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Intra-household Competition for Care: The Role of Bequest-regulating Social Norms.

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Abstract: We model the allocation of time resources by adult children between competing caring activities - those towards coresiding elderly and those towards coresiding children. We test the implications of our model for children's school performance by focusing on Indonesia, a country characterized by heterogeneity in social norms, population ageing and reliance on the family for elderly support. Specifically, we exploit the unique richness of the Indonesian Family Life Survey (IFLS) (Wave 2 to Wave 4) to find robust evidence of a negative impact on children's school achievement of social norms regulating elderly bequests to coresiding adult carers.

Keywords: intra-household care-giving, children's education, social norms, co-residence with elderly. JEL codes: D1, I2, J2, O1

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1. Introduction

As economies urbanise and as employment shifts from the agricultural to the non-agricultural sectors, poverty reduction hinges on investments in the next generation's human capital. Investment in education is an important form of intergenerational transfer for poor households. Decision making regarding children's health, education and human capital accumulation is typically made at the household level. Similarly, as parent's age, family decisions include co-residence issues which influence adults' allocation of time and resources between competing caring jobs — those that directly benefit the children and those that are directed towards the household's elderly. Also, caregiving for the household's sick elderly individuals is often the responsibility of co-residing adult children, female family members in particular (Magnani and Rammohan, 2009). These caregiving responsibilities affect the allocation of adult family member's time towards the household's children. These considerations pose challenging questions regarding the impact of the provision of elderly care on children's schooling investments in the context of multi-generation households. Specifically, is there intra-household competition for care between the older and the younger generations? If so, what is the impact on children's school achievements of this competition for care between the household's elderly and its children?

While intergenerational transfers of time resources have fundamental implications for the intergenerational transmission of poverty, the issue of care-giving to the elderly and how this care-giving potentially competes with alternative allocations of caring resources has been substantially overlooked. The literature to date has focused on the links between parental work and child schooling, household socio-economic characteristics and child schooling, and parental death and child schooling. Recent work by Attanasio and Kaufmann (2010) focuses on the effect of parents' and children's labour market expectations on the children's school choice and achievements. To our knowledge no previous study has examined the role of parents' non-paid care-giving commitments to elderly household members, and the manner in which these commitments impact on the educational attainment of the household's children. These issues are particularly significant for many low and middle income countries which are experiencing rapid population ageing and lack social safety nets for the elderly in the face of strong and persistent social norms for adult children to look after the household's elderly. In this sense, Indonesia offers a unique case study for reasons expanded upon below.

We address these issues by analyzing whether intra-household old age support affects the

household's investment in children's education and care. Our paper makes several contributions to the literature. Firstly, we explore whether co-residence of three generations of family members, namely the elderly, adults and children, can enhance children's school performance, possibly by loosening adult parents' time constraint. Secondly, we investigate whether care-giving activities by adults to elderly household members following elderly members' ill-health impacts upon children's school achievements. Thirdly, we specifically look at the set of cultural norms, market conditions and institutional constraints under which households make these important intra-household, inter-generational resource redistribution decisions in order to assess whether the property rights that the elderly hold over household resources may exacerbate the weakness of children in this negotiation process.

This paper is organized as follows. Section two reviews the relevant literature. Section three models the intra-household allocation of care resources of adults across competing recipients, namely children and the elderly. Section 4 and Section 5 describe the empirical strategies and the data, respectively. Section six reports the empirical results and the related robustness tests. Section seven concludes.

The main preliminary results can be summarized as follows. Our analysis supports the idea that in threegeneration households, where adults co-reside with both elderly and child household members, households allocate scarce time resources in a way that is sensitive to the set of constraints and rewards that caring activities entail. A set of monetary incentives and community norms are shown to have an important influence on decisions regarding the allocation of care resources among competing uses, in our case care for the household's children and elderly. These monetary incentives and community norms affect economically "distressed" and less distressed households differently. These results survive a number of robustness tests, including those that address the potential endogeneity of the enforcement of social norms regulating the link between care and bequest in co-residing households.

2. Background

As fertility rates decline and life expectancy increases, countries across the developing world face the prospect of rapidly aging populations, combined with lagging or non-existent social safety nets. These demographic changes have fundamental implications for the economies and societies of low and middle income countries. Higher incidence of poverty among older people implies that population ageing in low and middle income countries will, in the absence of policy interventions,

lead to rising global poverty. While the adverse macroeconomic effects of population ageing are well explored in the literature, its consequences at the household level in developing countries are generally overlooked.

In developing country environments, due to a lack of universal social safety nets, the household typically acts as an informal source of old-age security. As women are traditionally the main care providers for young and old dependants, deterioration in the health status of elderly members in the household can have an adverse impact on female labour market participation, and the household's allocation of time and resources to other household members. It is this *intra-household*, intergenerational effect of population ageing that this paper aims to investigate.

Indonesia is a particularly interesting economy in which to study these issues, for many reasons. First, population censuses since the early 1970s show rising education levels, delayed marriage and increasing workforce participation among Indonesian women, particularly in Java and Bali. Second, family relationships in Indonesia, while still modeled by a strong patriarchal principle and, at times, by an upsurge of religious extremism, are changing considerably, due to the speed of economic growth as well as more subtle processes of cultural change. Third, rapid population ageing has become a major demographic preoccupation in Indonesia in the twenty-first century. Lastly, figures from UNESCO on graduation rates in Indonesia suggest that educational attainment has been improving in recent decades, with enrolment rates for primary school aged children (7—12 year olds) almost 95 percent while enrolment rates for junior high school aged children (12—15 year olds) are just over 70 percent (UNESCO, 2005). However, the fact that primary enrolment rates are substantially higher than secondary enrolment rates suggests that while most children are receiving a primary education, many are not going on to attend high school. A potential explanation for this trend is poor schooling achievement despite high attendance rates.

There is a large literature examining schooling outcomes in Indonesia.[1] Several studies have explored the impact of poverty and parental death on child schooling outcomes in Indonesia.[2]

[1] See, for example, studies by Federman and Levine (2003), Suryahadi et al. (2005), Gertler et. at. (2003), Cameron (2001), Levine and Ames (2003), and Suryadarma et. al. (2009) among others.

[2] Studies by Gertler et al (2003) and Suryadarma (2009) find that parental death significantly increases the probability of a child dropping out of school. Gertler et al. (2003) find that the impact is highest among children in the transition

Jones's (2003) study using qualitative interviews in several Indonesian provinces finds that determinants such as poverty, the need for extra child income, cultural factors and attitudes to schooling were important in parental decisions regarding children's schooling. However, in focusing on investments in education in low and middle-income countries, the effect of co-residence with elderly family members and the impact of potential caring activities that adults perform towards elderly and child dependents are issues that have been overlooked in the literature. For example, in Indonesia, over 70 percent of the elderly (aged 60 years and above) co-reside with at least one of their children (Chan, 2006; UN, 2005). As Asher (1996) points out, social security systems in many low and middle income countries, including Indonesia, are inadequate and under-funded, leading to uncertainties for older persons.[3] An equally important but overlooked issue is the extent to which children's education may be at risk if working age adults face tight times and resource constraints. Furthermore, the role of traditional social norms regulating the link between adult children's receipt of a bequest and the care that they provide to their elderly parents is still unknown. Finally, while the link between poverty and child schooling is well established (e.g., Cameron, 2001, for a study on the Indonesian experience), relatively few studies have examined how care-giving responsibilities add to the burden of economically distressed households.[4]

3. Intra-household intergenerational allocation of resources. A conceptual framework

To model the time allocation of adult parents in the face of limited care resources, when both children and co-residing elderly family members need care, we rely on the following stylized facts: *(i)* consumption is not perfectly shared between members of an extended family; in other words, family members are not altruistic; *(ii)* intra-family distribution of resources follows motivations other than altruism; *(iii)* the intergenerational persistence of earnings varies significantly with the economic status of the parents. A number of studies have found support

between education levels. Although there is no gender bias in the impact of parental death, a female first-born child has a larger propensity to drop out of school than does a male first-born child. Thomas et al (2004) find that poor households tend to protect the education of older children at the expense of younger children. Suryahadi et al (2005) find that children from poorer households were required to work in order to pay for their education.

[3] For example, only 9 percent of Indonesian elderly report pension income as being their major source of income (Ofstedal et al, 2002; Anh et al, 1997).

[4] For example, the Indonesian financial crisis led to a significant increase in both chronic and transient poverty rates, with the proportion of transient poor increasing from 12.4 percent of the population in 1996 to 17.9 percent in 1999 (Sumarto et. al, 2005). The Indonesian Government set up an education funding support programme which started in the academic year 1998/99 and was planned to end in the year 2003.

for stylized fact *(i)* above. For example, Anderberg (2007) models family resource distribution characterized by one-directional altruism (towards the children) and two-directional intra-family transfers. A number of empirical studies have found support for this characterization of parents' behaviour. Altonji et al. (1992) use PSID data to test and reject a standard altruism model. Altonji et al. (1997) use PSID data to test and reject the hypothesis that *inter vivos* transfers from parents to children are motivated by altruism. Bratsberg et al. (2007) and Corak and Heisz (2004) provide evidence that intergenerational earnings mobility varies with the position of a family's income in the income distribution function.

We contribute to the literature in several ways. First, we model the tensions in intra-household *caring* resource distribution that households face, particularly in low and middle income countries where population ageing may occur without much financial support from social safety nets. Second, in our model, the emphasis is on the adults' *differential claims* on their children's future income and on the potential bequests of co-residing elderly family members. Third, we test the importance of claims of this nature for the educational outcomes of children, where a child's educational outcome is a proxy for a non-observable care allocation that benefits children. Lastly, we test whether labour market conditions, community norms and household economic distress weaken the strength of the parents' claim on their children's future income and induces the devolving of resources towards elderly care instead.

In doing so we adopt the following conceptual framework:

1) We consider three generation households where adults live with their children and their elderly parents. Adults are the decisions makers.
2) Parents behave selfishly and maximize an intertemporal utility function increasing in their present consumption (when adults) and in their future consumption when old.
3) From the adults' point of view, appropriability issues concerning both children's future labour incomes as well as future bequests received from co-residing elderly family members impact upon the returns of time and resource allocations between competing caring jobs. In other words, when choosing to invest in children's education, parents take into account the extent to which a given allocation of time and resources to competing caring jobs will make both their children and themselves better off in the future. Similarly, while in principle family assets may reduce the importance of time constraints (time may be bought to some extent), the desire to appropriate a larger share of the potential bequest may tilt the allocation of time towards elderly care.

4) Parents' ability to undertake investments in their children is constrained by the resources — money and time — available to them, the prices they face, and their ability to trade off present versus future resources (indicating the presence of capital markets or, alternatively, credit constraints).
5) The co-residing elderly may get sick and this health shock may exacerbate an already tight adult time constraint; hence the ability of parents to secure a positive outcome following their investment in children's education may be lessened.

These building blocks can be summarised as `preferences', `returns', `constraints', and `bargaining' and provide the foundation of our simple model of intra-household intergenerational allocation of time resources between competing care jobs.

3.1 An Over Lapping Generation model with three periods

Individuals live for three periods. Therefore, there are potentially three generations co-living in the same household: children, adults and the elderly. We will use the implications of our simple model to outline the relevance of (i) the elderly's co-residence for children's education, and (ii) the existence of social norms that regulate the link between adult children's caring activities towards the co-residing elderly and the bequest that adults receive as care providers. Adults are the decision makers in the household. In particular, they must allocate their scarce caring resources (time) between their elderly parents and their children. In formalizing this time allocation decision, we adopt features of both static and dynamic labour supply models (MaCardy, 1981): as in the standard static model, we assume that adults do not borrow or save during their working life so the current income consumption is simply equal to current income. However, as dynamic labour supply models do, the model allows for (children's) human capital accumulation. Adults' decisions involve the following set of considerations:

- Adults' time t_h is necessary for children's accumulation of human capital h. Thus $h = h(t_h)$ where t_h is the sum of time devoted to children's accumulation of human capital by adults co-living in a household ***hh***.
- Assume that the human capital function $h(.)$ is strictly concave so that $h'(.) > 0$ and $h''(.) < 0$.

Investment in human capital is relevant for the labour income children will earn once they have reached adulthood, where the total labour income is $w_{2,t+1}h(t)$. The first subscript indicates

the life period (2 for adulthood, dropped for convenience unless necessary) and the second subscript indicates the time period. Each adult has limited time T available, which he/she spends in potentially all three of the following activities: working outside of the household, caring for children within the household or caring for the elderly within the household. S/he devotes t_h time for children and t_{cg} time to care for elderly parents. Thus $t = T - t_h - t_{cg}^{hh_{unpaid}}$ is the time that an adult can spend in the labour market where s/he earns a market wage w_2. Alternatively, to provide care for their co-residing elderly, adults can pay for non-household members to care for the elderly. In this case the price they pay per unit of care time is $\mathbf{p}^{m}_{cg}$.

- In period 3, old agents do not work outside the household and they do not help with caring for the household's children (this assumption can be relaxed without loss of generality). Death occurs in period 3, but time of death is uncertain, so elderly household members may leave a bequest b. Note that the assumption that adults do not save in period two of their life implies that the bequest *b* they may be able to leave to their children in period 3 is an exogenously inherited share of family assets.[5] The share of b that co-residing adult children will get is π, while $(1-\pi)b$ will go to non-co-residing children. This share becomes available to adults only at the beginning of their elderly period (period 3). Assume the share of bequest that co-residing adults will be able to secure depends on the amount of time they devote to caring for their co-residing elderly, or $\pi = \pi(t_{cg})$ with $\pi'(.) > 0$ and $t_{cg} = t_{cg}^{hh\_unpaid} + t_{cg}^{hh\_paid}$.

