over the life cycle. Instead, co-residence with a child is the primary method of ensuring consumption requirements in old age.

How does this contract affect the schooling and hence the wealth of future generations? The effect is generally perceived to be positive. Researchers have argued that old-age support is just one side of a reciprocal exchange system, whereby parents invest in the schooling of their children in anticipation of support in old age (Lillard and Willis, 1997). If imperfectly developed financial markets also imply lack of access to the credit necessary to finance educational investments, the inter-generational family unit can

substitute for formal markets, enabling implicit loans for schooling from parents to their young children, that, when subsequently repaid, support the consumption requirements of elderly parents. Others, however, note that collective or social institutions may enhance poverty because default remains a significant concern, even in social contracts (Greif, 1997). This may be particularly true of implicit intra-family contracts across generations; formal legal institutions are generally reluctant to intervene in intra-familial conflicts. Reducing the probability of default requires actions to enhance the value of the contract, and these may come at the cost of wealth enhancing investments.

I apply these insights to an analysis of the effect of inter-generational co-residence on schooling, building on a theoretical literature that examines loan contracts between overlapping generations when commitment is not possible (Lambertini, 1998 and Azariadis and Lambertini, 2003). Theoretical work that utilizes a two-period model with incomes rising between the two periods generally suggests an unambiguous effect of children's schooling on support for the elderly. In contrast, utilizing a model in which adults live three periods, I show that the effect of children's schooling on the terms of the implicit intergenerational contract, and hence the welfare of the elderly, is ambiguous. This is because the demand for, and supply of, credit depends not on wealth, but on the profile of income over the life cycle. If schooling makes income more "hump shaped", then the probability of adherence to the inter-generational loan contract increases with schooling, since it increases the demand for old-age support. However, if schooling also increases incomes in old age, the need for the family

contract is reduced, thereby increasing the likelihood of default by the child in question. In such cases, parents have a strong incentive to identify the child they will reside with at any early age and invest strategically in his education so as to reduce the probability of default.

An empirical analysis of the effect of expectations of co-residence on schooling investments is rendered difficult by the possibility of reverse causation: Residential choices may be made after observing a child's academic ability, so that it is schooling that determines co-residence rather than the other way around. Parents may identify the son with the least interest in schooling as their preferred child for co-residence in old-age, since he may be most likely to remain in rural areas and continue with traditional family occupations. Residential choices may also reflect other unobserved traits of children, including parental affinity for the child that could similarly generate biased estimates.

I address these issues by using social norms relating to residential arrangements and data on extended family networks to identify the effect of parents' expectations of co-residence with a specific child on investments in his or her schooling. The choice of co-residence is made by comparing the value of this contract to the autarchic option. This latter option, even though it implies residing alone with one's spouse, still provides access to consumption smoothing through contracts with members of the extended family network in the same village. I construct a measure of the value of this network for lifecycle consumption smoothing, based on the age difference between the father and his brothers, and interact this with variables that determine the probability that parents would contract with the child in question.

This probability reflects social norms that dictate that parents reside with a son, with the choice amongst sons reflecting the total number of sons. Typically, the oldest son moves out of the family residence on marriage, leaving parents to reside with the youngest son. Since this possibility is only available to parents with more than one son, those with just one son generally reside with their oldest, while parents with more than one son are more likely to reside with a younger son. Thus, the probability of old-age residence varies across children in the household, with an increase in the number of sons reducing the probability of parents' residing with the oldest son but increasing that of co-residence with younger sons.

Since the number of sons may be endogenous, I develop instruments based on variables that predict this number. Building on a literature that notes that the gender of the first child determines the number of children (and sons), and incorporating the variation in the probability of co-residence across children in the household, I use as an instrument the triple interactions of an indicator variable for whether the child is the oldest or younger son, an indicator variable for the gender of the first child and the age-difference measure of the value of the extended family network.

The strength of the identification strategy stems from this triple interaction that allows the effect of the age of the father's brother to vary across households depending on their demographic structure and, additionally, to vary across children within a household. To ensure that identification comes only from this triple interaction, all regressions include indicator variables for the oldest and youngest son, the age difference, and the gender of the first child. I also condition on a rich array of other variables that may be likely to confound results, including the number of the father's brothers and sisters, and the land holdings of grandparents on both sides of the family.

There are two primary concerns with this strategy. First, since the gender of the first child predicts both the number of children and the ratio of sons to this total number, the instruments may be correlated with these demographic outcomes, despite the fact that the gender of the first child is included as an independent regressor. In turn, fertility choices of parents, or the number of children in the household, will directly affect schooling investments through a quality-quantity trade-off. Second, I assume that expectations of old-age residence affect the rate of return to investments in children's schooling or, equivalently, the rate of return on implicit intergenerational credit contracts that enable long-term consumption smoothing over the life cycle. However, the demographic characteristics and information on extended family networks used as instruments may also determine current income and access to short-term credit markets, and hence the availability of funds to finance current consumption requirements, including schooling.

To address the first concern, I extend the research documenting the demographic consequences of the gender of the first child, noting that the gender of the first *two* births has different implications for the number of sons and the total number of children. While I defer a detailed discussion to the body of this paper, this implies that indicator variables for four household types, distinguished by the gender of the first two births (son–son, son–daughter, daughter–son, daughter–daughter), satisfy the rank conditions to identify both the total number of sons as well as the total number of children. Using these four indicator variables, I estimate regressions that condition not just on expectations of co-residence, but also on the total number of children and on the proportion of sons, treating both as endogenous.

I address the second concern, that the instruments predict access to short term consumption smoothing mechanisms rather than those that enable life-cycle smoothing, by further conditioning regressions on household's current savings. This regression recognizes that current savings reflect current income and current credit constraints. Household savings are treated as endogenous, and are instrumented by baseline values of financial assets. Controlling for current credit constraints and income mitigates the possibility that estimates of expectations of old-age residence with the child reflect current credit constraints, rather than the demand for life cycle consumption smoothing.

The empirical analysis uses household data from rural Karnataka state, in South India. The data set, part of a larger study on the determinants of schooling in the region, provides information on expected residential arrangements in old age of young parents who are currently investing in their children's schooling. This is invaluable for several reasons. First, the data provide the "correct" independent variable of interest: it is only *expectations* of future residential patterns that can affect schooling investments at the time that they are made. Second, the availability of data at the time when schooling investments are being made provides "correct" measures of other relevant variables. Studies based on data on the current elderly and their adult children generally lack information on savings and school quality at the time that current adults were in school.

The drawback of using data on households at the time of investing in their children's schooling is that I cannot examine the effect of expectations of co-residence on *completed* schooling. Instead, I measure household investments in a child's schooling by the proportion of school days that the child attended school in the 2012–13 school year. Attendance data are from school administrative records. This is important, since it removes the need to rely on parent-provided measures of their investment in their children, such as reported hours of work or expenditures on private tuitions. I also provide results that examine the effect of expectations of old-age residence with the child on test scores for both language and mathematics, using tests that were independently designed and implemented for the purpose of this survey.

The analysis of this paper reveals that school attendance is lowered by parent's expectation of co-residence with a child. The