

Cameron, Lisa; Cobb-Clark, Deborah A.

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## Old-Age Support in Developing Countries: Labor Supply, Intergenerational Transfers and Living Arrangements

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April 2001

# Old-Age Support in Developing Countries: Labor Supply, Intergenerational Transfers and Living Arrangements

**Lisa Cameron**

*Department of Economics, University of Melbourne*

**Deborah A. Cobb-Clark**

*SPEAR Centre, RSSS, Australian National University, Canberra  
and IZA, Bonn*

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IZA

P.O. Box 7240  
D-53072 Bonn  
Germany

Tel.: +49-228-3894-0  
Fax: +49-228-3894-210  
Email: [iza@iza.org](mailto:iza@iza.org)

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## ABSTRACT

### **Old-Age Support in Developing Countries: Labor Supply, Intergenerational Transfers and Living Arrangements\***

Without broad-based public pension schemes, the majority of the elderly in developing countries are left to rely on their own current and accumulated earnings and support from children as means of old-age support. We develop a cooperative bargaining model that allows us to jointly estimate the determinants of coresidency, financial transfers from non-coresiding children, and the labor-supply of elderly Indonesians. We find that many Indonesians, especially men, continue to work well into old age even if they are living with their adult children. There is little evidence that transfers are a substitute for the income support provided by the elderly parent's own labor supply. Transfers are associated with a decline in hours of work only for non-coresiding mothers. Furthermore, transfers are not strongly related to parental need or the ability of the child to give.

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Lisa Cameron  
Department of Economics  
University of Melbourne  
Victoria 3010  
Australia  
Tel.: +61 3 8344-5329  
Fax: +61 3 9344-6899.  
Email: [lcameron@unimelb.edu.au](mailto:lcameron@unimelb.edu.au).

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## **Old-Age Support in Developing Countries: Labor Supply, Intergenerational Transfers and Living Arrangements.**

### **1. Introduction**

Like the populations of industrialised nations, the populations of many developing countries are aging rapidly.<sup>1</sup> The experience of industrialised nations is unlikely to be of much benefit to these developing countries, however, because the policy context differs so dramatically. Pension plans, for example, are virtually non-existent. When they do exist, they are generally only available to the elite. Without pension schemes, the majority of the elderly in developing countries must depend on some combination of coresidency with children, the receipt of financial transfers from children, their own labor market income and their own, often meagre, asset stocks as their main forms of old-age support. The reliance on support from children is likely to become strained as elderly dependency ratios increase.<sup>2</sup>

Little is known about the link between transfer behavior and coresidency patterns in developing countries and even less has been written about elderly individuals' labor supply. Here we develop a theoretical model in which labor supply is determined simultaneously with coresidency and the receipt of transfers. In particular we are interested in examining the quantitative importance of each of these three forms of support and establishing whether transfers and coresidency are targeted in terms of being responsive to the needs of the parents and the ability of the

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<sup>1</sup> In Indonesia for instance (which has the third largest population over the age of 65 in the world) the number of Indonesian elderly is projected to increase by 400 percent between 1990 and 2025 (Adlakha and Rudolph, 1994).

<sup>2</sup> Indonesia's dependency ratio has been predicted to double from 5 persons aged over 65 per 100 persons aged 15-64, to 10 in 2010, Adlakha and Rudolph (1994).

children to give. Finally, we wish to obtain an understanding of the relationship between these financial transactions—that is the extent to which they are complements or substitutes. This will provide some insight into how the changes in one form of support over time are likely to impact on the other forms of support and what the welfare consequences are likely to be.

We begin by building upon a theoretical model originally developed by Pezzin and Schone (1996) to examine old-age support in the United States. The theoretical framework allows for the simultaneous determination of different forms of old-age support for the elderly. Specifically, coresidency, the receipt of transfers and the parent's labor supply are determined as the outcome of bargaining between children and parents.<sup>3</sup> The model suggests a simultaneous system of equations which we then estimate using data from the Indonesian Family Life Survey (IFLS). The IFLS is a particularly rich source of information on Indonesia's elderly population.

Our results indicate that transfers from non-coresiding Indonesian children to their elderly parents are not strongly related to parental need (as measured by parental and coresiding siblings' characteristics) or the ability to give (as measured by non-coresiding children's characteristics). In general, elderly labor supply is also not sensitive to other income support in the form of coresidency or transfers. The exception is non-coresiding women who decrease their labor supply as their children's transfers increase.

The outline of the paper is as follows. In Section 2 we review the existing literature on support for the elderly in developing countries. In Section 3 we set up the theoretical bargaining model, while in Section 4 the estimation strategy is

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<sup>3</sup> In Pezzin and Schone's (1996) model the variables of interest are the living arrangement of the parent, the amount of time the daughter dedicates to providing care for the parent, and the daughter's

discussed. We describe the IFLS data in more depth in Section 5 . Section 6 presents the results estimated using the system of equations suggested by the theory. Finally, Section 7 presents our conclusions and suggests some directions for future research.

## **2. Previous Literature**

Despite a growing interest in the welfare of the elderly in developing countries - and an established literature on retirement in developed countries - remarkably little has been written on the labor supply of the elderly in the developing world. The only study of elderly labor supply in a developing country of which we are aware is Cain (1991) which provides a descriptive account of the daily activities of a small sample of elderly individuals in rural Bangladesh. Adlakha and Rudolph (1994) provide some descriptive statistics of average hours worked by Indonesian elderly which show that two-thirds of older men and one-third of older women remain economically active.<sup>4</sup>

More has been written on the other forms of support examined here – coresidency and transfers. There is a small existing literature that examines the factors related to an elderly parent’s decision to coreside with one of his/her children. DaVanzo and Chan (1994) examined coresidency in Malaysia, Cameron (2000) and Beard, Frankenburg and Saputra (1999) analyzed data from Indonesia, and Martin (1989) conducted a cross-country comparison of coresidency behavior in Fiji, Korea, Malaysia and the Philippines. While DaVanzo and Chan (1994) find that coresidency responds to economic variables such as the parent’s income and housing prices, Cameron (2000) and Martin (1989) find only very small effects of economic

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labor supply. In a related paper they also model cash transfers, but do not implement it empirically because of the lack of importance of cash transfers in the U.S. data (Pezzin and Schone, 1998).

variables on coresidency. Frankenburg, Beard and Saputra (1999), using panel data, also found that economic factors did not play a significant role in the transition to coresidency in Indonesia.<sup>5</sup>

The literature on intergenerational transfer behavior in developing countries is much more developed. Research on transfers for both developed and developing countries has, to a large extent, focused on differentiating between various theories of transfer behavior and examining whether public pensions crowd out private transfers.<sup>6</sup> In addition to old-age income support, the main motives that have been invoked to explain transfer behavior are: altruism amongst family members (Becker 1974, 1991 and 1993); payments for services (such as child care) provided by family members (Bernheim, Shleifer and Summers, 1985); insurance mechanism to promote consumption smoothing across family members; and repayment to parents for their earlier investment in the child, for example educational expenditure.<sup>7</sup>

The attempts to empirically differentiate between these theories have met with limited success. Lillard and Willis (1997) find strong evidence of the parental repayment hypothesis in Malaysian data, but weak evidence of all of the other motives. Secondi (1997) and Hoddinott (1992) find evidence that transfers are consistent with the exchange motive in China and Kenya respectively. Other studies of Kenya (Knowles and Anker, 1981) and Botswana (Lucas and Stark, 1985) have

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<sup>4</sup> Niehof (1995), although not dealing directly with labor supply, presents an interesting overview of the experiences of elderly Indonesians.