In the simplest version of our model, selfish adult agents care only about their consumption (as adults) and their future consumption (as elderly).[6] They do not save as adults, but they possibly own or co-own some of the family's assets, which will constitute their bequest, given the uncertainty over the time of death. Adult agents face two possible ways to get money for their older age: they can invest in their children's education and appropriate a fraction of their future

[5] Clearly, this assumption simplifies our task. However, adults may attempt to increase *b* as a way to secure their care by adult children in period 3 of their life. We will check the relevance of these competing arguments in relation to the role played by bequest-regulating social norms in the intra-household allocation decision.

[6] Note that adults' utility function could include preference for the care they receive when older. If so, their working decisions may be sensitive to the social norms that regulate the amount of care adults provide to the elderly and to the bequest that elderly may leave to their adult children. We return to this point in our discussion of empirical results.

labour income, or they can provide care to their elderly co-residing parents (either by paying for formal care or by providing their own time) to increase the share of the bequest that they receive in the last period of their lives. Formally, the adult agent solves the following maximization problem:

$$\text{Max } U_i(c_{2,t}, c_{3,t+1})$$

$$\begin{aligned} \text{s.t.} \quad c_{2,t} &= w_{2,t}\left(T - t_h - t_{cg}^{hh\_unpaid}\right) - p_{cg}^{m} t_{cg}^{hh\_paid} \\ c_{3,t+1} &= \pi\left(t_{cg}^{hh_{paid}} + t_{cg}^{hh_{unpaid}}\right)b + \theta w_{2,t+1} h(t_h) \\ h &= h(t_h) \\ T &= t_w + t_h + t_{cg}^{hh_{unpaid}} \\ t_{cg} &= t_{cg}^{hh\_unpaid} + t_{cg}^{hh\_paid} \end{aligned}$$

The individual utility function U(.) for individual *i* has the usual characteristics: it is continuous and increasing in its arguments, it is twice differentiable and its first derivatives are never all simultaneously zero. Further, it is strictly quasi-concave. We seek equilibrium values for $t_h, t_{cg}^{hh_{unpaid}}, t_{cg}^{hh_{paid}}$ and t_w for a given time constraint T. Note that the only transfer from adults to elderly is in the form of caring time rather than money.

The maximization problem becomes

$$U\left[\left(w_{2,t}\left(T - t_h - t_{cg}^{hh\_unpaid}\right) - p_{cg}^{m} t_{cg}^{hh\_paid}\right), \left(\pi\left(t_{cg}^{hh\_paid} + t_{cg}^{hh\_unpaid}\right)b + \theta w_{2,t+1} h(t_h)\right)\right]$$

Note that the parameter **θ** indicates the share of their children's labour income that current parents will be able to appropriate once these children enter the workforce. The first order conditions of this maximization problem with respect to $t_h, t_{cg}^{hh\_unpaid}$ and $t_{cg}^{hh\_paid}$ are:

$$\frac{\partial U}{\partial t_h} = U_1(-w_{2,t}) + U_2 \theta w_{2,t+1} h'(.) = 0 \qquad (1)$$

$$\frac{\partial U}{\partial t_{cg}^{hh\_unpaid}} - U_1(-w_{2,t}) + U_2 \pi'(.)b - 0 \qquad (2)$$

$$\frac{\partial U}{\partial t_{cg}^{hh\_paid}} = U_1\left(-P_{cg}^{m}\right) + U_2 \pi'(.)b = 0 \qquad (3)$$

From (2) and (3)

$$\frac{U_1}{U_2} = \frac{\pi'(.)b}{P_{cg}^m} \quad (4)$$

$$\frac{U_1}{U_2} = \frac{\pi'(.)b}{w_{2,t}} \quad (5)$$

Clearly, (4) and (5) can be simultaneously identified only if $w_{2,t} = P_{cg}^m$. In other words,

if $w_{2,t} > P_{cg}^m \Rightarrow t_{cg}^{hh\_paid} > 0$

$t_{cg}^{hh\_unpaid} = 0$

if $w_{2,t} \leq P_{cg}^m \Rightarrow t_{cg}^{hh\_paid} = 0$

$t_{cg}^{hh\_unpaid} > 0$

From (4) and (1):

$$\frac{\pi'(.)b}{P_{cg}^m} = \frac{U_1}{U_2} = \frac{\theta w_{2,t+1} h'(.)}{w_{2,t}} \quad (6)$$

$$h'(.) = \frac{\pi'(.)b}{P_{cg}^m} \cdot \frac{w_{2,t}}{\theta w_{2,t+1}} \quad (7)$$

the following solutions are derived:

$$t_h^* = h'^{-1}\left[\frac{\pi'(.)b}{P_{cg}^m} \cdot \frac{w_{2,t}}{\theta w_{2,t+1}}\right] \quad (8)$$

$$\begin{cases} t_h = h'^{-1}\left[\dfrac{\pi' b}{P_{cg}^m} \cdot \dfrac{w_{2,t}}{\theta w_{2,t+1}}\right] \\ t_w = T - t_h \text{ if } w_{2,t} > P_{cg}^m \\ t_{cg}^{paid} > 0; t_{cg}^{unpaid} = 0 \end{cases} \quad (8')$$

$$\begin{cases} t_h^* = h'^{-1}\left[\dfrac{\pi' b}{P_{cg}^m} \cdot \dfrac{w_{2,t}}{\theta w_{2,t+1}}\right] \\ t_{cg}^{unpaid} = T - t_h^* \text{ if } w_{2,t} \leq P_{cg}^m \\ t_w = 0, t_{cg}^{paid} = 0 \end{cases} \quad (8'')$$

Expressions (8') in the case $w_{2,t} > P_{cg}^m$ and (8") in the case $w_{2,t} \leq P_{cg}^m$ clearly illustrate that the allocation of adult children's caring resources in favour of their children's school achievements will

(i) Increase proportionally with the productivity of adults' time devoted to

children (with $h'(.) > 0$);

(ii) Decrease proportionally with the extent of elders' property rights on family assets, as this is likely to increase b ;

(iii) Decrease proportionally with the responsiveness $\pi'(.)$ of the expected share of the bequest b to changes in time devoted to the elderly, for example as a result of social norms;

(iv) Increase proportionally with the children's labour income expected in time (t+1);

(v) Increase proportionally with the degree of appropriability **θ**, which measures the share of expected children's labour income that will go, once they are adults, to the current parents when they are in their third and final period of life.

A couple of comments on these results are important. First, note that the impact of the wage adults are currently earning on children's school achievement is likely to be ambiguous. This is for two reasons: (a) higher wages may increase the opportunity costs of non-working time, thus reducing children's care; (b) current higher wages may proxy for future wages that children will access when adults if they have accumulated sufficient human capital thus increasing children's care. It is this ambiguity that Attanasio and Kaufmann (2010) attempt to solve by formally investigating the impact of labour market expectations on schooling decisions. Secondly, note that to the extent that adults plan for their older age, the existence of social norms linking the amount of care the elderly receive to the bequest they are able to leave to their adult children may impact on their labour supply while adults. While we don't formally pursue this line of investigation in this paper, it is important to appreciate the richness of the model introduced above. Having these predictions in mind, we now approach the empirical testing of these hypotheses.

4. Testing the empirical implications of this model: the empirical strategies.

We use the Indonesian Family Life Survey 2000 (IFLS-3) and 2007 (IFLS-4) to study intra-household resource allocation when the various generations living in the same household compete for adults' caring attention. The 2000 Indonesian Family Life Survey (IFLS-3) is a randomly sampled nationally representative survey which covers 13 major provinces where

approximately 83 percent of the Indonesian population resides. The survey collects data on individual respondents, their households, their communities, and the health and educational facilities they use. The IFLS-3 dataset is rich and unique as it contains detailed information on households' demographic, labour market, health and economic characteristics, and on the availability of social safety nets. Testing the model predictions of Section 3 necessitates the resolution of a number of important issues which guide our identification strategy. The first issue arises in relation to the fact that our analytical model focuses on opportunities, returns, constraints and community norms that affect the individual's time allocation decisions. Thus, testing the empirical implications of our model requires information on adults' time allocation that the IFLS only partially provides. We deal with this issue in Section 4.1 below.

The second set of issues arises in relation to the *strategic dimension* of the co-residence decisions and time allocation decisions. At the *family level* each individual may strategically choose whether to co-reside with elderly family members. Co-residence with elderly individuals is potentially endogenous if adults with a low opportunity cost of time are more likely to co-reside and provide care for elderly family members. The decision of an elderly family member to co-reside with an adult child may have an associated opportunity cost that is correlated with the time allocation decisions of adult parents, e.g., supply labour services on the open market. Also, an elderly parent's residence in the household may reflect the outcome of a bargaining process among siblings, with the household choosing to care for an ill parent making an implicit decision to reduce participation in the labour market. These arguments prompt us to estimate the impact of coresidence with the elderly on children's education after controlling for the potentially endogenous decision to coreside with elderly (see Section 4.2 below). The other important dimension of strategic behaviour in the face of competing caring tasks takes place at the *household level*. Clearly, if there is any intra-household strategic interaction among care providers, estimation of the effect of a right hand side variable that does not take strategic interaction into account may produce biased results. We deal with this set of issues by means of sample restriction strategies, which we discuss in Section 4.3 below.

4.1 A simultaneous equation model of time allocation across competing tasks.

Given data on the allocation of adults' time resources among alternative uses, namely work, care of the elderly and child care, we could estimate a simultaneous equation model for the various uses of time (time to care for the children, time to care for the elderly and working

time). Despite its richness, the IFLS has limited information on time use. Instead of time devoted to care for the children co-residing with elderly and adults, what is observable is their educational achievement, which is conceivably dependent on the parent's attention and care towards him/her, among other factors, as a rich literature has amply demonstrated (see, for example, Jeynes, 2005; Dearing et al., 2006; Henderson et al., 2002). We thus use the school achievements of youngsters living with parents and some family elderly to proxy for adults' allocation of time to their children's human capital accumulation. We do have information about the hours of care elderly co-residents receive. Also known are the hours of work of adults (aged 15—55 in 2007). Thus we estimate a model of caring resources' allocation by specifying a simultaneous equation model for children's school achievement, hours of care devoted to elderly household members and working hours resulting from the optimizing decisions of selfish adults who face *claims* (on present or future assets owned by his/her care receivers) and market *returns* of such activities.

We estimate the following system of equations:

$$School\ Achievement_{C,i} = a_1 + A_2 X_{C,i} + A_3 X_i + A_4 X_{P,i} + A_5 X_{hh,i} + A_5 R_{O,i} + A_6 N_{hh,i} + A_7 Z_{hh,i} \quad \textbf{(9)}$$

$$Care_{O,i} = b_1 + B_2 X_{O,i} + B_3 X_i + B_4 X_{P,i} + B_5 X_{hh,i} + B_6 R_{O,i} + B_7 N_{hh,i} + B_8 Z_{hh,i} \quad \textbf{(10)}$$

$$Working\ Hours_i = d_1 + D_2 X_i + D_3 X_{P,i} + D_4 X_{hh,i} + D_5 R_{O,i} + D_6 N_{hh,i} + D_7 Z_{hh,i} \quad \textbf{(11)}$$

In the system (9)-(11) adult care provider *i* who coresides in household *hh* with elderly (*O*) and children (*C*) is the unit of observation. Result (i) in Section 3, states that the adults' investment in children education may depend on the productivity of their time in the production of human capital h(.) To allow for the return to school achievement of children to be affected by the educational level of the child's mother and father (who may not be the main care providers for their children) we also include a set of variables (specifically education) of parents *P*.

In the system above we use the following set of variables:

(i) Characteristics $X_{C,i}$ of child C related to main care provider *i* in household *hh*. In particular, we observe whether the child is male or female and the child's age and age squared.

(ii) Characteristics $X_{O,i}$ of elderly O co-residing in household *hh*. In particular, we are interested in capturing the impact of an elderly health shock on the adults' allocation of care resources.
(iii) Characteristics X_i of the main care provider *i* in household *hh*. The model presented in Section 3 highlights the relevance for the adults' time allocation decisions of their wage, relative to the price of elderly care.
(iv) Characteristics $X_{P,i}$ of parents P of child C whose main carer is *i* in household *hh*.
(v) Characteristics $X_{hh,i}$ of household *hh,* particularly the household demographic structure, namely the presence of very young children (0—6), the presence of older children (7—14), the number of females of working age and the number of males of working age.
(vi) Property Rights $R_{O,i}$ of elderly O on the household's assets (house, land, for example) and whether property rights are shared with someone else.
(vii) Community norms $N_{hh,i}$ that regulate the distribution of the elderlys' assets among potential beneficiaries.
(viii) Labour market characteristics $Z_{hh,i}$ in the province where household *hh* is located.

Our main sample includes all households where three generations coreside and for whom we can create an "average" time allocation of resources by all adults possibly involved in caring decisions at the household level. In this case we test the statistical significance of community norms, "property rights" and claims for the household's "average" allocation of time and resources between alternative uses. This sample is relatively large (4164 households). However, we cannot exclude the presence of selection bias, namely that these co-residing households result from a process of selection based on the endogeneity of the co-residing decision. Furthermore, given the potential presence of more than one care provider in our main sample, we cannot exclude a strategic interaction with the various adults in the same household. We deal with these issues in Sections 4.2 and 4.3, respectively.

4.2 The potential endogeneity of co-residing decisions

In estimating the impact of care-giving on children's school performance, we need to consider the potential endogeneity of the decision to coreside with elderly family members. Co-residence with elderly individuals is potentially endogenous if individuals with a low opportunity cost of time are more likely to co-reside and provide care for elderly family members. To deal with the potential endogeneity of the decision to co-reside with elderly family members, we propose two econometric specifications. The first one deals with the joint event governing co-residence with the elderly and childrens' school achievements.

The specification for a child's school achievement is

$$School\ Achievement_{C,i} = a_1 + A_2 X_{C,i} + A_3 X_i + A_4 X_{P,i} + A_5 X_{hh,i} + A_7\ \mathrm{HH55} + \mu_{it} \qquad \textbf{(12)}$$

where HH55+ is a binary indicator that takes value one if household *hh* co-resides with an elderly family member, zero otherwise. The X_{it} variables are individual-specific characteristics, while the Z_{it} variables identify the characteristics of the household, the village or the community of the respondents. We model the probability of co-residence with an elderly individual aged 55+ Pr(HH55+=1) by means of a latent variable model where the decision to co-reside depends on an observable "net utility" that depends on a set of variable groups describing the characteristics of the extended family of the elderly, characteristics of the adults living in a specific household and community norms:

$$Prob(HH55+=1)=f(B_1X'_{C,i}+B_3X'_i + B_4X'_{P,i} + B_5X'_{hh,i} +\mu_{2v}) \quad \textbf{(13)}.$$

Note that the correlation between μ_{it} and μ_{2t} is likely to be non-zero whenever there are unobservable characteristics that can affect both a child's school achievement and the decision of a household to co-reside with elderly household members. The identification of the econometric model (12)-(13) relies on the use of additional right hand side variables in specification (13) that are not used in the school achievement equation (12). In particular we use a set of *family-level* variables $X'_{hh,i}$, with $X'_{hh,I}$ different from $X_{hh,i.}$, to gain information on the parental siblings (whether they are alive, married, educated) and the potential intra-family competition for caring responsibilities towards the elderly that leads to a particular co-residence outcome as made evident by the indicator variable $(HH55+=0,1)$. See the list of variables contained in the vector $X'_{hh,i}$ in the section "Information about parents' siblings" in Table A1, Appendix A, and the corresponding summary statistics in Table A2.

The second approach is to think of the household with co-residing elderly as a selected group of households. It is reasonable to expect that the probability of observing a household with a co-residing person older than fifty five (in 2007) is not randomly distributed in a sample of Indonesian households, but it depends on a complex set of family, financial and cultural reasons. We therefore model the impact of the selection process governing the decision to co-reside as a Heckman selection process. The second stage child schooling variable is identified by the exclusion of variables relating to sibling characteristics. Table 1 reports the results of these estimations, which we comment on in the next section.

4.3 Dealing with the strategic dimension of intra-household caring decisions: alternative sampling strategies

Within a household, each adult may strategically allocate a proportion of total daily time T between caring for children and caring for the household's elderly *vis-à-vis* other co-residing members in order, say, to appropriate a larger share of a bequest **b**. We deal with strategic interaction which takes place at the household level when adults choose the levels of care to devote to the elderly and children, via sample restriction strategies (i) and (ii):

(i) Use of a subsample of *two-ways* main care providers, namely individuals who are identified as the main care providers for both children and the elderly co-residing in the same household. Clearly the intra-household strategic interaction among care providers is absent in these households. As a result, this sample is able to provide very accurate information about claims on present and future returns from caring activities. The drawback of using a sample restriction strategy to identify the role of the focal right hand side variables is that it imposes a severe reduction in the number of observations. The sample comprises 281 households for which we have information about children's school achievement, adults' time spent caring for elderly household members and adults' time spent working, as well as all relevant explanatory variables.[7]

(ii) Use of a *panel of households* for which co-residence with elderly individuals started in 2000 or earlier, thus potentially covering the entire period 2000—2007. In this way we make sure that whatever the child's school achievement is, this is observable to a household's adults only after the co-residing decision has taken place. This sample comprises 2370 households.

4.4 Econometric strategy

In the simultaneous-equation model (9)-(11), there are four sets of explanatory variables that are potentially endogenous. Elderly health measures are potentially endogenous since any unobservable household (or family) characteristics can be considered an input in a health production function and, as such, correlated with actual elderly health. Secondly, the wage earned by a carer may be endogenous, since observable and unobservable characteristics of the carer impact upon his/her labour market opportunities. The third set of potentially endogenous variables is the price of care, which enters our model via its comparison with the carer's wage

[7] While the use of a sample of only-children (adult carers who don't have any siblings) would be probably a better way to test the robustness of our results in the face of limited strategic interaction with competitors for the elderly bequest, this sample contains only three observations).

$w_{2,t} \leq P_{cg}^{m}$. Table A2 reports summary statistics for the instrumental variables used in this study. Hausman tests for endogeneity supported instrumenting for all of these variables. Specifically, we use the Three-Stage-Instrumental-Variables methodology to estimate the system of equations (9)-(11).

To instrument for the carer's wage and its comparison with the price of care, we use province dummy variables, the difference of the average province-specific wage with respect to the wage in Java and cell-specific wages (where a cell is defined by a constant education level and province), which are computed using the 2000 Indonesian Census. Information on community characteristics such as the presence of public transport in 2000, the number of factories hiring in 2000 and the occurrence of natural disasters in the last five years (2002—2007) are potentially good instruments as they determine a totally exogenous sample variation in the labour market opportunities of adult carers (see Appendix B for details on natural disaster variables and sources).

To instrument for the health of the elderly, we rely on the often found correlation between their health and variables such as gender, past educational achievements and elderly marital status. Specifically, we use the number of elderly co-residing in each household in 2000, the percentage of these co-residing elderly who are female, the percentage of these co-residing elderly who are married, and the average age of the elderly co-residing in 2000, to proxy for the caring demands that adults face in households with coresiding elderly. Province specific dummy variables for the location of the household are also included to control for the economic development of the province relative to Java. Instruments for the health of the elderly that are incontrovertibly exogenous are community norms that regulate gift exchange across generations. The partial R^2s for each endogenous explanatory variable, which are calculated following Shea (1997), vary between 10 and 65 percent. This suggests that in most cases our instruments are relevant (but not too relevant) and exogenous. Finally, in estimating the model of within-household "care" resource allocation, we do not impose any restrictions (symmetry or other) across equations.

5. Variable description

We investigate the way in which various factors impact upon co-residing adults' time allocation. We focus on elders' bequests and the prevailing norms that guide the distribution of this bequest among competing claimants (siblings) on one hand, future children's wages and

appropriability of such incomes on the other hand. To focus on one effect of children's care by adults, namely school achievements, we restrict our attention to households with children aged 7—14 years old in 2007, as these children were 0—7 years old in 2000 and therefore excluded from the Indonesian school system in 2000. In this way we can rule out that any delayed educational achievements observed in 2007 were the result of the past occurrence of retarded school achievements rather than of household characteristics and decisions occurring between 2000 and 2007. We empirically model children's school attainment as adults' human capital investment decisions. From the IFLS-4 questionnaire we construct a child-specific measure of distance between the actual school grade the child is currently achieving and the maximum school grade this child should be achieving if s/he had progressed regularly in his/her school achievements. In particular, a `distance' variable was constructed for each child, using the number of years of schooling completed by the child (Schooling) and their age, as in the formula below:

$$Distance = \left[\frac{Schooling - (Age - 7)}{Age - 7}\right] * 52$$

Clearly, negative values indicate a gap between actual schooling and what it should be in the absence of any delay in school achievement. We use this information to define a dummy variable $Grade\ for\ age = 1$ if "distance"=0, zero otherwise. The $Grade\ for\ age$ variable is thus a binary measure of the child's schooling progression and indicates whether the child is behind in their schooling (=zero) or is at the desired level for their age (=1). This measure of schooling outcomes takes into account all of the available information on school attendance and drop out, and gives us an indication of those children who may have fallen behind in schooling attainment. We define as 'elderly' those persons who were over 55 years of age in 2007. Each elderly individual is asked the number of hours of care that he/she receives by the main adult care provider co-living in the same household. Identification of the main care provider for both children and elders co-residing in a given household is paramount for our identification strategy and it allows us to merge information about the main care providers with information about a child, the elder, the household and the norms prevailing in the community where the household is situated.

5.1 The Main Explanatory Variables

Table A1 and Table A2 in Appendix A I report description and summary statistics for all variables used in this study. The numerous right hand side variables can be grouped as follows:

Children's characteristics: Child-specific characteristics $X_{C,i}$ of child C co-residing with adult i in household hh impacts upon the intensity of adults' care devoted to human capital accumulation. Controls for a non-linear effect of age and child's gender are included among the explanatory variables.

Care provider's/Parents' characteristics: the set X_i refer to the characteristics of the main care provider i in household hh. We exclude the carer's gender because in the great majority of the cases — over 90 percent of care providers in the most restrictive sample (one main two-way carer) — the carer is the child's mother. We include the education levels $X_{P,i}$ of mothers and fathers among the explanatory variables. The parents' educational levels are combined to generate the following dummy variables: elementary=1 if he/she completed elementary or junior high school; second/college = 1 if the parent completed high school or college; educ_mis = 1 if mother (father) completed no school or mother's educational attainment is missing. The IFLS also provides information about the working status of the child's main carer. The solution of our time allocation problem as illustrated in Section 3 shows that the care provided to elders co-residing in the same household will depend on a comparison between the current wage and the market price of elderly care. For this reason, we include among the explanatory variables a dummy variable, namely *carer_wg<elder,* which takes value 1 if a child's main carer's wage per hour is less than the per hour price of elderly care.[8]

Elders' characteristics $X_{O,i}$*:* we adopt the age (55) as the threshold to define 'elderly' in 2007. This choice is motivated by the following considerations: (i) this is the official retirement age in Indonesia; (ii) life expectancy in Indonesia is around 71. Health shocks affecting the elderly may have important and persistent implications for children's school achievements if these health shocks alter the perception of the opportunity costs associated with caring activities. We measure bad health in the elderly by means of an indicator variable related to the IFLS question *"In general how is your health?"*. The elderly who answered "somewhat unhealthy or unhealthy" to

[8] Note that the market price of elders' care is estimated as the average hourly cost of paid care for the elderly. To compute this average price we use information on hours of paid care per week and on total weekly care cost as reported by elders.

this question were assumed to be in poor health. We stress that the IFLS-3 provides the opportunity to check the robustness of our results, which depends on variations in the health measure used.[9] Our tests (available upon request) confirm the robustness of our findings to changes in the health measure used. From Table A2 we note that relative to the full sample, elderly household members in ill-health are more likely to co-reside with working age adults.

Elders' assets and property rights over such assets $R_{O,i}$*:* while the IFLS does not directly provide information about the size of the bequest that an elder member of the household will potentially leave to his/her carer(s), it does provide information about assets owned by the household elders. Specifically, we include two dummy variables, *elder_asset_own*=1 if at least one elder in the household owns assets outright; and *elder_asset_coown*=1 if at least one elder in the household co-owns assets with other household members.

Social norms regulating elders' assistance from adult children $N_{hh,i}$*:* The modeling carried out in the previous section illustrates that norms governing the transfer of income from younger to older generations may affect an adults' time allocation decisions between competing caring tasks. While we don't explicitly observe the parameter **θ** we introduced in Section 3, we can proxy it by using information on norms governing such transfers. Norms provide implicit codes that regulate the exchange of care/money/time (etc) between household members belonging to different generations. Thus, for example, the responsiveness of the bequest function with respect to the care that elders received from household adults may depend on the existence of a community norm specifying that the caring adult child will receive a larger share of the elder's inheritance. Particularly useful in this respect are the questions asked at the community level: (i) *Caring child inherits*: 'If one child lives with their parents and takes care of them until their death, does this child receive a larger proportion of the inheritance compared to other children?'; (ii) *Caring child house*: 'Will this child that lives with and takes care of their parents receive the parent's house that they are occupying as part of the inheritance?'

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[9] We focus on two other health measures that were asked of respondents aged 55 and above. These are:

(i) Compared to another person of your age and sex, how would you say that your health is?
(ii) How do you expect your health to be next year?

While in (i) IFLS asks for a comparison with peers, (ii) asks the elderly to give a self-assessment of their expectations of ill-health.

We list norms of this kind in the panel titled "***Elders' assistance from adult children"*** in Table A1. These variables are used to proxy for $\pi'(.) > 0$ the responsiveness of the function $\pi = \pi(t_{cg})$ to changes in care for the elderly. Appendix C discusses the nature of these community norms and the sources of these variables.

Household's characteristics $X_{hh,t}$*:* While we are not able to directly proxy for the responsiveness of children's human capital accumulation to their care, an abundant literature has clearly established that children's educational attainment is affected by their parents' time investments. For this reason, the size and composition of the household matter for children's success in school (Downey, 1995). We control for household structure by including the following variables: *child0_6* (the number of children in the household aged 0—6 years), *child7_14* (the number of children aged 7—14 years), *female_wkage* and *male_wkage,* the number of female (male) members of the household of working age, respectively. There are notable differences between the full sample and the subsample that co-reside with elderly family members. For example, working age adults co-residing with elderly individuals are less educated relative to adults in the full-sample. Co-residing adults are also less likely to have pre-school age or school-age children. See Table A1 for details.

Future labour market opportunities and returns to human capital $Z_{hh,t}$. Finally, one important implication of the model above is that prospective better labour market opportunities for children when they reach adulthood should improve children's school attainment, since their parents' opportunity costs of caring for their children decreases. Using census data we have estimated the following variables: the average province-specific monthly age of workers with various education levels (no education, primary education, secondary education, etc), as well as *wg_java,* the average local wage of workers in the province where the family is residing relative to West Java.