<sup>5</sup> See Hoerger, Picone and Sloan (1996) for a paper that examines elderly living arrangements in the United States.

<sup>6</sup> See Cox and Jimenez (1992) and Jensen (1996) for example. Khemani (1999) takes a different approach and examines whether intergenerational transfers in Indonesia are explained by bargaining between husbands and wives over how much to transfer to their respective parents.

<sup>7</sup> Lillard and Willis (1997) provide more extensive descriptions of each of these motives.



been inconclusive.<sup>8</sup> Finally, Ravallion and Dearden (1988) find that transfers on the Indonesian island of Java are generally targeted towards the disadvantaged, i.e., the sick, elderly, or unemployed, although there are large and important differences between transfers in rural and urban areas.

This study, although shedding some light on this debate, does not aim to differentiate between possible motives for intergenerational transfers. Instead the aim is to contribute to our understanding of the entire package of support that is available to the elderly in developing countries by simultaneously modelling coresidency, transfers and labor supply.<sup>9</sup> Unlike the previous research on transfers, we focus specifically on transfers to the elderly. Furthermore, previous researchers have generally ignored the labor-supply and coresidency decisions of the elderly parent or treated these decisions as exogenous to the transfers decision.<sup>10</sup> A more realistic scenario is one in which the package of old-age support is decided simultaneously with transfers for instance being a function of the labor market earnings and living arrangements of the recipient. These two decisions will, in turn, be affected by the level of transfers.

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<sup>8</sup> Results from developed countries have been just as indecisive. For example, Cox (1987) and Cox and Rank (1992) reject altruism on the basis that transfers in the United States are positively correlated with recipient's incomes, while McGarry and Schoeni (1995) and Altonji, Hayashi and Kotlikoff (1995) find the opposite correlation and conclude in favour of altruism. There have also been attempts to examine transfers within households, see Kochar (1997) and Pezzin and Schone (1997).

<sup>9</sup> None of the aforementioned studies specifically focused on transfers to the elderly. In fact, the focus of the U.S. literature has been on transfers from parents to children. In developing countries, the majority of transfers flow in the opposite direction, that is, from children to parents.

<sup>10</sup> Rosenzweig and Wolpin (1993) jointly model living arrangements, transfers from parents to children and children's human capital investments in the United States. Lillard and Willis (1997) initially allow coresidency to be endogenous in their transfers equations but conclude that it is exogenous.

### 3. The Theoretical Model: The Single Child Case

This paper attempts to formalize the examination of elderly labor supply in developing countries. Following Pezzin and Schone (1996) we use a cooperative bargaining framework to simultaneously model the labor supply of the elderly as well as the living arrangements of and transfers between adult children and their elderly parents. There are three main theoretical steps. First, we characterize the labor supply and transfer behavior that would prevail if the child and parent lived separately. Second, we examine the outcome of Nash bargaining if a joint household were to be formed using the “living separately” solution to define the child and parent’s respective threat points in this state. Third, coresidency is determined by a comparison of the utility obtained by each individual in the two possible states. Coresidency occurs if both parties receive higher utility when living together than when living alone. We first go through the case where the parent has only a single child. In developing our estimation framework, we then expand the model to allow for the possibility of multiple children.

#### *Living Separately:*

We characterize the utility functions of the child,  $U^C$ , and the parent,  $U^P$ , as:

$$U^C(X^C, L^C, W(L^P; D); \theta^C) \quad (1)$$

$$U^P(X^P, L^P, W(L^P; D); \theta^P) \quad (2)$$

where  $X^i$  with  $i = C, P$  is the vector of private goods consumed by the child and the parent respectively,  $L^i$  is the amount of leisure each consumes and  $W$  is a public good consumed by both the parent and the child. An important element of the model is

that the child is assumed to “care” for their parents in the sense that a measure of the parent’s welfare appears in the utility function of the child.  $W$  can be conceptualized as the elderly individual’s health status or a broader indicator of the parent’s well-being that the child cares about. Thus, the inclusion of the parent’s well-being in the child’s utility function introduces an element of altruism to the model.<sup>11</sup> The parent’s “well-being” is modelled here as being a function of the elderly individual’s labor supply and any long-term disability experienced by the individual. Finally,  $\theta^i$  is a vector of the parent’s and child’s taste parameters.

Both individuals maximize their utility relative to their respective budget constraints which are give by

$$w^C T + V^C = X^C + w^C L^C + TR \quad (3)$$

$$w^P T + V^P + TR = X^P + w^P L^P \quad (4)$$

where  $T$  is the full endowment of time,  $w^i$  is the labor market wage (including in self-employment), and  $TR$  is transfer payments from the child to the parent. While  $V^P$  are any other forms of non-earned income the parent receives,  $V^C$  is the child’s unearned income. Finally, the price of the private good is normalized to one.

Thus, the elderly individual is assumed to choose his/her labor supply to maximize (2) subject to (4). Note that for simplicity we do not allow for the possibility of saving in the theoretical model and so choosing  $L^P$  completely determines  $X^P$ . The level of transfers received,  $TR$ , is determined by the child who chooses  $X^C$  and  $L^C$  to maximize his/her utility subject to (3).

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<sup>11</sup> Note that a truly altruistic model would include the parent’s utility function as an element of the child’s utility function. This model however collapses to one of income sharing. That is, the distribution of income between parent and child should not affect the outcome of the utility maximisation. The income-pooling hypothesis has however been widely rejected in the literature and on this basis we opt for the model above. This is an intermediate position between full altruism and individualistic pay-off maximization. In our model, the child cares about only particular components of the elderly individual’s welfare.

The appearance of the elderly parent's well-being,  $W$ , in both utility functions generates an interdependency between the decisions of the child and the parent. The parent's labor supply decision is a function of the transfers received from the child while the child's transfer decision (which is completely determined by the choice of  $X^C$  and  $L^C$ ) is in turn a function of the parent's well-being and hence the parent's labor supply decision. We resolve this circularity by assuming a Cournot-Nash equilibrium solution. Thus, the parent and child make their decisions simultaneously, taking the decisions of the other as given.

The parent decides how many hours to work, taking the child's transfer decision as given. Hence:

$$L^P = f(V^P, w^P, \overline{TR}; D, \theta^P) \quad (5)$$

The child similarly chooses a consumption level and labor supply which determine transfers. Hence:

$$TR = f(V^C, w^C, \overline{L}^P; \theta^C) \quad (6)$$

The outcome is determined by the intersection of these reaction functions. At this point the beliefs of the child and the parent are satisfied so that  $\overline{L}^P = L^{P*}$  and  $\overline{TR} = TR^*$ . The outcome can thus be characterized as:

$$\Psi^C = \Psi^C(V^C, w^C, L^{P*}) \quad (7)$$

$$\Psi^P = \Psi^P(V^P, w^P, TR^*). \quad (8)$$

### ***Living Together:***

In the case where the child and parent live together then, we assume that household bargaining proceeds according to a Nash bargaining rule. The equilibrium

values of  $L^P$  and  $TR$  will thus maximize the product of the gains from household formation, defined relative to the utilities at the respective threat points:

$$N = [U^C - \Psi^C] \cdot [U^P - \Psi^P]$$

subject to the joint budget constraint:

$$V^C + V^P + (w^C + w^P)T = (X^C + X^P) + w^C L^C + w^P L^P. \quad (9)$$

Note that  $\Psi^C$  and  $\Psi^P$ , given by equations (7) and (8), reflect the utility that each party would receive if they lived separately.

Hence, when the parent and the child coreside, all household decisions are a function of the characteristics of both the parent and the child. That is:

$$L^P = L^P(\theta^C, \theta^P, w^P, w^C, V^P, V^C, D) \quad (10)$$

$$TR = TR(\theta^C, \theta^P, w^P, w^C, V^P, V^C, D) \quad (11)$$

***The Coresidency Decision:***

Whether the parent coresides or not is ultimately a function of the utility obtained in each of the two possible states and so is a function of all of the variables in the system: More specifically, coresidency (C) is given by the following:

$$C = C(\theta^P, \theta^C, w^P, w^C, V^P, V^C, D) \quad (12)$$

**4. Empirical Model and Estimation Strategy for the Case of Multiple Children:**

Equations (5), (6), (10), (11) and (12) provide the basis of an estimating strategy. This framework however ignores the possibility that elderly individuals may have more than one child. Most previous studies have examined parent/child pairs and ignored the existence of other children. Unlike many data sets, however, the IFLS provides information on all the living children of the elderly individuals and

on how much the non-coresiding children transfer to their parents. Hence, we can examine how parental labor supply responds to total transfers from non-coresiding children, not just those from an individual child. Once one acknowledges the existence of more than one child the possibility arises that children's transfer behavior may be conditioned on the transfer behavior of their siblings. We do not explicitly model such interactions but the estimating equations allow for the possibility of such behavior.<sup>12</sup>

***Living Separately:***

If a parent does not coreside with any of his/her adult children then, as suggested by equation (5), the parent's labor supply is a function of parental characteristics and the level of transfers received. Here however, transfers received will be the total transfers received from all children. Assuming a linear functional form for the transfer equation yields:

$$LS^P = \beta_{0n} + \beta_{1n}Z^P + \gamma_{1n}\Sigma TR^* + \varepsilon_1 \quad (13)$$

where  $Z^P = \{V^P, w^P, \theta^P, D\}$  is a vector of parental characteristics and  $\Sigma TR^*$  is the sum of transfers from all non-coresiding children. The asterisk indicates that the transfer term is endogenous and this is dealt with in the estimation.

Equation (6) suggests that transfers are a function of the characteristics of the children (who are in this case, by definition, all non-coresiding) and the parent's labor supply. When there are multiple children, in addition to taking the parent's

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<sup>12</sup> See Hiedemann, B. and S. Stern (1998) and Engers and Stern (1998) for studies that explicitly model interactions between children. Analyzing transfers in Malaysia, Lillard and Willis (1997) conclude that their results provide little empirical evidence that the behavior of siblings affects individuals' transfers to their parents.

labor supply decision as given, each child is assumed to take the other sibling's transfer behavior as given. Hence for each child:

$$TR_j = TR(V^C, w^C, \overline{L^P}, \overline{\sum_{j \neq k} TR}; \theta^C) \quad (14)$$

The outcome is then represented by the intersection between the parent's reaction function and the reaction function of all the children. The resultant reduced-form transfers equation is:<sup>13</sup>

$$\Sigma TR = \pi_{0n} + \pi_{1n} Z^{NC} + \pi_{2n} Z^P + u_1 \quad (15)$$

where  $Z^{NC}$  is a vector containing the values of  $V^C$ ,  $w^C$  and  $\theta^C$  which pertain to non-coresiding children. Unlike the single child case, the children's characteristics can now affect transfers in two ways: via their direct effect on the amount of money a child wishes to transfer and indirectly through their siblings' propensities to transfer.

### ***Living Together:***

If the parent instead lives with one or more children then, as suggested by equation (10), the parent's labor supply will be a function of parental characteristics and the characteristics of the coresiding children. In the multiple child case there is, however, the possibility that in addition to coresiding children, the parent will also have and receive transfers from non-coresiding children. Hence, the sum of transfers received from these non-coresiding children will also enter the labor supply equation:

$$LS^P = \beta_{0n} + \beta_{1r} Z^P + \beta_{2r} Z^{CC} + \gamma_{1r} \Sigma TR^* + \varepsilon_2 \quad (16)$$

where  $Z^{CC}$  is defined analogously to  $Z^{NC}$ .

The total transfers received from these children will, as in equation (15), be a function of their own characteristics and their siblings' characteristics—both

coresiding and non-coresiding siblings. The coresiding children's characteristics also enter the reduced form transfers equation via their effect on labor supply. Hence, the transfers equation becomes<sup>14</sup>:

$$\Sigma TR = \pi_{0r} + \pi_{1r}Z^P + \pi_{2r}Z^{NC} + \pi_{3r}Z^{CC} + u_2 \quad (17)$$

Although transfers received from coresiding children are not observed in the data, the estimation strategy controls for transfers received from coresiding children by controlling for coresidency.

***The Coresidency Decision:***

As above, the coresidency decision is a function of the utility obtained in each of the two possible states.<sup>15</sup> It hence includes all of the variables in the system. In addition, it will be a function of variables that reflect transactions costs associated with moving between residency states. In Indonesia home ownership rates are high and the transactions costs are likely to be correlated with house prices. We include the average of local housing prices,  $H$ , to capture this effect. Its inclusion identifies the coresidency equation. The coresidency equation can then be written:

$$C = \eta_0 + \eta_1Z^P + \eta_2Z^C + \eta_3H + v. \quad (18)$$

The two transfer equations (15) and (17), the two labor supply equations (13) and (17), and the coresidency equation (18) comprise our empirical model. These five equations are estimated jointly using maximum likelihood estimation with the censoring of transfers and labor supply at zero taken into account. The estimation is

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<sup>13</sup> We estimate only a reduced form equation for transfers.