6. Empirical results

Table A2 presents the summary statistics for the three samples used in this analysis. The unconditional sample means show that in both the full sample of co-residing households and the "panel" sample of households co-residing with the elderly in both 2000 and 2007, children's school achievement were better than in households in the sample comprising co-residing and non-co-residing households. However, this is not the case in a sample of "two-ways main

carers" where the children's school achievement drops significantly. The number of hours of care in the three samples with co-residing elderly are of course substantially higher than in the full sample, given that only a fraction of the households in the full sample have co-residing elderly. Even the hours of work outside the household are higher in the most restrictive sample of identified two-way main care providers. Table A2 also shows that the four samples substantially differ in the existence and enforcement of community norms that establish a preferential access to bequests by adult children who provide care for their elderly parents.

Our main results are organized in a set of tables: Table 1 discusses the issue of endogeneity of the co-residing decision. Table 2 reports selected estimation results for the child's school achievement equation (equation (10)), obtained using our three main samples (the full sample, the panel sample and the restricted sample of two-ways-care providers). Table 3 compares the school achievement results for children in *economically distressed households and non-distressed households*.

Table 1 clearly illustrates the impact of co-residence with elderly family members on children's school achievements once the endogeneity of the co-residence decision is formally taken into account. As discussed in Section 4, we allow for two different types of endogeneity — through correlation in the error terms and through selection bias — which correspond to a bivariate probit specification and Heckman selection model, in the left hand side and right hand side panel of Table 1, respectively. Importantly, while we find some support for the hypothesis of endogenous co-residence decisions (see Specification I in Table1), we don't find any evidence that co-residence with the elderly *per se* has a negative impact on children's school achievement. If there is any impact on children's educational outcome that derives from co-residence it may come from the set of rewards and constraints that derive from the intra-household distribution of property rights and related social norms.

6.1 Inter-generational intra-household redistribution and school performance

Table 2 illustrates the results for children's educational achievements (the "distance" equation) when they live in households with the elderly (55+ in 2007). There are a number of results to which we need to draw attention. When we use the full sample or the panel sample of households who were co-residing with the elderly in both 2000 and 2007, a child's age impacts significantly on his/her chances to avoid schooling delays, with young children being more prone to schooling delays. Interestingly, a child's age does not matter in the restricted sample of

"two-ways-main care providers". Both Specifications I and II in Table 2 indicate that a child's gender (female) is negatively correlated with school achievements, but again this result disappears in a sample of household with limited competition among the adult care providers.

If we consider the full sample, households where the adult care providers face wages below the price of formal care are those in which the educational achievements of children suffers the most. It is important to keep in mind that this is not the result of poor labour market conditions a household might face, as we control for province-specific conditions by means of province dummy variables. Rather, we interpret this result as emerging from the way adults facing competing caring responsibilities and poor labour market conditions redistribute their time across alternative and competing uses. Thus, for example, the estimation of the set of three equations shows that when $w_{2,t} \leq p_{cg}^{m}$, the adults' hours of work and the hours devoted to elderly care increase leading to the non-surprising result that this event reduces the child's school achievement. Again this statistically significant result becomes non-statistically significant in the smaller samples, while leaving the sign of the coefficient for the indicator variable for $w_{2,t} \leq p_{cg}^{m}$ unchanged.

The presence of needy elderly may have a negative impact on children's school achievement if the distribution of caring resources favors the elderly in response to incentives — large potential bequest and social norms that relate bequest to received care. A full consideration of the three equation model, in fact, reveals that elderly family members reporting poor health require more hours of care. Clearly this allows a potentially negative feedback on the co-residence children's school achievement (see tabulation below extracted from Table2)

IV3SLS estimated coefficient for "Elderly unhealthy" in the "Hours of elderly care" equation, health instrumented. See Table 2 for full specification. In Specification II the social norm "Caring Child Inherits" variable is treated as endogenous (a), *** p<0.01, ** p<0.05, * p<0.1

	(1) *Full Sample*	(2) *s.e.*	(3) *Panel Sample*	(4) *s.e.*	(5) *Two-ways Main Carers*	(6) *s.e.*
Specification I	*4.369***	(2.189)	3.906*	(2.225)	6.693**	(3.008)
Specification II	4.648**	(2.325)	4.493*	(2.320)	6.543**	(3.024)
Observations		4164		2370		281

Notes: (a) See Appendices II and III and Section 6.3 for discussion on the potential endogeneity of the variable "Caring Child Inherits"

Consistent with our model, Table 2 illustrates that, when the full sample is considered, the

property rights elderly household members have over family assets as observed in 2000 reduce co-residing children's school achievements. Property rights that elderly family members hold on household assets deviates time resources away from children's schooling. Equally negative for children's school results is the existence of community norms that relate elderly care to adult children's "rights" to the bequest. Table 2 indicates that a norm regulating the preferential access to a bequest by an adult who provides care to the elderly leads to reduced children's school achievement. The tabulation below reproduces the estimated coefficient of the community norm "Caring Child Inherit" in the three equation model estimated via IV3SLS of Table 2:

IV3SLS estimated coefficients for "Caring Child Inherits" in the three equations, *** p<0.01, ** p<0.05, * p<0.1

EQUATION	*(1) Full Sample*	*(2) s.e.*	*(3) Panel Sample*	*(4) s.e.*	*(5) Two-Ways Main Carers*	*(6) s.e.*
Household hours of care to elderly	0.271	(0.292)	0.497	(0.484)	1.524	(2.078)
Child's school achievement	-1.358*	(0.745)	-2.46***	(0.806)	-11.46***	(2.977)
Carer's working hours	0.860	(1.002)	2.27*	(1.189)	10.50***	(3.607)
Observations	4164		2370		281	

The extract above clearly shows that the existence of such social norms may impact on the time devoted to caring for co-residing children in two ways: (i) by increasing the amount of care devoted to the elderly, and (ii) by increasing the number of working hours, possibly to increase the future care from their children that the current adults will be able to secure by having a larger potential bequest with which to reward their children's caring activities. This second channel through which social norms regulating the transmission of the elderly's bequest to the next generation affect a carer's working hours testifies of the potential endogeneity of the bequest itself.

In general, the household structure significantly impacts on children's schooling. The number of older children and the existence of household financial support improves children's school performance, while surprisingly households' per capita assets do not have any positive impact on children's educational achievement. Having found that indeed a set of norms and monetary incentives bias the allocation of scarce time resources away from children's schooling, we now approach the other central question that motivates this research.

6.2 Is competition for care more severe in economically distressed households?

In Table 3 we disaggregate the full sample of households to ascertain whether there is any substantial difference in the way economically distressed households face competing caring demands towards the very young and the very old who co-reside with adults and children. As discussed previously, the Indonesian financial crisis and subsequent changes in income distribution have adversely affected the ability of households to care for both their household's elderly sick members as well as children. We expect to find that indeed claims, resources and incentives impact differently upon time allocation decisions in households that are economically distressed compared to those households that are not. A number of robustness exercises have been performed. In Table 3we use "income below the median" and "assets per capita below the median" as our indicators of a distressed household in the left hand side and right hand side of the table, respectively.

Both specifications provide some evidence of differences in the way competition for care in distressed and less distressed households may affect a child's schooling achievement. The main differences are in terms of the signs of key explanatory variables and the statistical significance of the explanatory variables. The first point to note is that a child's school achievement increases with his/her age particularly in non-distressed households, while being a female child impacts negatively in distressed households when distress is evaluated using the distribution of assets rather than the income distribution.[10] Property rights on assets held by the elderly deviate time resources away from children, particularly in less distressed households, where these assets are likely to be large. Conversely, community norms that assign claims on a bequest to the caring adult child matter for the allocation of time resources, particularly in income-distressed households where this variable impacts negatively on children's school achievement. Finally, it appears that the help that children receive from older children (those aged 7—14) is particularly useful in boosting their chances of good school achievement in both distressed and less distressed households.

We test the robustness of these results by alternatively defining as distressed the households whose income is below the 25th percentile of the income (assets) distribution and comparing these results with those obtained by using a sample of households whose incomes (assets) are above the 75th percentile of the income distribution. These results are available upon request. In

10 This is consistent with a recent study by Suryadarma et al (2009) that finds evidence of orphanhood having a more adverse effect on girl's education relative to boys in Indonesia.

general, these results confirm the importance of economic distress for the relevance of community norms and monetary incentives in the time allocation decisions of adult care providers when they face multiple caring tasks.

6.3 Investigating the hypothesis of endogenous enforcement of social norms.

Given the relevance of social norms that regulate the transmission of inheritance from elderly to adults and the competition for care between the elderly and children that may arise in the face of potential bequests for caring adults, we may be concerned about the potential endogeneity of community norms such as those captured by the "Caring_Child_Inherit" variable. Notice that questions related to the *existence* of community norms were asked of the village chief. Thus by nature and by survey design, community norms are exogenous to the intra-household decision making regarding care. However, the *decision to enforce* such community norms could be endogenously determined. To investigate the possible endogeneity of enforcement of a community norm such as "*Caring Child Inherits*", Appendix D reports the summary statistics of this response in the 1997 and 2007 IFLS surveys (community norms questions were not included in the 2000 survey). The tables in Appendix D indicate that the IFLS statistics for community norms were almost identical in 1997 and 2007. However, the restricted sample of "two-ways main carers" is interesting: compared to the other samples, a higher proportion of communities agree with *Caring child inherits* in 2007 versus 1997, which supports the hypothesis of the potential endogeneity of this variable. We formally investigate the potential endogeneity of the "*Caring child inherits*" variable in Appendix D, which also reports Wald and Hausman tests, using a comparison between *Probit and Instrumental Variable Probit* estimation results for "elderly co-residence". Instrumental variables used in the IVProbit specification are the variables that capture the structure of the extended family of siblings who are the potential carers for the family's elderly (parents or other adults). The Wald test and the Hausman tests of exogeneity reject the null hypothesis at the 99 percent level of confidence.

Tables 5 and 6 report results for the school achievement equation using instrumental variables for the community norm "*Caring Child Inherits*". Thus, Table 5 and Table 6 mirror the specifications used for Table 2 and Table 3, respectively, but take into account the endogeneity of the community norm variable. Our main finding is the robustness of the size and statistical significance of the community norm "*Caring Child Inherits*" coefficients. Even when the

potential endogeneity of "*Caring Child Inherits*" is taken into account, we find that the existence and enforcement of this community norm has a negative impact on children's school achievement. As both Table 2 and Table 5 show, this impact is particularly large when we estimate our model using a restricted sample of "*two-ways main carers"* (Specification III)*,* i.e., in households where uncertainty over the beneficiaries of this norm is reduced given the presence of only one main care provider.

6.4 Robustness exercises.

We carried out a large number of robustness exercises to test the findings reported in this paper, primarily whether elderly property rights over family assets, and social norms regulating bequests, have a significant impact on children's school achievements. Table 7 reports the results for a limited set of cases, all involving the use of the full sample of co-residing households (4164 observations) except Specification VI. Two other sets of robustness exercises using the two samples of 2370 and 281 observations, respectively, are available upon request. Specification I reports the main results obtained using the responses to the 1997-Community Norms IFLS questionnaire: while "*Caring child inherits*" becomes non-statistically significant, again pointing to the potential endogeneity of the corresponding 2007 social norm variable, all of the remaining results are unchanged.

Both Specifications II and III include in the group of right hand side variable an interaction term between the advanced age of household elderly (70+) and the social norm *Caring child inherits*. In particular, Specification II, where the social norm is treated as exogenous, shows that the interaction variable is statistically significant and negative at the 10 percent level, while the social norm variable is not. These results indicate that when the prospect of a bequest is closer in time, bequest regulating social norms may be more effective. In Specification III, however, the relevant variables become non-statistically significant.

Between 1973 and 1979 the Indonesian Government constructed 61,000 primary schools. This increased the number of children attending school by 2 per 1000 children aged 5 to 14 in 1971 (Duflo, 2001). This policy affected individuals aged 28—32 in the year 2000, and has been shown to have significantly increased the educational attainment of this age group (Duflo, 2001). The higher educational attainment of these parents aged 28—32 in the year 2000 may considerably impact on their children's educational attainment. For example, if the "productivity" of adult parents' efforts in the human capital production function also depends on the parents' education level, a dummy variable for parents in this age group should significantly shift upward children's school

performance. To capture this effect, Specifications IV and V use the standard specifications, as in the other tables, but add a dummy variable which equals one if the parents' age was in the range 28—32 in 2000, zero otherwise. Table 7 shows that while all of the relevant variables remain statistically significant, the interaction variable *(Caring Child Inherits)*Parent28_32* is positively signed in both Specifications IV and V. Taken together with the result that *Caring Child Inherits* and *(Caring Child Inherits)*Parent28_32* are jointly statistically significant in Specification V, these results support our argument regarding the importance of the channel of transmission of the value of education across generations. The last specification in Table 7 considers variables for the Minang ethnicity of the adult parents of a household. The Minang ethnic group is known for its traditional practice of matrilineal succession, whereby inheritance goes to daughters.[11] It is expected that in these communities the statistical significance of the community norms *Caring child inherits* is weakened. Consistent with this prediction, Table 7 illustrates that *Caring child inherits* becomes non-statistically significant in specification VI.