<sup>14</sup> Note that we are still assuming that the parent's threat point is determined by the utility the parent would receive if living alone. In the case of multiple children it is possible that if the parent did not live with the current child, s/he may live with one of the other children. We however have no way of knowing if this is the case and if so, which child would be the next preferred. The utility obtained through living alone is at least indicative of the gains the parent receives from coresiding.



performed separately for men and women because we expect the determinants of labor supply and transfers to vary with gender.

## **5. The Indonesian Family Life Survey**

The IFLS is a general household survey collected by RAND and Lembaga Demografi of the University of Indonesia. It provides data from 1993 on a random sample of 7,224 households across the Indonesian provinces in Java, Sumatra, Bali, West Nusa Tenggara, Kalimantan and Sulawesi.<sup>16</sup> This study will focus on Indonesians aged 60 years or over<sup>17</sup> and within these 7,224 households there are 2625 individuals in this age category. Information was gathered on all household members, however more detailed information was collected for selected householders and is available for 1891 elderly individuals.<sup>18</sup> Because we are interested in examining the relationship between the labor supply of the elderly and the amount of financial support they receive from their children, we will focus on the sample of 1507 individuals who report having at least one living child over the age of 18. Dropping observations which have missing values for one or more of the explanatory variables results in a sample size of 1429.

The IFLS asks respondents how many hours they worked last week, how many hours they usually work per week and how many weeks they usually work per year. We thus have three potential measures of the elderly parent's labor supply: hours last week, normal hours per week and a constructed measure of annual hours

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<sup>15</sup> Note that Pezzin and Schone (1990) consider nursing home care as an additional form of living arrangement. Such care is very rarely available in Indonesia and so is not modelled here.

<sup>16</sup> A second round of the survey was conducted in 1997 but was not available at the time of writing. A third round was collected in 2000.

<sup>17</sup> In 1993 the average life expectancy in Indonesia was 63 (World Bank, 1995).

(normal hours per week multiplied by normal weeks per year).<sup>19</sup> All three measures produced very similar results. Here we focus on normal weekly hours because this measure is less sensitive to any seasonality effects reflected in hours last week and is more easy to interpret than the annual hours measure.<sup>20</sup>

The IFLS is unusual in that it provides relatively detailed data on all of the living non-coresiding children of the elderly parent. This includes data on the age, gender, marital status, educational attainment of the children and whether they live in the same province as the parent.<sup>21</sup> This general demographic data is also available for the parent and the coresiding children. Another attractive feature of the IFLS is that it provides information about the amount of money children have transferred to their parents in the 12 months preceding the survey.

We are also fortunate in that the IFLS provides information about the labor market sector (self-employed, government, private industry, not employed) in which the parent worked 20 years ago. Unlike current sector of employment, this variable is not a function of current labor supply, but is likely to reflect both the availability of current employment opportunities and aspects of the elderly individual's taste parameters that may not be captured by education and the other demographic

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<sup>18</sup> These are elderly individuals who were able to provide information on non-coresiding children. This data is only available for the elderly who could answer the questions themselves. Our sample may thus under-represent the elderly who were particularly frail or disabled.

<sup>19</sup> Specifically, normal hours per week is the response to the following question "Normally what is the approximate total number of hours you work per week?"

<sup>20</sup> The IFLS asks people about the hours they normally worked on their primary job and their secondary job. We summed these two figures to arrive at the total hours normally worked. A small but not insignificant percentage of the sample reported working long hours on both jobs such that the total hours worked was not feasible. As a result normal hours worked was top-coded at 84 hours per week. We experimented with allowing for this upper censoring in the estimation and found that it made little difference. The MLE results below control for lower censoring only.

<sup>21</sup> Indonesia had 27 provinces in 1993.

variables in the analysis. Summary statistics and variable definitions are shown in appendix table A1.<sup>22</sup>

Table 1 shows the living arrangements of the elderly in Indonesia. The majority (62.5 percent) of Indonesian parents over the age of 60 are living with one or more of their children. These are the parents who we will designate as “coresiding”. A further 21.3 percent are living with their spouse, with only 7.0 percent living alone. Thus, “non-coresiding” is not synonymous with living alone.

**Table 1 here**

Table 2 provides summary statistics of transfer behavior. Overall, more than half of the elderly parents in the sample received a positive transfer from their children in the previous year, with mothers more likely to receive them than fathers. Although on average the sums of money transferred are not very large (on average the equivalent of US\$71), they are a large proportion of mean household income and an even larger proportion of mean personal income.

**Table 2 here**

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<sup>22</sup> Most of the variables used are self-explanatory. Those that are not are: other income which is defined as the sum of pension income, asset income and any other non-labor income received by the individual in the 12 months prior to the survey (but not transfer income). Assets are the assets owned by the individual (including the appropriate percentage of shared assets) and include houses/buildings, land, animals, vehicles, appliances, savings, stocks, receivables, jewelry and any other assets. The parental education category variables are dummy variables that reflect the highest level of school attended by the individual. In the case of children they reflect the number of children in each schooling category. An individual is classified as being married if s/he is not never married, divorced, separated or widowed. The previous sector of employment variables are dummy variables which reflect the sector of employment of the individual’s primary job 20 years ago. The variable “Out of Province” is the number of children who live in a different province to the parent. The average house price is the village average as reported by the village head. The dependent variable in the transfers equation is the sum of transfers received from all non-coresiding children in the 12 months prior to the survey.

Table 2 also provides information about the normal weekly hours of work of Indonesia elderly. These results indicate that many Indonesian men and women remain economically active into their old age. Not surprisingly, elderly men work on average more hours than elderly women, and younger age-cohorts are working slightly more hours than are older age-cohorts (See Figure 1). Men who do not live with one or more of their children normally work an average of 34.0 hours each week, slightly more than coresiding men who work 30.0 hours on average. Indonesian women work on average about half the hours worked by men, which translates into a smaller gap between coresiding women (13.4 hours per week) and non-coresiding women (17.6 hours per week).

**Figure 1 here**

## **6. Empirical Results**

As discussed above, our theoretical framework suggests an empirical model in which labor supply decisions are simultaneously determined with transfers and coresidency status. In order to account for simultaneity between these three forms of old-age support, the coresidency, transfers, and labor supply equations are estimated jointly using maximum likelihood estimation. The statistical significance of the estimated correlations between the error terms confirms the potential for the estimates to be biased if the equations were estimated in isolation. Parallel results assuming that these forms of support are unrelated are presented in Appendix tables

A2 and A3 for the purpose of comparison.<sup>23</sup> Below we discuss the results for the coresidency and transfers equations before turning to the labor supply results.

### ***Coresidency Among Indonesian Elderly:***

Elderly individuals are defined to be coresiding ( $C = 1$ ) if they live with one or more adult children and non-coresiding ( $C = 0$ ) otherwise.<sup>24</sup> For ease of interpretation we focus on the resulting marginal effects rather than the coefficient estimates.<sup>25</sup>

### **Table 3 here**

The main finding of the coresidency equation is that the characteristics of the elderly parent's children seem to play a greater role in determining coresidency than the characteristics of the parents themselves. (See Table 3.) As will be discussed below, this is somewhat more true for men than women. Both elderly men and women are significantly more likely to be living with unmarried children (who are less likely to have moved out of the parental home) than married children. Children's educational attainment is also a significant determinant of coresidency. Mothers are significantly more likely to be coresiding if they have children with a secondary education, compared with children with a lower education. This could indicate that coresidency may respond to children's income and that more educated children are better able to afford having their parents live with them. Cameron (2000) however

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<sup>23</sup> The correlations and their t-statistics are reported down the bottom of Table 5. The marginal effects differ slightly across the jointly and independently estimated equations, as does the significance of some of the variables--most noticeable transfers are strongly significant in the non-coresiding women's labor supply equation ( $t=3.37$ ) but only marginally so once we allow for their endogeneity ( $t=1.91$ ). The qualitative results however remain largely the same.

examined this issue directly and found no evidence that Indonesian parents tend to live with wealthier children. This interpretation is further confounded by the finding that fathers are significantly less likely to coreside if they have tertiary educated children.

The coefficients on children's marital status indicators suggest that coresidency may be more a result of evolving household structure and children aging than an explicit form of old-age support. This is reinforced by the coefficient on the age for elderly women. The age of an elderly woman exerts a strongly significant negative effect on the probability that women coreside. Aging ten years decreases the probability of elderly women coresiding by more than ten percentage points. This negative relationship suggests that Indonesian children are more often living with their mothers than the converse. As mothers (and children) age, children are more likely to move out. This may not show up for men because divorce is not uncommon in Indonesia and older men often remarry younger women and have relatively young families. The IFLS data do not allow us to establish who is living with whom. Even if we knew a lot more about the household this would be difficult to ascertain because over time we would expect that responsibility would shift gradually from the parent to the child in either case.<sup>26</sup> It is also possible that—given the nature of the data—we are capturing the effects of birth-cohorts rather than aging.

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<sup>24</sup> Similarly, children are defined to be coresiding if they live with the parent, and non-coresiding if not. Note that it is possible for a non-coresiding child to have a coresiding parent. This simply implies that the parent lives with one of the child's siblings rather than on his or her own.

<sup>25</sup> Marginal effects are calculated at the means.

<sup>26</sup> We have defined adult children to be children aged over 18. Restricting the definition of coresidency to be living with a child aged over 25 does not change the negative effect of age. Given that our sample of parents is over the age of 60, the majority of the children in the sample are older than this in any case.

Frankenburg, Beard and Saputra (1999) however used panel data for Indonesia and similarly found age to be negatively related to the *transition* to coresidency.<sup>27</sup>

Mothers' assets<sup>28</sup> and non-earned income are negatively related to their probability of coresiding—suggesting an ability to buy privacy—but the effect is very small in magnitude. An extra Rp200,000 of non-earned income (approximately doubling the average) decreases the probability of coresiding by less than 2 percentage points.<sup>29</sup>

Previous work sector is included in the coresidency equation because of its potential effect on labor supply and because of the need to include all of the variables in the system of equations in the coresidency equation. Fathers who were self-employed 20 years ago are 14 percentage points less likely to be coresiding than other fathers. It is not clear from this reduced-form coresidency equation whether the negative effect of prior self-employment status on coresidency occurs because these fathers are more likely to be currently employed (see below) or for some other reason. We do know, however, that there is a strong correlation between rural residency and being self-employed 20 years ago, presumably because many of the self-employed were farmers. In contrast to previous studies of coresidency in Indonesia, the rural/urban status of the household was found not to be a significant determinant of coresidency—at least for fathers. It was however strongly significant

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<sup>27</sup>Their study covered a four-year period. We tried including a quadratic in age but it was insignificant.

<sup>28</sup>We treat assets as a pre-determined variable. It can be argued that assets are actually endogenous as the parent may run them down if s/he does not receive income support from other sources. We examined the asset data however and found no evidence of asset values changing systematically, either increasing or decreasing, with age over 60. We also estimated the entire system of equations without the inclusion of the asset variable and found none of the other parameters to be affected by its presence. We chose to present the results that include the asset variable because theoretically wealth could play an important role in the choices elderly individuals make regarding their income support.

<sup>29</sup> The Indonesian currency is the Rupiah. In 1993 US\$1 bought approximately Rp2500.

before the inclusion of employment status. Employment status thus appears to be picking up the effect of rural residence.

Importantly for the identification of the coresidency equation, average house price in the parent's locality is significantly related to the probability of coresidence (at the one percent level for men and the ten percent level for women) and has a positive sign. The transaction's costs associated with moving out of the parental home will be larger in regions with more expensive housing and this may dissuade children from doing so.

#### ***Transfers to Indonesian Elderly from Non-Coresiding Children:***

The determinants of transfers to elderly parents are presented in Table 4.<sup>30</sup> Although there is evidence that transfers are targeted to the elderly population as a whole (Secondi, 1997; Ravallion and Dearden, 1988), our analysis suggests that within the elderly population financial transfers from children are not in general related to parental need as measured by the elderly parent's own characteristics. Disabled and older parents do not receive any more in transfers than their able-bodied, younger counterparts. Older, coresiding fathers actually receive less with transfers falling by approximately 10,000 rupiah for each year the father ages, though this effect is significant at only the ten percent level.<sup>31</sup> Furthermore, wealthier parents (as measured by assets and unearned income) receive significantly more transfers from their non-coresiding children. Non-coresiding men are the only

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<sup>30</sup> The IFLS also provides information on transfers to children from parents. We experimented with subtracting this amount from transfers from children and using a net measure of transfers that would then not be censored at zero. It however seems that the motivations for these two types of transfers differ significantly. Using the net measure of transfers instead of the gross measure significantly reduced the predictive power of the transfers equation. For the elderly transfers from children are much more quantitatively important than transfers in the other direction. We hence elected to use gross transfers to parents as our measure of transfers.



exception. Other studies have found similar results and on this basis have rejected altruism as a motivation for transfers (Cox and Rank (1992) for example). Here the effect is very small though. For example, increasing non-coresiding women's asset levels by Rp1,000,000 (26 percent of the mean asset level) results in transfers increasing by Rp 1,900 per year.

**Table 4 here**

Finally, there is generally a positive relationship between transfers and parental education among those mothers and fathers coresiding with adult children. Only among non-coresiding parents does it appear to be the case that transfers are targeted towards less educated—and perhaps more disadvantaged—parents.

For coresiding parents there is further evidence that transfers respond little to parental need—as measured by the characteristics (number and education level) of coresiding children. Transfers from non-coresiding children to their fathers are lower as the overall number of unmarried coresiding siblings increases, but otherwise there is little relationship between the number of coresiding siblings and transfers. In fact, non-coresiding children appear to transfer more when their coresiding siblings have higher education levels (and presumably greater earnings capacity), though this effect is only marginally significant.