7. Conclusions.

The dramatic shift in age structure that many low and middle income countries in the Asia—Pacific region will experience over the next thirty years was set in motion by a decline in fertility levels and falling death rates in the early 1970s. These changes in age structure and consequent population ageing are affecting economic and social aspects of life, including financial security, employment, living arrangements, and health care. This paper addresses an overlooked aspect of the existing literature on investments in human capital in low and middle income countries by asking whether a household's reallocation of time and resources due to the presence of elderly co-residents impacts upon the schooling achievements of younger household members. We find robust support for the idea that in three-generation households, where adults co-reside with both elderly household members and children, households allocate scarce time resources in a way that is sensitive to the set of constraints and rewards that caring activities entail. The main results are summarized as follows:

(i) A set of monetary incentives and community norms are shown to have an important

[11] Approximately 4 percent of the IFLS 2007 individuals and households are from the Minang ethnic group (see Book K, module AR1), and this percentage remains consistent in our sample of *Co-residing and Non-co-residing* households (9170). *Table 2* illustrates that the percentage of the children's parents who are Minang also remains around 3—4 percent in our *Full Sample* (4164) and *Panel Sample* (2370), however it increases slightly to 6—7 percent in the *Two-way Carer Sample* (281).

influence on the allocation of caring resources among competing uses; in our case, care for the household's children and elderly. Limited labour market wage opportunities relative to the cost of formal elderly care significantly divert resources away from children (and children's school performance).

(ii) We find that community norms regulating the division of an elderly parent's bequest among possibly competing adults significantly reduces children's school performance. This result is robust to a large number of tests.

(iii) Monetary incentives and community norms do not have the same affect on economically "distressed" or less distressed household. While family assets owned by the elderly reallocate resources away from children in less-distressed households, community norms may be more relevant in economically distressed households.

This paper also stresses the complexity of intra-household time allocation decisions. There are a number of results that future work will need to further explore, namely the potential endogeneity of fertility, and so the family structure in households where three generations live together, and the possibility that adults' savings (and future bequests) responds to social norms regulating the transmission of elderly bequests to adult children.

The main conclusions that we can draw from this study are twofold. The first one draws upon the findings that social norms linking bequests to care for the elderly may produce negative effects on children's school achievements. We have interpreted this result in light of the likely competition for scarce care resources that such community norms trigger. The second conclusion is an invitation to assist families with ageing household members by means of policies that are attentive to the way economic distress interplays with the economic and cultural norms and constraints that families face.

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Appendix A: NOT FOR PUBLICATION

Table A1: Variable Definitions

Variable Name	Definition	IV3SLS Status
Dependent Variables		
Hours of unpaid care by elders' children	Total unpaid care per week to all household elderly by all their coresiding children (missing variables captured by *cores_mis*, below)	Endogenous
Hours of unpaid care toe elders by child's carer	Hours per week unpaid care to coresiding elderly by child's main carer (missing variables captured by *cores_mis*, below)	Endogenous
Grade for age	Dummy variable = 1 if child is at the school level desired for their age	Endogenous
Grade for age missing	Dummy variable = 1 if *grad_for_age* is missing	Endogenous
Distance	Number of weeks between child's actual school level and the desired level for their age	Endogenous
Distance missing	Dummy variable = 1 if *distance* is missing	Endogenous
Hours work/wk by child's carer	Average weekly hours for which the child's main carer worked in 2007	Endogenous
Hours work/wk missing	Dummy variable = 1 if *carer_hours_wk* is missing	Endogenous
Sample Selection Variables		
One carer for child and elderly	Dummy variable = 1 if the same person cares for both child and elderly	3SLS Sampling
One carer for child and elderly missing	Dummy variable = 1 if *one_carer* is missing	3SLS Sampling
Elderly coresident in 2007	Dummy variable = 1 if elderly coresident in 2007	3SLS Sampling
Elderly coresident in 2007 missing	Dummy variable = 1 if *cores* is missing	3SLS Sampling
Years of elderly coresidence	Years between 2000 and 2007 for which at least one elder coresided	3SLS Sampling
Years of elderly coresidence missing	Dummy variable = 1 if *yrs_cores* is missing	3SLS Sampling
Carer Variables		
Child's main carer's wage p/hr < p/hr price of elderly care	Dummy variable = 1 if child's main carer's wage per hour is less than the per hour price of elderly care	Endogenous
Child's main carer's wage o/hr is missing	Dummy variable = 1 if *carer_wg<elder* is missing	Endogenous
Child Characteristics		
Child age	Child age	Exogenous
Child age2	Child age squared	Exogenous
Child is female	Dummy variable = 1 if child is female	Exogenous
Elders' Characteristics		
At least one elder in hh somewhat unhealthy or unhealthy	Dummy variable = 1 if at least one household elder is somewhat unhealthy or unhealthy in 2007	Endogenous
Elderly health missing	Dummy variable = 1 if *elder_unhth* missing	Endogenous
Elderly own assets	Dummy variable = 1 if at least one elder in the household owns assets outright in 2000	Exogenous
Elderly own assets missing	Dummy variable = 1 if *elder_asset_own* is missing	Exogenous
Elderly need financial helps from children	Dummy variable = 1 if at least one elder in the household in 2007 expects they will need financial help from his/her child in next 5 years	Exogenous
Elderly expect to receive financial assistance from children	Dummy variable = 1 if at least one elder in the household in 2007 expects to receive financial help from his/her child in next 5 years	Exogenous Exogenous
Elderly expect to leave bequest to children	Dummy variable = 1 if at least one elder in the household in 2007 expects to leave a bequest to one of his/her children	Exogenous
Elder info missing	Dummy variable = 1 if elder information is missing but elders coreside	Exogenous
Community Norms		
Norm: Elderly live with children	Dummy Variable = 1 if there is a community norm that elderly usually live with their children (1997 and 2007 variables)	Exogenous
Norm: Elderly live with children missing	Dummy Variable = 1 if *livewith_children* is missing (1997 and 2007 variables)	Exogenous
Norm: Children care for elderly parents	Dummy Variable = 1 if there is a community norm that children care for elderly parents (1997 and 2007 variables)	Exogenous
Norm: Children care for elderly parents missing	Dummy Variable = 1 if *children_care* is missing (1997 and 2007 variables)	Exogenous

Norm: Caring child inherits more	Dummy variable = 1 if there is a community norm that the caring child receives more inheritance (1997 and 2007 variables)	Exogenous*
Norm: Caring child inherits house	Dummy variable = 1 if there is a community norm that the caring child receives the parents' house (1997 and 2007 variables)	Exogenous
Norm: Caring child norms missing	Dummy variable = 1 if *caring_inherit…* is missing (1997 and 2007 variables)	Exogenous
Mother's education and work		
Mother completed elementary school	Dummy variable = 1 if the mother completed elementary school (2007 variable)	Exogenous
Mother completed junior high school	Dummy variable = 1 if the mother completed junior high school (2007 variable)	Exogenous
Mother completed elementary or junior high school	Dummy variable = 1 if mother completed elementary school or junior high school (aggregation) (2000 variable)	Exogenous
Mother completed highschool/college	Dummy variable = 1 if mother completed high school or college (2000 and 2007 variables)	Exogenous
Mother completed no school / missing	Dummy variable = 1 if mother completed no school or mother's educational attainment is missing (2000 and 2007 variables)	Exogenous
Mother works	Dummy variable = 1 if the mother worked in the past year (2007 variable)	Exogenous
Mother works missing	Dummy variable = 1 if *mother_work* is missing	Exogenous
Father's education and work		
Father completed elementary school	Dummy variable = 1 if the father completed elementary school (2007 variable)	Exogenous
Father completed junior high school	Dummy variable = 1 if the father completed junior high school (2007 variable)	Exogenous
Father completed elementary or junior high school	Dummy variable = 1 if father completed elementary school or junior high school (aggregation) (2000 variable)	Exogenous
Father completed highschool/college	Dummy variable = 1 if father completed high school or college (2000 and 2007 variables)	Exogenous
Father completed no school / missing	Dummy variable = 1 if father completed no school or father's educational attainment is missing (2000 and 2007 variables)	Exogenous
Father works	Dummy variable = 1 if the father worked in the past year (2007 variable)	Exogenous
Father works missing	Dummy variable = 1 if *father_work* is missing	Exogenous
Child's main carer's education		
Carer completed elementary school	Dummy variable = 1 other carer completed elementary or junior high school by 2007	Instrument
Carer completed highschool/college	Dummy variable = 1 other carer completed high school or college by 2007	Instrument
Carer completed no school / missing	Dummy variable = 1 other carer completed no school by 2007 or educational attainment is missing	Instrument
Household details		
# children aged 0-6	Number of children in the household aged 0-6 years in 2007	Exogenous
# children aged 7-14	Number of children in the household aged 7-14 years in 2007	Exogenous
# children aged 0-14	Number of children in the household aged 0-14 years in 2007 (aggregation)	Exogenous
# working age females (15-54)	Number of working age females (15-54) in the household	Exogenous
# working age male (15-54)	Number of working age males (15-54) in the household	Exogenous
Household assets	Log (value in R of non-business assets owned by household members) in 2000	Exogenous
Average assets per household member	Log(average value of assets per household member) in 2000	-
Household assets missing	Dummy variable = 1 if *asset…* are missing	Exogenous
Average income per household member	Log(income in R per household member) in 2000	'Distress'
Average income per household member missing	Dummy variable = 1 if *income_ave* is missing	'Distress' Sampling
Standard of Living fell in past 5 years	Dummy variable = 1 if the mother reports in 2007 that the household's standard of living is less than 5 years ago	'Distress' Sampling
Standard of Living past 5 years missing	Dummy variable = 1 if *sol_LT5yrs* is missing	'Distress' Sampling
Household has health card (2007)	Dummy variable = 1 if household holds a health card in 2007	-
Health card missing	Dummy variable = 1 if *health_card* is missing	-
Assistance to/from parents' siblings		

Norm: Caring child assisted by siblings	Dummy variable = 1 if there is a community norm that the elderly usually live with their children (1997 and 2007 variables)	Exogenous
Norm: Caring child assisted by siblings missing	Dummy variable = 1 if *norm_cores* is missing (1997 and 2007 variables)	Exogenous
Parents support siblings	Dummy variable = 1 if mother or father give financial support to siblings	Exogenous
Receive support from other siblings	Dummy variable = 1 if mother or father receive support from siblings	Exogenous
Support from siblings is missing	Dummy variable = 1 if *parent_supp_sibling* or *sibling_supp_parent* is missing	Exogenous
Information about parents' siblings		
# siblings alive	Number of siblings alive in 2000 (separate mother and father variables)	Instrument
# siblings alive missing	Dummy variable = 1 if *sib_alive* is missing	Instrument
# siblings male	Number of siblings who are male in 2000 (separate variables for mother and father)	Instrument
# siblings female	Number of siblings who are female in 2000 (separate variables for mother and father)	Instrument
# siblings who work	Number of siblings who work in 2000 (separate variables for mother and father)	Instrument
# siblings single	Number of siblings who are single in 2000 (separate variables for mother and father)	Instrument
# siblings married	Number of siblings who are married in 2000 (separate variables for mother and father)	Instrument
# siblings other marital status	Number of siblings who have another marital status in 2000 (separate variables for mother and father)	Instrument
Sibling info missing	Dummy variable = 1 if other sibling's work or marital information is missing (separate variables for mother and father)	Instrument
Socio-economic information		
Ave_w_prim_ratio	Ratio of average monthly wage in state of workers with primary education to workers with no education (2007 variable)	Exogenous
Ave_w_junhigh_ratio	Ratio of average monthly wage in state of workers with junior high school education to workers with no education (2007 variable)	Exogenous
Ave_w_highmore_ratio	Ratio of average monthly wage in state of workers with high school or higher education to workers with no education (2007 variable)	Exogenous
Average local wage relative to West Java	Average local wage relative to West Java	Exogenous
Average local wage missing	Dummy variable = 1 if *wg_java* is missing	Exogenous
Rural	Dummy variable = 1 the household is in a rural area	Exogenous
Rural missing	Dummy variable = 1 if *rural* is missing	Exogenous
Public transport	Dummy variable = 1 if public transport is available in the community in 2000	Instrument
Public transport info missing	Dummy variable = 1 if *public_transport* is missing	Instrument
Number of industries hiring	Number of cottage industries in village hiring in 2000	Instrument
Number of industries hiring missing	Dummy variable = 1 if *number_hiring* is missing	Instrument
Farm wage	Log (maximum farm wage) in village in 2000 (separate variables for male and female)	Instrument
Farm wage missing	Dummy variable = 1 if *farm_wage* is missing (separate variables for male and female)	Instrument
Factory wage	Log (maximum factory wage) in village in 2000 (separate variables for male and female)	Instrument
Factory wage missing	Dummy variable = 1 if *factory_wage* is missing (separate variables for male and female)	Instrument
Disasters in household's area		
Disaster in the past 5 years	Dummy variable = 1 if in 2007 there was a natural disaster (including civil strife) in the household's area in the past 5 years	Instrument
Disaster in the past 5 years missing	Dummy variable = 1 if *Disaster in past 5 years* is missing	Instrument
Frequency of disaster	Number of times a disaster occurred in the past five years	Instrument
Frequency of disaster missing	Dummy variable = 1 if *Disaster in past 5 years* is missing	Instrument
Years since disaster	Number of years since the most severe disaster occurred	Instrument
Years since disaster missing	Dummy variable = 1 if *Years since disaster* missing	Instrument
Repairs due to disaster	Dummy variable = 1 if there house underwent repair / renovation since 2000 due to a disaster	Instrument
Repairs due to disaster missing	Dummy variable = 1 if *Repairs due to disaster* is missing	Instrument

Province Information		
North Sumatra	Dummy variable = 1 if household is in North Sumatra	Instrument
West Sumatra	Dummy variable = 1 if household is in West Sumatra	Instrument
South Sumatra	Dummy variable = 1 if household is in South Sumatra	Instrument
Lampung	Dummy variable = 1 if household is in Lampung	Instrument
Jakarta	Dummy variable = 1 if household is in Jakarta	Instrument
East java	Dummy variable = 1 if household is in East Java	Instrument
West Java	Dummy variable = 1 if household is in West Java	Instrument
Central Java	Dummy variable = 1 if household is in Central Java	Instrument
Yogyakarta	Dummy variable = 1 if household is in Yogyakarta	Instrument
Bali	Dummy variable = 1 if household is in Bali	Instrument
Nusa Tenggara Barat	Dummy variable = 1 if household is in Nusa Tenggara Barat	Instrument
North Sumatra	Dummy variable = 1 if household is in North Sumatra	Instrument
South Sulawest	Dummy variable = 1 if household is in South Sulawest	Instrument
Robustness variables		
At least one elder aged 70+	Dummy variable = 1 if at least one elder in household is 70 years of age or older in 2007	Exogenous
*Caring child inherits * At least one elder aged 70+*	Dummy variable = 1 if *elder_70* =1 and *caring_inherit* =1	Exogenous*
Mother is Minang	Dummy variable = 1 if mother is from Minang ethnic group (practice matrilineal succession)	Exogenous
Mother Minang missing	Dummy variable = 1 if *mother_minang* is missing	Exogenous
Father is Minang	Dummy variable = 1 if father is from Minang ethnic group (practice matrilineal succession)	Exogenous
Father Minang missing	Dummy Variable = 1 if *father_minang* is missing	Exogenous

* *Caring Child Inherits* and its interactions were made endogenous for robustness tests. 'Exogenous' instruments appeared in both the right hand side and instrument list of the IV3SLS models. 'Instruments' appeared only in the instrument list. 'Distress Sampling; variables were used for sample selection in the 'Economic Distress' investigations.