Just as transfers from non-coresiding Indonesian children to their elderly parents are in the main not responsive to parental need as captured by the characteristics of parents and coresiding siblings, they are also appear to be only loosely related to the ability to give. While unmarried children (who most likely have fewer dependents) transfer more each year to their non-coresiding mothers than

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<sup>31</sup> Given the cross-sectional nature of our data, this pattern may reflect differences across birth-

do their married siblings, they make smaller transfers to their fathers and coresiding mothers. Furthermore, there is little relationship between non-coresiding children's education levels and the transfers they provide mothers and fathers. Although the coefficients on the variable indicating the number of tertiary educated children is large and positive in each case, it is never significant at the 5 percent level (and at the 10 percent level only for coresiding men).

The results above are consistent with some of the findings from Lillard and Willis's (1997) work on the motives for intergenerational transfers in Malaysia. With the elderly couple the unit of analysis, they find only limited support for the view that the provision of old-age security is the motive behind the transfers received from non-coresiding children. Specifically, they find no relationship between the age of the elderly couple and the amount of transfers received and increases in the father's income result in larger rather than smaller financial transfers.<sup>32</sup>

#### ***The Labor Supply of Indonesian Elderly:***

The results from the labor supply equation are shown in Table 5. They find that generally financial transfers from Indonesian children are not a substitute for the income support provided by the elderly parent's own labor supply. Transfers are negatively and significantly related to normal weekly hours of work only for non-coresiding mothers (p-value=0.056). In addition, this effect is small—increasing transfers by Rp100,000 (mean transfers are Rp217,200) leads to a 1.7 hour reduction in normal weekly hours.

#### **Table 5 here**

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cohorts rather than the effects of aging *per se*.

Like transfers, asset levels and unearned income also appear to play little part in the labor-supply decisions of elderly Indonesians. Elderly individuals with higher asset levels or with more unearned income do not enjoy significantly more leisure in their old age. To some extent these results may reflect that in Indonesia access to pension income is restricted almost exclusively to government officials. The impact of pension income on hours worked might thus be captured by the coefficients on the previous work status variables. Being a government employees 20 years ago significantly reduces the hours worked in old age for both men and women. Coresiding women (men) who were previously employed in the government work on average 12.5 (21.4) hours per week less in their old age than women who were self-employed and 8.2 (18.5) hours less than women who were private employees. Previous labor market sector may also proxy for access to opportunities for continued employment. For example, self-employed individuals may be able to continue running their businesses into their old age, while public- and private-sector employees may find themselves forced to retire. Rural/urban status is likely to further capture both the opportunity for and returns to employment. Everything else equal, non-coresiding elderly women and coresiding elderly men work more hours in rural labor markets than in urban areas.

The labor-supply behavior of the Indonesian elderly is also related to the capacity for market work. For example, normal hours of work decline between 1.5 and 0.4 hours per week with each year of age. Gender differences in the effects of age on labor supply suggest a convergence in the hours of work of elderly men and

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<sup>32</sup> Lillard and Willis (1997) also conclude that coresidency is exogenous to the transfer decision but that coresiding fathers are more likely to receive transfers than are non-coresiding fathers. They find that coresidency does not affect the amount of transfers received by mothers.

women as they age. Furthermore, disabled individuals work as many as 20.8 fewer hours per week.<sup>33</sup>

At the same time, to the extent that market wages increase with the level of education, our results imply that among non-coresiding parents it is those individuals facing the lowest returns to market work (but perhaps the greatest need) who continue to work into their old age. Specifically, non-coresiding men with no education at all are predicted to work 12.0 hours more per week than non-coresiding men with at least a secondary school education. Among non-coresiding women the difference is even higher (18.0 hours). In contrast, coresiding parents' hours of work do not vary significantly with education. Thus coresidency might be important in allowing elderly individuals to lower their hours of work.<sup>34</sup>

For both men and women the characteristics of coresiding children have no effect on the number of hours their parents work each week. This is particularly striking since it seems to suggest that overall household resources—as reflected by the numbers of adult children and their education levels—are unrelated to the labor-

supply decisions of elderly parents. Controlling for the number of adult coresiding children (i.e., the number of married and non-married children), elderly parents who live with children who are relatively better educated (and therefore presumably have higher earnings) do not work less in their old age.<sup>35</sup>

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<sup>33</sup> Individuals are classified as disabled if they report having difficulty standing from sitting, dressing or going to the bathroom by themselves.

<sup>35</sup> Interactions between children's marital status and gender were insignificant.

## **7. Conclusions:**

In this paper we estimate the determinants of elderly labor supply, receipt of transfers and coresidency jointly, thus formally acknowledging the interdependency of these forms of old-age support. Our goals are to: 1) examine the quantitative importance of each form of support, 2) to establish whether transfers and coresidency are responsive to the needs of the parents and the ability of the children to give, 3) to identify the determinants of elderly labor supply and 4) to examine the relationship between these three forms of support.

Our results indicate that all three forms of old-age support appear to be prevalent and quantitatively important. However coresidency appears to be a result of evolving household structure, rather than an explicit form of support for elderly parents. Transfers from non-coresiding Indonesian children to their elderly parents do not seem to be strongly related to parental need as captured by the parent's own characteristics and the characteristics of coresiding siblings. Nor do transfers appear to be strongly related to the ability to give as measured by non-coresiding children's characteristics.

Possibly the most important finding is that financial transfers from Indonesian children do not appear to be a substitute for the income support provided by the elderly parent's own labor market work. Only non-coresiding women reduce their hours of work as their children's transfers become more generous and this effect is relatively small. The labor supply of coresiding elderly parents is also unrelated to the characteristics of their coresiding children. This suggests that the labor supply decision of elderly parents may be unrelated to overall household resources.

We can only speculate as to why transfers from children don't result in parents devoting less hours to the labor market. It may be that transfers are too unpredictable to be relied upon or that they are not large enough to affect an elderly person's labor supply. Alternatively, there may be either cultural or emotional motivations for continuing to work into old age.

There is little to suggest that the pressure for elderly Indonesians to continue to work to support themselves will decrease in the future. As the size of the elderly population increases, the resources needed to support them will also increase. The extent to which children will be able to meaningfully contribute toward meeting this burden through financial transfers will depend in part on the rate of economic growth. Even if children are able to increase financial transfers to parents, our results suggest that this may have little effect on parents' labor supply. Increasing internal migration—driven by greater labor market mobility—will also put downward pressure on coresidency rates. Thus, it appears that old-age support is likely to become an increasingly important issue for policymakers in Indonesia and other developing nations.

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Figure 1: Labor Supply by Age and Gender

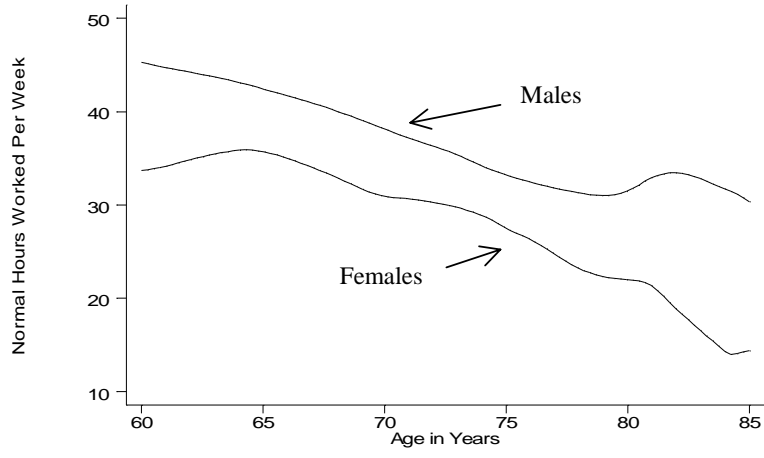


Table 1: Living Arrangements of the Indonesian Elderly

<i>Living Arrangement (N=2625)</i>	Percentage of elderly (%)
Living with adult children	62.51
Living with spouse and others (not children)	7.60
Living with others (not spouse or children)	9.02
Living with spouse only	13.67
Living alone	7.03

\* Appropriate sampling weights were used to derive the figures in this table. Source: Cameron (2000).

Table 2: Mean Transfers, Proportion Receiving Transfers, and Hours of Work by Coresidency Status and Gender

	Women		Men	
	Coreside		Coreside	
	No	Yes	No	Yes
Mean Annual Transfers (Rp 10 <sup>3</sup> )	217.2	160.0	186.2	185.4
Proportion Receiving Transfers (%)	70.2	52.9	66.6	48.9
Mean Transfers/Mean Household Income (%)	35.6	6.8	28.2	9.9
Mean Transfers/Mean Individual Income (%)	115.5	34.9	33.8	16.9
Proportion Working (%)	55.6	39.0	83.4	72.0
Mean Normal Weekly Hours Worked	17.6	13.4	34.0	30.3

These means are calculated over the full sample, including zero values.

Table 3: The Determinants of Coresidency for Elderly Indonesians  
(Probit Marginal Effects and Standard Errors)

	Women		Men	
	Marginal Effect	Standard Error	Marginal Effect	Standard Error
<b>Parents Income</b>				
Other Income (Rp10 <sup>6</sup> )	-0.096	(-3.71)	-0.022	(-1.16)
Assets (Rp10 <sup>6</sup> )	-0.001	(-1.91)	0.001	(1.39)
<b>Parents Characteristics</b>				
Age	-0.011	(-3.41)	-0.001	(-0.16)
Married	-0.067	(-1.57)	-0.005	(-0.08)
Disabled	0.083	(1.24)	-0.046	(-0.50)
Primary Education	-0.029	(-0.58)	-0.018	(-0.42)
Secondary/Tertiary Education	-0.074	(-0.72)	0.008	(0.09)
Rural	-0.083	(-1.73)	-0.028	(-0.54)
<b>Previous Work Status</b>				
Self-Employed	-0.068	(-1.57)	-0.140	(-2.17)
Government	0.037	(0.21)	-0.109	(-1.04)
Private	-0.100	(-1.40)	-0.084	(-1.14)
<b>Children's Characteristics</b>				
Married	-0.002	(-0.17)	0.016	(1.53)
Not Married	0.150	(6.45)	0.177	(8.69)
Secondary Education	0.037	(2.61)	0.003	(0.20)
Tertiary Education	-0.023	(-0.93)	-0.054	(-2.16)
<b>Local Housing Market</b>				
Average House Price (Rp10 <sup>6</sup> )	0.036	(1.73)	0.080	(3.80)
N	720		709	

Table 4: Transfers (in Rp 1000) from Non-Coresiding Children for Indonesian Elderly  
Based on Joint Model of Coresidence, Transfers, and Labor Supply  
(Marginal Effects and t-statistics)

	Coreside Women		Non-Coreside Women		Coreside Men		Non-Coreside Men	
Parental Resources								
Other Inc. (Rp10 <sup>6</sup> )	46.4	1.95	105.4	2.49	51.8	2.56	37.6	0.91
Assets (Rp10 <sup>6</sup> )	1.9	3.51	2.6	1.82	-0.1	-0.12	2.4	1.32
Parental Characteristics								
Age	0.8	0.23	3.1	0.69	-10.4	-1.94	-3.1	-0.66
Education <sup>a</sup> :								
Primary	88.0	2.04	8.7	0.12	130.6	2.36	-146.8	-2.52
Secondary	313.3	2.92	-376.4	-2.41	6.4	0.05	-222.0	-1.77
Married <sup>b</sup>	-108.7	-2.74	-175.7	-2.72	-2.0	-0.02	15.4	0.15
Disabled	-1.5	-0.03	-19.1	-0.18	-74.9	-0.56	7.2	0.06
Rural	83.5	2.14	-46.0	-0.74	125.0	2.10	119.5	1.62
Outside	-2.4	-0.14	22.1	0.89	28.8	1.09	13.1	0.56
Previous Work Status <sup>c</sup>								
Self-Employed	7.9	0.19	-71.1	-1.17	135.2	1.54	-8.2	-0.08
Government	-310.5	-1.69	559.9	2.35	-86.5	-0.53	-43.6	-0.28
Private	-41.4	-0.58	-204.2	-1.94	50.3	0.53	1.2	0.01
Coresiding Children's Characteristics								
Married	21.6	0.49			55.1	0.84		
Not Married	-5.9	-0.19			-213.8	-4.97		
Secondary Educ.	-13.6	-0.43			-27.2	-0.57		
Tertiary Educ.	79.9	1.80			179.3	1.86		
Non-Coresiding Children's Characteristics								
Married	77.9	6.45	63.2	4.09	49.5	2.85	33.9	2.18
Not Married	52.0	1.71	164.3	3.84	-23.5	-0.65	-53.7	-0.97
Secondary Educ.	2.6	0.19	2.2	0.10	29.8	1.13	70.7	3.09
Tertiary Educ.	42.1	1.43	62.2	1.69	98.6	1.81	52.6	1.29
Constant	-59.4	-0.24	291.0	0.87	1079.2	2.54	166.5	0.44
N	418		302		407		302	

<sup>a</sup> Relative to no education.

<sup>b</sup> Currently living with spouse.

<sup>c</sup> Work status 20 years ago. The omitted category is not at work.

<sup>d</sup> Number in each category.