Table A2: Summary Statistics

	Cores & Non-Cores Sample N = 9170				***Full Sample N = 4164***				***Panel Sample N = 2370***				***Two-way carer N = 281***			
Dependent Variables	**Mean**	**S.D**	**Min**	**Max**	**Mean**	**S.D.**	**Min**	**Max**	**Mean**	**S.D.**	**Min**	**Max**	**Mean**	**S.D.**	**Min**	**Max**
Hours of unpaid care by elders' children	0.68	5.98	0	169	1.20	7.47	0	169	2.03	9.76	0	169	7.33	14.59	0	98
Hours of unpaid care to elders by child's carer	0.21	2.77	0	98	0.47	4.09	0	98	0.76	5.33	0	98	6.96	14.28	0	98
Grade for age	0.44	0.50	0	1	0.48	0.50	0	1	0.49	0.50	0	1	0.48	0.50	0	1
Grade for age missing	0.01	0.11	0	1	0.02	0.12	0	1	0.01	0.12	0	1	0.01	0.10	0	1
Distance	-5.00	18.97	-468	52	-4.03	19.08	-468	52	-3.95	16.61	-104	52	-5.81	21.45	-104	52
Distance missing	0.42	0.49	0	1	0.42	0.49	0	1	0.48	0.50	0	1	0.24	0.43	0	1
*Hours work/wk by child's carer**	16.73	25.59	0	402	15.64	24.37	0	402	13.23	24.12	0	402	21.17	26.09	0	144
Hours work/wk missing	0.45	0.50	0	1	0.56	0.50	0	1	0.63	0.48	0	1	0.43	0.50	0	1
Sample Selection Variables																
One carer for child and elderly	0.03	0.17	0	1	0.07	0.25	0	1	0.11	0.31	0	1	1.00	0.00	1	1
One carer for child and elderly missing	0.92	0.27	0	1	0.82	0.39	0	1	0.70	0.46	0	1	0.00	0.00	0	0
Elderly coresident in 2007	0.51	0.50	0	1	1.00	0.00	1	1	1.00	0.00	1	1	1.00	0.00	1	1
Elderly coresident in 2007 missing	0.00	0.00	0	0	0.00	0.00	0	0	0.00	0.00	0	0	0.00	0.00	0	0
Years of elderly coresidence	2.17	3.18	0	7	4.24	3.32	0	7	7.00	0.00	7	7	6.45	1.82	0	7
Years of elderly coresidence missing	0.04	0.19	0	1	0.07	0.26	0	1	0.00	0.00	0	0	0.02	0.16	0	1
Carer Variables																
Child's main carer's wage p/hr < p/hr price of elderly care	0.09	0.28	0	1	0.09	0.28	0	1	0.07	0.26	0	1	0.13	0.34	0	1
Child's main carer's wage o/hr is missing	0.73	0.44	0	1	0.82	0.38	0	1	0.85	0.36	0	1	0.79	0.41	0	1
Child Characteristics																
Child age	10.82	2.60	7	15	10.54	2.31	7	14	10.58	2.33	7	14	10.71	2.30	7	14
Child age2	123.80	57.03	49	225	116.54	48.93	49	196	117.34	49.28	49	196	120.02	49.11	49	196
Child is female	0.49	0.50	0	1	0.50	0.50	0	1	0.50	0.50	0	1	0.50	0.50	0	1
Elders' Characteristics																
At least one elder in hh somewhat unhealthy or unhealthy	0.08	0.27	0	1	0.16	0.36	0	1	0.26	0.44	0	1	0.49	0.50	0	1
Elderly health missing	0.63	0.48	0	1	0.27	0.44	0	1	0.00	0.00	0	0	0.00	0.00	0	0
Elderly own assets	0.10	0.30	0	1	0.15	0.36	0	1	0.15	0.36	0	1	0.16	0.37	0	1
Elderly own assets missing	0.28	0.45	0	1	0.38	0.49	0	1	0.42	0.49	0	1	0.31	0.46	0	1
Elderly need financial helps from children	0.18	0.38	0	1	0.34	0.47	0	1	0.57	0.50	0	1	0.81	0.39	0	1
Elderly expect to receive financial assistance from children	0.19	0.39	0	1	0.36	0.48	0	1	0.60	0.49	0	1	0.84	0.37	0	1

Elderly expect to leave bequest to children	0.18	0.38	0	1	0.35	0.48	0	1	0.58	0.49	0	1	0.75	0.43	0	1
Elder info missing	0.63	0.48	0	1	0.27	0.44	0	1	0.00	0.00	0	0	0.00	0.00	0	0
Community Norms																
Norm: Elderly live with children (2007)	0.45	0.50	0	1	0.48	0.50	0	1	0.52	0.50	0	1	0.57	0.50	0	1
Norm: Elderly live with children (2007) missing	0.32	0.47	0	1	0.26	0.44	0	1	0.22	0.41	0	1	0.12	0.32	0	1
Norm: Children care for elderly parents (2007)	0.66	0.47	0	1	0.71	0.45	0	1	0.76	0.43	0	1	0.87	0.34	0	1
Norm: Children care for elderly parents (2007) missing	0.32	0.47	0	1	0.26	0.44	0	1	0.22	0.41	0	1	0.12	0.32	0	1
Norm: Caring child inherits more (2007)	0.23	0.42	0	1	0.25	0.43	0	1	0.28	0.45	0	1	0.38	0.49	0	1
Norm: Caring child inherits house (2007)	0.24	0.43	0	1	0.26	0.44	0	1	0.28	0.45	0	1	0.39	0.49	0	1
Norm: Caring child norms (2007) missing	0.32	0.47	0	1	0.26	0.44	0	1	0.22	0.41	0	1	0.12	0.32	0	1
Norm: Elderly live with children (1997)	0.53	0.50	0	1	0.55	0.50	0	1	0.55	0.50	0	1	0.65	0.48	0	1
Norm: Elderly live with children (1997) missing	0.22	0.42	0	1	0.21	0.41	0	1	0.20	0.40	0	1	0.12	0.33	0	1
Norm: Children care for elderly parents (1997)	0.77	0.42	0	1	0.79	0.41	0	1	0.80	0.40	0	1	0.88	0.33	0	1
Norm: Children care for elderly parents (1997) missing	0.22	0.42	0	1	0.21	0.41	0	1	0.20	0.40	0	1	0.12	0.33	0	1
Norm: Caring child inherits more (1997)	0.25	0.44	0	1	0.27	0.44	0	1	0.29	0.45	0	1	0.33	0.47	0	1
Norm: Caring child inherits house (1997)	0.36	0.48	0	1	0.37	0.48	0	1	0.39	0.49	0	1	0.49	0.50	0	1
Norm: Caring child norms (1997) missing	0.23	0.42	0	1	0.21	0.41	0	1	0.20	0.40	0	1	0.12	0.33	0	1
Mother's education and work																
Mother completed elementary school (2007)	0.38	0.49	0	1	0.34	0.47	0	1	0.30	0.46	0	1	0.42	0.49	0	1
Mother completed junior high school (2007)	0.16	0.36	0	1	0.13	0.34	0	1	0.12	0.33	0	1	0.15	0.36	0	1
Mother completed highschool/college (2007)	0.25	0.43	0	1	0.21	0.41	0	1	0.20	0.40	0	1	0.24	0.43	0	1
Mother completed no school / missing (2007)	0.16	0.37	0	1	0.26	0.44	0	1	0.33	0.47	0	1	0.14	0.34	0	1
Mother works (2007)	0.57	0.49	0	1	0.56	0.50	0	1	0.54	0.50	0	1	0.60	0.49	0	1
Mother works missing (2007)	0.05	0.22	0	1	0.07	0.26	0	1	0.07	0.26	0	1	0.06	0.24	0	1
Mother completed elementary or junior high school (2000)	0.50	0.50	0	1	0.44	0.50	0	1	0.40	0.49	0	1	0.50	0.50	0	1
Mother completed highschool/college (2000)	0.23	0.42	0	1	0.19	0.39	0	1	0.19	0.39	0	1	0.20	0.40	0	1
Mother completed no school / missing	0.27	0.45	0	1	0.36	0.48	0	1	0.41	0.49	0	1	0.30	0.46	0	1
Father's education and work																
Father completed elementary school (2007)	0.31	0.46	0	1	0.27	0.44	0	1	0.24	0.42	0	1	0.34	0.47	0	1
Father completed junior high school (2007)	0.13	0.33	0	1	0.11	0.31	0	1	0.11	0.31	0	1	0.10	0.30	0	1
Father completed elementary or junior high school (2000)	0.29	0.46	0	1	0.23	0.42	0	1	0.21	0.41	0	1	0.23	0.42	0	1
Father completed no school / missing (2007)	0.23	0.42	0	1	0.36	0.48	0	1	0.42	0.49	0	1	0.32	0.47	0	1

Father works (2007)	0.84	0.37	0	1	0.77	0.42	0	1	0.76	0.43	0	1	0.75	0.44	0	1
Father works missing (2007)	0.14	0.35	0	1	0.20	0.40	0	1	0.20	0.40	0	1	0.22	0.42	0	1
Father completed elementary or junior high school (2000)	0.41	0.49	0	1	0.37	0.48	0	1	0.34	0.47	0	1	0.42	0.49	0	1
Father completed highschool/ college (2000)	0.26	0.44	0	1	0.21	0.41	0	1	0.19	0.39	0	1	0.18	0.39	0	1
Father completed no school / missing (2000)	0.32	0.47	0	1	0.42	0.49	0	1	0.47	0.50	0	1	0.40	0.49	0	1
Child's main carer's education																
Carer completed elementary school	0.24	0.42	0	1	0.21	0.41	0	1	0.21	0.40	0	1	0.28	0.45	0	1
Carer completed highschool/college	0.48	0.50	0	1	0.47	0.50	0	1	0.41	0.49	0	1	0.58	0.49	0	1
Carer completed no school / missing	0.15	0.36	0	1	0.27	0.45	0	1	0.35	0.48	0	1	0.13	0.34	0	1
Household Characteristics																
# children aged 0-6	0.60	0.74	0	5	0.57	0.76	0	5	0.53	0.76	0	5	0.60	0.74	0	4
# children aged 7-14	1.66	0.91	0	6	1.82	0.94	1	6	1.82	0.94	1	6	1.88	0.99	1	5
# children aged 0-14	2.26	1.21	0	9	2.39	1.27	1	9	2.34	1.27	1	9	2.48	1.35	1	7
# working age females (15-54)	2.06	1.33	0	14	2.36	1.44	0	12	2.49	1.52	0	12	2.27	1.35	0	11
# working age male (15-54)	1.92	1.35	0	21	2.24	1.51	0	15	2.33	1.49	0	11	2.23	1.47	0	8
Household assets	15.81	3.00	0	21.11	16.01	2.92	0	21.11	16.23	2.81	0	21.11	16.34	1.81	0	20.96
Average assets per household member	14.04	2.75	0	19.5	14.07	2.66	0	19.5	14.25	2.56	0	19.5	14.37	1.75	0	17.96
Household assets missing	0.03	0.16	0	1	0.02	0.15	0	1	0.02	0.14	0	1	0.00	0.06	0	1
Average income per household member	12.92	2.97	0	17.44	12.78	3.03	0	17.44	12.82	3.00	0	16.86	12.87	2.58	0	15.76
Average income per household member	0.04	0.19	0	1	0.04	0.20	0	1	0.04	0.20	0	1	0.03	0.18	0	1
Standard of Living fell in past 5 years	0.08	0.27	0	1	0.07	0.26	0	1	0.06	0.25	0	1	0.08	0.27	0	1
Standard of Living past 5 years missing	0.30	0.46	0	1	0.42	0.49	0	1	0.49	0.50	0	1	0.20	0.40	0	1
Household has health card (2007)	0.19	0.39	0	1	0.20	0.40	0	1	0.20	0.40	0	1	0.22	0.42	0	1
Health card missing	0.04	0.19	0	1	0.05	0.21	0	1	0.05	0.22	0	1	0.00	0.00	0	0
Assistance to/from parents' siblings																
Norm: Caring child assisted by siblings (2007)	0.64	0.48	0	1	0.69	0.46	0	1	0.74	0.44	0	1	0.83	0.37	0	1
Norm: Caring child assisted by siblings (2007) missing	0.34	0.47	0	1	0.29	0.45	0	1	0.24	0.43	0	1	0.13	0.34	0	1
Norm: Caring child assisted by siblings (1997)	0.74	0.44	0	1	0.76	0.43	0	1	0.77	0.42	0	1	0.84	0.37	0	1
Norm: Caring child assisted by siblings (1997) missing	0.24	0.43	0	1	0.22	0.41	0	1	0.21	0.41	0	1	0.12	0.33	0	1
Parents support siblings	0.16	0.37	0	1	0.11	0.31	0	1	0.09	0.29	0	1	0.11	0.31	0	1
Receive support from other siblings	0.41	0.49	0	1	0.35	0.48	0	1	0.32	0.47	0	1	0.40	0.49	0	1
Support from siblings is missing	0.29	0.45	0	1	0.38	0.49	0	1	0.45	0.50	0	1	0.27	0.45	0	1
# of mother's siblings alive	0.86	1.97	0	12	0.64	1.71	0	11	0.53	1.52	0	10	0.45	1.41	0	8

# of mother's siblings alive missing	0.80	0.40	0	1	0.84	0.37	0	1	0.86	0.35	0	1	0.87	0.33	0	1
# of mother's siblings male	1.32	1.63	0	10	1.00	1.52	0	10	0.77	1.36	0	8	1.00	1.66	0	7
# of mother's siblings female	1.27	1.59	0	10	0.95	1.46	0	9	0.76	1.36	0	9	0.70	1.34	0	9
# of mother's siblings who work	1.61	2.03	0	12	1.26	1.92	0	10	0.99	1.73	0	10	1.18	1.96	0	10
# of mother's siblings single	0.74	1.35	0	10	0.47	1.10	0	10	0.34	0.92	0	8	0.36	0.89	0	6
# of mother's siblings married	1.77	2.22	0	12	1.41	2.13	0	12	1.13	1.96	0	12	1.29	2.09	0	11
# of mother's siblings other marital status	0.05	0.28	0	8	0.04	0.23	0	3	0.04	0.23	0	2	0.01	0.12	0	1
Mother's sibling info missing	0.05	0.22	0	1	0.07	0.26	0	1	0.07	0.26	0	1	0.06	0.24	0	1
# of father's siblings alive	0.94	2.11	0	15	0.68	1.78	0	11	0.57	1.64	0	11	0.69	1.86	0	10
# of father's siblings alive missing	0.79	0.41	0	1	0.84	0.36	0	1	0.87	0.34	0	1	0.85	0.35	0	1
# of father's siblings male	1.24	1.65	0	12	0.90	1.47	0	8	0.76	1.37	0	7	0.98	1.49	0	7
# of father's siblings female	1.18	1.60	0	11	0.83	1.37	0	9	0.71	1.29	0	9	1.02	1.50	0	7
# of father's siblings who work	1.66	2.09	0	12	1.21	1.87	0	12	1.01	1.73	0	10	1.39	1.97	0	9
# of father's siblings single	0.56	1.21	0	9	0.36	0.99	0	8	0.28	0.84	0	8	0.45	1.04	0	5
# of father's siblings married	1.90	2.31	0	14	1.42	2.10	0	12	1.21	2.00	0	12	1.53	2.11	0	10
# of father's siblings other marital status	0.06	0.31	0	6	0.05	0.31	0	6	0.05	0.28	0	4	0.05	0.25	0	2
Father's sibling info missing	0.14	0.34	0	1	0.20	0.40	0	1	0.20	0.40	0	1	0.22	0.41	0	1
Socio-economic information																
Ave_w_prim_ratio	1.22	0.23	0	1.53	1.23	0.22	0	1.53	1.22	0.21	0	1.53	1.25	0.19	0.93	1.53
Ave_w_junhigh_ratio	1.47	0.23	0	1.90	1.48	0.22	0	1.90	1.48	0.22	0	1.90	1.51	0.19	1.21	1.90
Ave_w_highmore_ratio	3.53	0.66	0	4.57	3.54	0.62	0	4.57	3.53	0.61	0	4.57	3.53	0.55	2.61	4.57
Average local wage relative to West Java	-7.54	11.20	-25	10.9	-7.54	11.17	-25	10.9	-7.49	11.15	-25	10.9	-8.05	10.48	-25	10.9
Average local wage missing	0.25	0.43	0	1	0.24	0.43	0	1	0.24	0.43	0	1	0.19	0.39	0	1
Rural	0.50	0.50	0	1	0.50	0.50	0	1	0.49	0.50	0	1	0.52	0.50	0	1
Rural missing	0.01	0.12	0	1	0.01	0.11	0	1	0.01	0.10	0	1	0.00	0.00	0	0
Public transport	0.56	0.50	0	1	0.60	0.49	0	1	0.62	0.49	0	1	0.72	0.45	0	1
Public transport info missing	0.27	0.44	0	1	0.23	0.42	0	1	0.21	0.41	0	1	0.10	0.30	0	1
Number of industries hiring	0.77	1.04	0	3	0.81	1.05	0	3	0.83	1.06	0	3	0.88	1.11	0	3
Number of industries hiring missing	0.40	0.49	0	1	0.36	0.48	0	1	0.34	0.47	0	1	0.29	0.45	0	1
Farm wage (female)	4.79	4.55	0	11.00	5.10	4.53	0	11.00	5.24	4.51	0	11.00	6.27	4.19	0	11.00
Farm wage (female) missing	0.51	0.50	0	1	0.47	0.50	0	1	0.46	0.50	0	1	0.37	0.48	0	1
Farm wage (male)	4.90	4.68	0	11.00	5.22	4.65	0	11.00	5.37	4.64	0	11.00	6.46	4.28	0	11.00
Farm wage (male) missing	0.48	0.50	0	1	0.44	0.50	0	1	0.43	0.49	0	1	0.30	0.46	0	1
Factory wage (female)	1.48	3.35	0	10.13	1.53	3.38	0	10.13	1.61	3.46	0	10.13	1.63	3.46	0	9.74
Factory wage (female) missing	0.84	0.37	0	1	0.83	0.38	0	1	0.82	0.38	0	1	0.82	0.39	0	1

Factory wage (male)	2.03	3.85	0	10.31	2.10	3.89	0	10.31	2.17	3.94	0	10.31	2.28	4.01	0	10.31
Factory wage (male) missing	0.78	0.41	0	1	0.77	0.42	0	1	0.77	0.42	0	1	0.75	0.43	0	1
Natural Disaster in Household's area																
Disaster in the past 5 years	0.25	0.43	0	1	0.26	0.44	0	1	0.26	0.44	0	1	0.29	0.46	0	1
Disaster in the past 5 years missing	0.04	0.19	0	1	0.05	0.21	0	1	0.05	0.22	0	1	0.00	0.00	0	0
Frequency of the disaster	0.15	1.15	0	50	0.14	1.15	0	50	0.13	0.82	0	20	0.14	1.22	0	20
Frequency of the disaster missing	0.93	0.25	0	1	0.93	0.25	0	1	0.93	0.25	0	1	0.94	0.25	0	1
Years since disaster	0.06	0.33	0	7	0.06	0.32	0	5	0.05	0.29	0	5	0.05	0.27	0	2
Years since disaster missing	0.93	0.25	0	1	0.93	0.25	0	1	0.93	0.25	0	1	0.94	0.25	0	1
Repairs due to disaster	0.09	0.28	0	1	0.09	0.28	0	1	0.08	0.27	0	1	0.07	0.26	0	1
Repairs due to disaster missing	0.04	0.19	0	1	0.05	0.21	0	1	0.05	0.22	0	1	0.00	0.00	0	0
Province Information																
North Sumatra	0.08	0.27	0	1	0.07	0.26	0	1	0.06	0.23	0	1	0.04	0.20	0	1
West Sumatra	0.05	0.22	0	1	0.06	0.24	0	1	0.06	0.25	0	1	0.10	0.30	0	1
South Sumatra	0.05	0.22	0	1	0.05	0.22	0	1	0.05	0.22	0	1	0.02	0.16	0	1
Lampung	0.04	0.20	0	1	0.04	0.20	0	1	0.04	0.21	0	1	0.04	0.20	0	1
Jakarta	0.07	0.25	0	1	0.07	0.26	0	1	0.07	0.25	0	1	0.02	0.16	0	1
East java	0.04	0.19	0	1	0.04	0.20	0	1	0.05	0.21	0	1	0.03	0.18	0	1
West Java	0.20	0.40	0	1	0.19	0.39	0	1	0.18	0.38	0	1	0.15	0.36	0	1
Central Java	0.12	0.33	0	1	0.13	0.34	0	1	0.14	0.35	0	1	0.20	0.40	0	1
Yogyakarta	0.12	0.33	0	1	0.12	0.33	0	1	0.13	0.34	0	1	0.12	0.33	0	1
Bali	0.04	0.20	0	1	0.05	0.21	0	1	0.06	0.23	0	1	0.04	0.19	0	1
Nusa Tenggara Barat	0.07	0.25	0	1	0.05	0.23	0	1	0.05	0.21	0	1	0.06	0.25	0	1
North Sumatra	0.05	0.22	0	1	0.04	0.20	0	1	0.04	0.19	0	1	0.06	0.24	0	1
South Sulawest	0.06	0.24	0	1	0.07	0.25	0	1	0.07	0.25	0	1	0.09	0.29	0	1
Robustness variables																
At least one elder aged 70+	0.04	0.19	0	1	0.07	0.26	0	1	0.11	0.31	0	1	0.24	0.43	0	1
*Caring child inherits * At least one elder aged 70+*	0.72	0.45	0	1	0.46	0.50	0	1	0.22	0.41	0	1	0.12	0.32	0	1
Mother is Minang	0.04	0.20	0	1	0.04	0.21	0	1	0.04	0.20	0	1	0.07	0.25	0	1
Mother Minang missing	0.17	0.38	0	1	0.27	0.44	0	1	0.34	0.47	0	1	0.15	0.36	0	1
Father is Minang	0.04	0.19	0	1	0.04	0.19	0	1	0.03	0.18	0	1	0.06	0.25	0	1
Father Minang missing	0.24	0.43	0	1	0.36	0.48	0	1	0.41	0.49	0	1	0.33	0.47	0	1

* The outliers in *Hours work/wk by child's carer* had little impact on results during robustness tests. Results available upon request.

The *Cores and Non-cores Sample* includes all households with children aged 7-15 in 2007. The *Full Sample* contains all children who coresided with at least one elderly person in 2007, while the

Panel Sample further restricts this to elderly coresidence for each year between 2000 and 2007. The *Two-way carer'* sample contains those children whose main carer is also identified as the main carer for elders in the household. The latter three samples only include children aged 7-*14* as carer information is not provided for 15 year old children.

APPENDIX B: NOT FOR PUBLICATION
DISASTER IN HOUSEHOLD'S AREA

Questions and Sampling

IFLS4 introduces a comprehensive module about natural disasters including civil strife that occurred in the households' area (Book2, module ND). There are many missing variables for the detailed questions about injuries and loss of assets, thus we focus upon higher-level reports of disasters occurring. The mere occurrence of such shocks is likely to affect employment demand and consequently wages, and also to impact other factors affecting children's ability to attend school. We thus use these *Disaster Variables* as instruments in all IV3SLS models.

The variables extend to disaster occurring in the past 5 years before 2007, which covers the major part of our 2000 to 2007 period of interest. Module KR in that book asks repairs to the house as a result of disaster since 2000, which extends to our entire period. The different types of disasters in module ND are aggregated to create instruments representing exogenous shocks to employment demand and infrastructure (*Disaster in the past 5 years, Frequency of disaster, Years since disaster*), while question KR24b is used to generate *Repairs due to disaster.*

Now we would like to ask about natural and disaster that your household may have experienced in the last 5 years.

ND01.	In the last 5 years, was there any natural or other disaster (including civil strife) in the area where you live? If yes, what type of disasters?	
ND02.	Did any of the disaster was severe enough to cause death or major injuries of a household member, cause direct financial loss to the household, or cause household member to relocate?	
Answer to ND01	**W→SECTION BH** A B C D E F G H I J	**ND04.** How many times has this household experienced [...] in the last 5 years? ⌊⌊⌋⌋ times
Answer to ND02	No ..... 3 **→SECTION BH** Yes 1	**ND05.** When was the most severe [...] in the last 5 years occurred? ⌊⌊⌋/⌊⌊⌋⌊⌊⌋⌊⌊⌋ Month Year

KR24b.	Since 2000, has this household renovated/had major repair done on the house ? **1. Yes, because of disaster** **2. Yes, renovated** **3. No**	1. Built a new house. ..... 1 2 3 2. Built a new room ..... 1 2 3 3. Installed a new roof . ..... 1 2 3 4. Installed/replaced the floortiles/terrazzo . ..... 1 2 3 5. Painted the whole house . ..... 1 2 3 6. Built a new kitchen or expanded the kitchen..... 1 2 3 7. Replaced/installed plumbing system ..... 1 2 3 8. Installed sewerage/sanitation system. ..... 1 2 3 9. Increased electricity voltage 1 2 3

Sample Proportions

Approximately one-quarter of the 13000 households in IFLS4 experienced a *Disaster in the past 5 years*. Our sample proportions as reported in Table 2 are consistent with this figure. While the

sample of *Two-way carers* (281 observations) sees a slight increase in children experiencing a *Disaster in the past 5 years,* the standard deviation of 0.43 suggests it is not conclusively higher line (the full set of ancillary statistics is available on request). As our samples have multiple children per household, Table A1 illustrates that the distribution of our sample households across disaster-affected areas is nonetheless consistent with the original IFLS data.

Statistics for the *Frequency of the disaster* and *Years since the disaster* are also reported in Table A1. This is because the Table 2 summary statistics are not conditional on *Disaster in the past 5 years* and *Severe Disaster in the past 5 years*, whereas the survey questionnaire conditions them this way. (*Severe Disaster…* was not included in our regression as it was a subset of *Disaster in the past 5 years*). The conditional statistics also indicate that our sample does not over-represent households in particular areas.

Table B1: Summary statistics for disaster variables

	IFLS	***Cores and Non-Cores Sample***	***Full Sample***	***Panel Sample***	***Two-way carer Sample***
# of households	12987	6223	2780	1595	186
Disaster in the past 5 years (ND01)	24.00 (3119/ 2987)	23.61 (1469/6223)	24.78 (689/2780)	24.26 (387/1595)	27.88 (50/186
Severe Disaster in the past 5 years (ND02)	26.10 (814/ 3119)	27.43 (403/1469)	25.34 (175/689)	25.84 (100/387)	24.00 (12/50)
Frequency of Disaster (ND04)	1.94 (814 obs)	2.15 (403 obs)	2.06 (175 obs)	1.83 (100 obs)	2.67 (50 obs)
Years Since Disaster (ND05)	0.90 (814 obs)	0.85 (403 obs)	0.89 (175 obs)	0.86 (100 obs)	0.75 (50 obs)

Appendix C: NOT FOR PUBLICATION

COMMUNITY NORMS

Questions and Sampling

Community norms are obtained from the *adat* (traditional law) module of the Community-Facility Survey undertaken in IFLS2 (1997) and IFLS4 (2007). IFLS2 obtained information from local *adat* experts in communities without highly diverse ethnic populations (**Frankenberg, E. and D. Thomas. "The Indonesia Family Life Survey (IFLS): Study Design and Results from Waves 1 and 2. DRU-2238/1-NIA/NICHD draft p12,16**). IFLS4 asked village/municipal leaders to list six potential respondents, from which up to 2 were randomly chosen (see IFLS 2007 Userguide Vol 1 6-23-09 Draft p16). This resulted in a few duplicate observations, of which we retained the first record as primary and supplementary records tended to have similar responses.

There was also an increase in the number of communities (Ennumerated Areas) that responded to the adat module from 304 in 1997 to 322 in 2007. This arose because IFLS4 included new communities to which past respondents had moved (see IFLS 2007 Userguide ... draft p12)

For each norm, IFLS2 distinguished between 'traditional law' and 'common practice.' However, responses were almost identical across these categories and IFLS3 simply asked 'traditional law,' thus, we used the 'traditional' response to generate binary variables that indicate the existence of the norm.

Sample Proportions

In the original IFLS sample, our variables of interest changed very little over the ten year period with the exception of 'caring child house' which indicated a decrease in community expectations that children who care for elderly parents inherit the parents' house. (See IFLS Userguide 2007 p66 for sample response rates).

Such stability is also reflected in our various samples, which are mostly consistent with the original data distributions. [Include information about our samples?] The main difference is the higher proportion of positive 'caring child inherit' and 'caring child house' responses in the sample with one main carer (281 observations). This raises an endogeneity issue as households which already have coresiding elderly in 2007 may be more likely to live in communities with

stronger inheritance expectations. That 'caring child inherit' increases between 1997 and 2007 further suggests an increased expectation of inheritance amongst these households.

Questions for 2007 Variables

SECTION BL: LIIVING ARRANGEMENT OF ELDERLY

Now we will ask you about aspects of living arrangements for the elderly:

		According to traditional law
BL01.	Do parents remain in their own homes in their old age?	No ..... 3➔**BL04** Yes 1
BL02.	With whom do parents usually live?	Nobody (alone) ..... 00 Youngest daughter ..... 01 Oldest daughter ..... 02 Youngest son ..... 03 Oldest son ..... 04 Relatives ..... 05 Other family ..... 06 Youngest child ..... 09 Daughter ..... 10 Son ..... 11 Grandchild ..... 12 Up to parents ..... 13 Favorite child ..... 14 Rotate among children ..... 15 Unmarried child ..... 16 Child, not specified ..... 17 Other ..... 95 ➔ **BL06**
BL04.	Where do parents usually live in their old age?	With their relatives ..... 2➔**BL06** With other family ..... 3➔**BL06** Senior citizen's home or another similar facility ..... 4➔**BL06** With their children 1

		According to traditional law
BL06.	Do the children of this village take care of their parents in the old age?	No ..... 3➔**BL09** Yes 1
BL07.	If children are responsible co-reside with their parents, do other adult children provide assistance?	No ..... 3➔**BL09** Yes 1
BL08.	What type of assistance is provided by other children?	Money ..... A Clothes ..... B Food ..... C Labor/attention ..... D Healthcare costs ..... E Other V

SECTION BW: DEATH AND INHERITANCE

Now we will ask you about aspects of death and inheritance

		According to Traditional Law and Custom
BW10a.	If one child lives with their parents and takes care of them until their death, does this child receive a larger proportion of the inheritance compared to the other children?	Yes ..... 1 No 3
BW12.	Will this child that lives with and takes care of the parents receive the parent's house that they are occupying as part of the inheritance?	Yes ..... 1 No 3

Questions for 1997 Variables

SECTION BL: LIVING ARRANGEMENTS FOR THE ELDERLY

Now we will ask you about aspects of living arrangements for the elderly:

ADATTYPE	A. According to traditional law
BL01. Do parents after they are old remain in their own homes?	No ..... 3 → **BL03** Yes 1
BL02. With whom do parents usually live?	Nobody (alone) ..... 00 Youngest female child ..... 01 Oldest female child ..... 02 Youngest male child ..... 03 Oldest male child ..... 04 Relatives ..... 05 Other family ..... 06 Other, mention_____ 07 Youngest child ..... 09 Female child ..... 10 Male child ..... 11 Grandchild ..... 12 Up to parents ..... 13 Favorite child ..... 14 Rotate among children ..... 15 Unmarried child ..... 16 Child, not specified ..... 17 → **BL06**
BL04. In what places do parents live?	With their children ..... 1 → **BL05** With their relatives ..... 2 → **BL06** With other family ..... 3 → **BL06** Senior citizen's home or another similar facility ... 4 → **BL06**
BL05. Do parents prefer to live with male or female children?	Male children ..... 1 Female children ..... 3 The same 5
BL06. Do the children of this village feel an obligation to take care of their parents?	No ..... 3 → **BL09** Yes 1
BL07. If children are responsible or live in the same house with their parents, do other adult children provide assistance?	No ..... 3 → **BL09** Yes 1

SECTION BW: DEATH AND INHERITANCE

Now we will ask you about aspects of death and inheritance

ADATTYPE	A. According to traditional law
BW12. If one child lives with their parents and takes care of them until their death, does this child receive a larger proportion of the inheritance compared to the other children?	Yes ..... 1 No 3
BW13. Will this child that lives with and takes care of the parents receive the parent's house that they are occupying as part of the inheritance?	Yes ..... 1 No ..... 3 → **BW01B**

Table C1: Proportion of positive responses to community norms, excluding missing ('mis') observations

	IFLS Communities		***Competition for Care Data***							
	IFLS 1997 (N = 304)	**IFLS 2007 (N = 322)***	**9170**		**4164**		**2370**		**281**	
			1997	**2007**	**1997**	**2007**	**1997**	**2007**	**1997**	**2007**
Coresidence related norms										
Comm_elderly_arrangements (IFLS2: bl01, bl02; IFLS4: bl01, bl02, bl04, bl06)	67 (181, 34 mis)	63 (198, 9 mis)	68 (4832, 2053 mis)	66 (4121, 2951 mis)	69 (2289, 866 mis)	66 (2016, 1103 mis)	68 (1299, 465 mis)	67 (1236, 514 mis)	74 (182, 34 mis)	64 (159, 33 mis)
Comm_children (bl06)	99 (268, 34 mis)	98 (306, 9 mis)	99 (7070, 2053 mis)	97 (6050, 2951 mis)	99 (3282, 866 mis)	97 (2973, 1103 mis)	99 (1896, 465 mis)	97 (1806, 514 mis)	100 (247, 34 mis)	98 (244, 33 mis)
Inheritance related norms										
caring_child_inherit (IFLS2: bw12; IFLS4: bw10a)	34 (90, 35 mis)	31 (96, 9 mis)	33 (2327, 2116 mis)	34 (2120, 2951 mis)	34 (1121, 893 mis)	34 (1046, 1103 mis)	36 (682, 479 mis)	36 (660, 514 mis)	38 (94, 34 mis)	**44 (108, 33 mis)**
caring_child_house (IFLS2: bw13; IFLS4: bw12)	46 (124, 35 mis)	**33 (102, 9 mis)**	47 (3321, 2116 mis)	36 (2232, 2951 mis)	48 (1561, 893 mis)	36 (1087, 1103 mis)	49 (920, 479 mis)	36 (661, 514 mis)	**56 (138, 34 mis)**	**44 (109, 33 mis)**
comm_norm_assistance (bl07)	97 (259, 38 mis)	96 (294, 16 mis)	98 (6817, 2194 mis)	97 (5885, 3120 mis)	97 (3160, 919 mis)	97 (2887, 1191 mis)	97 (1818, 494 mis)	97 (1750, 564 mis)	96 (236, 34 mis)	96 (234, 37 mis)

* The 2007 survey included a greater number of communities than the 1997 survey.

Appendix D: NOT FOR PUBLICATION

Investigating whether coresidence affects inheritance norms

Summary statistics

In order to investigate whether communities with higher coresidence norms are more likely to enforce inheritance norms, we first obtain proportions of inheritance conditional on coresidence. Table A3 indicates that if a community held norms about coresidence, this does not automatically mean that they expect inheritance. The higher proportion of positive inheritance norms in the "two-ways main carer" sample is not out of line with the general sample proportions reported in Table A2.

As the community norms are consistent across the years, we also consider whether with coresiding elderly may be more likely to live in communities with positive inheritance norms. However, our data in Table A4 indicates that around one-quarter of coresiding households existed in communities which reported inheritance norms in 2007 – less than the general sample proportion. This is true even when we consider coresidence in 2000.

Table D1: Proportion of positive responses to 'caring_child_inherit' when both coresidence related norms (comm_elderly_arrangements and comm_children) are answered positively.

	IFLS Communities		***Competition for Care Data***							
	IFLS 1997 (N = 304)	**IFLS 2007 (N = 322)***	**9170**		**4164**		**2370**		**281**	
			1997	**2007**	**1997**	**2007**	**1997**	**2007**	**1997**	**2007**
Caring_child_inherit	33.33 (90/270)	30.87 (96/311)	32.70 (2327/7117)	34.31 (2121/6182)	33.99 (1121/3298)	34.40 (1046/3041)	35.80 (682/1905)	35.77 (660/1845)	39.46 (88/223)	46.29 (106/229)
Caring_child_house	45.93 (124/270)	31.56 (101/311)	46.66 (3321/7117)	35.73 (2209/6182)	47.33 (1561/3298)	35.45 (1078/3041)	48.29 (920/1905)	35.56 (656/1845)	55.16 (123/223)	42.36 (97/229)

Table A4: Proportion of inheritance norms in households with coresiding elders

	Coresidence in 2007	**Coresidence in 2000**
Caring_child_inherit 2007	25.15 (1046/4164)	25.71 (565/2198)
Caring_child_house 2007	26.08 (1086/4164)	25.66 (564/2198)

As our observations represent children and there are often multiple children in a household, these results were verified using just household-level observations. The proportions remained consistent. Results available upon request.

Formal Investigation

Instrumental Variable Probit models are used to instrument for the potentially endogenous effect of "caring_child_inherit" (models instrumenting for both *Caring child inherits* and *Caring child receives house* did not converge). We instrument using *Mother's and father's sibling information in 2000* is used as instruments. Table A5 shows that the coefficients of the social norms governing inheritance change considerably. Given that the 3SLS models apply all instruments against all endogenous variables, we prefer robustness tests which compare *Caring child inherits* as exogenous and endogenous in that specification.

Table D2: Probit models of the probability of elderly coresidence in 2007

	Probit Models				**Instrument Variables Probit Models**			
	Specification I		**Specification II**		**Specification I**		**Specification II**	
	Coefficient	*Standard Err.*	*Coefficient*	*Standard Err.*	*Coefficient*	*Standard Err.*	*Coefficient*	*Standard Err.*
'Inheritance' norms								
Caring child inherits	0.02	(0.04)	0.02	(0.04)	2.89***	(0.03)	2.90***	(0.02)
Caring child receives house	0.00	(0.04)	-0.02	(0.04)	-1.17***	(0.03)	-1.17***	(0.03)
'Coresidence' Norms								
Elderly live with their children	-	-	0.00	(0.03)	-	-	0.13***	(0.03)
Children care for elderly parents	-	-	0.49***	(0.11)	-	-	-0.16*	(0.08)
Sibling assistance								
Caring children assisted by siblings	0.25***	(0.000)	-0.21*	(0.11)	0.57***	(0.03)	-0.51***	(0.08)
Adults in hh give financial support to other siblings	-0.30***	(0.000)	-0.30***	(0.04)	-0.05***	(0.03)	-0.05*	(0.03)
Adults in hh receive financial support from other siblings	0.03	(0.03)	0.04	(0.03)	0.03	(0.03)	0.03	(0.03)
N	9170		9170		9170		9170	
LR Chi Squared test	1708.99***		1729.47***		-		-	
Pseudo R2	0.13		0.14		-		-	
Wald Chi Squared test	-		-		17837.00***		18035.32***	
Rho	-		-		-0.99***		-0.99***	
Wald test of exogeneity (athrho)	-		-		42.49***		30.58***	
Hausman specification test	-		-		5078.47***		5312.52***	

Specification I exclude the 'co-residence' norms from the right hand side. Specification II includes them.