Table 5: Determinants of Weekly Normal Hours of Work for Indonesian Elderly Based on Joint Model of Coresidence, Transfers, and Labor Supply (Marginal Effects and t-statistics)

	Coreside Women		Non-Coreside Women		Coreside Men		Non-Coreside Men	
Parental Resources								
Transfers (Rp10 <sup>3</sup> )	-0.001	-0.19	-0.017	-1.94	-0.007	-0.80	-0.042	-0.54
Other Inc. (Rp10 <sup>6</sup> )	1.592	1.47	0.733	0.26	0.024	0.02	9.365	0.49
Assets (Rp10 <sup>6</sup> )	-0.002	-0.08	-0.005	-0.06	0.043	1.13	-4.722	-0.62
Parental Characteristics								
Age	-0.653	-3.35	-0.447	-1.69	-1.413	-5.47	-1.468	-6.73
Education <sup>a</sup> :								
Primary	0.520	0.26	2.309	0.79	-4.046	-1.22	-5.065	-1.81
Secondary	4.481	0.96	-17.962	-2.32	-8.175	-1.38	-11.950	-2.14
Married <sup>b</sup>	3.083	1.86	-1.306	-0.48	5.683	1.06	7.656	1.65
Disabled	-6.748	-2.32	-13.560	-2.62	-20.819	-3.48	-6.074	-1.08
Rural	-0.216	-0.12	5.866	1.93	5.307	1.70	0.889	0.29
Previous Work Status <sup>c</sup>								
Self-Employed	15.818	7.19	14.308	5.22	14.422	3.23	18.828	4.02
Government	3.362	0.38	24.072	1.91	-6.963	-1.17	-3.679	-0.52
Private	11.557	3.79	19.548	4.59	11.525	2.58	11.412	2.22
Coresiding Children's Characteristics								
Married	0.360	0.18			-0.916	-0.34		
Not Married	0.732	0.52			-0.567	-0.24		
Secondary Educ.	-1.863	-1.35			-0.246	-0.13		
Tertiary Educ.	-0.835	-0.31			-5.491	-1.49		
Constant	30.567	2.45	36.133	1.59	102.763	4.64	103.765	5.98
$\rho(u, \varepsilon)$	0.24	1.37	-0.07	-0.35	0.17	0.92	0.16	0.66
$\rho(v, \varepsilon)$	0.42	3.87	0.68	2.47	-0.12	-0.41	0.98	8.63
$\rho(u, v)$	0.01	0.02	-0.19	-0.54	-0.41	-2.51	0.09	0.36
N	418		302		407		302	

<sup>a</sup> Relative to no education.

<sup>b</sup> Currently living with spouse.

<sup>c</sup> Work status 20 years ago. The omitted category is not at work.

<sup>d</sup> Number in each category.

Appendix Table 1:  
Mean Parental and Child Characteristics by Gender and Coresidency

	Women		Men	
	Non-Coresiding	Coresiding	Non-Coresiding	Coresiding
<b>Parental Income/Wealth</b>				
Other Income(Rp10 <sup>5</sup> )	Rp1.270	Rp1.650	Rp1.412	Rp2.757
Assets(Rp10 <sup>6</sup> )	Rp3.838	Rp5.255	Rp3.723	Rp7.866
<b>Parent's Characteristics<sup>a</sup></b>				
Age (years)	67.3	65.1	66.9	66.0
Primary	0.23	0.26	0.55	0.55
Secondary/Tertiary	0.05	0.04	0.07	0.12
Married	0.42	0.46	0.91	0.91
Disabled	0.09	0.10	0.05	0.05
Rural	0.66	0.54	0.74	0.58
<b>Previous Employment Sector<sup>a</sup></b>				
Self-Employed	0.42	0.31	0.65	0.53
Government	0.01	0.01	0.06	0.10
Private	0.10	0.08	0.19	0.23
Not Employed	0.47	0.60	0.10	0.14
<b>Non-Coresiding Children's Characteristics<sup>b</sup></b>				
Married	3.3	2.7	3.3	2.8
Not Married	0.4	0.3	0.6	0.4
Primary Education	2.5	1.7	2.5	1.7
Secondary Education	0.9	1.1	1.1	1.2
Tertiary Education	0.3	0.2	0.3	0.2
Out of Province	0.9	0.7	1.0	0.7
<b>Coresiding Children's Characteristics<sup>b</sup></b>				
Married		0.6		0.5
Not Married		0.8		1.2
Primary Education		0.7		0.8
Secondary Education		0.6		0.7
Tertiary Education		0.1		0.1
<b>Local Housing Market</b>				
Average House Price(Rp10 <sup>6</sup> )	Rp 8.275	Rp13.400	Rp 6.173	Rp 14.200
Average House Size (sqm)	72.9	81.3	76.6	82.6
<b>N</b>	<b>302</b>	<b>418</b>	<b>302</b>	<b>407</b>

<sup>a</sup> Unless otherwise specified, these are dummy variables.

<sup>b</sup> Numbers of children in each category.

**Figure A1: Kernel Density Estimate of Normal Hours Per Week**

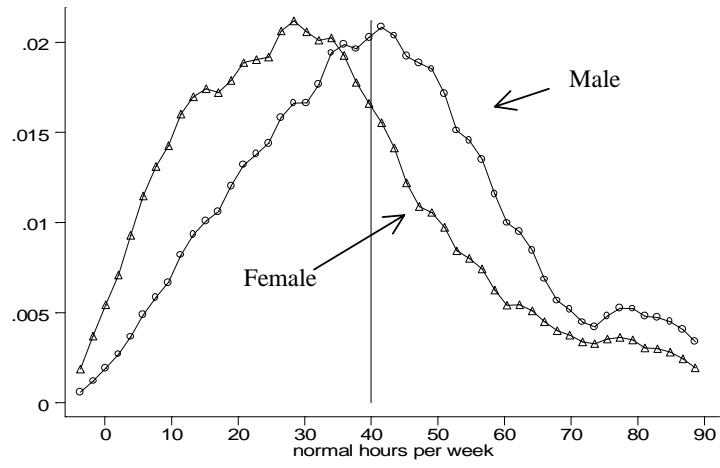




Table A2: Transfers from Non-Coresiding Children for Indonesian Elderly  
Based on Single Equation Model  
(Tobit Marginal Effects and t-statistics)

	Coreside Women		Non-Coreside Women		Coreside Men		Non-Coreside Men	
Parental Resources								
Other Inc. (Rp10 <sup>6</sup> )	24.712	(0.86)	157.681	(3.22)	35.999	(2.04)	28.573	(0.81)
Assets (Rp10 <sup>6</sup> )	1.907	(2.21)	2.988	(1.90)	0.326	(0.44)	1.844	(1.48)
Parental Characteristics								
Age	-3.898	(-1.06)	6.746	(1.30)	-6.871	(-1.52)	-3.163	(-0.66)
Education <sup>a</sup> :								
Primary	82.558	(1.71)	30.436	(0.37)	70.216	(1.24)	-153.667	(-2.63)
Secondary	278.218	(2.81)	-330.425	(-1.84)	-30.896	(-0.31)	-213.905	(-1.69)
Married <sup>b</sup>	-118.664	(-2.76)	-110.894	(-1.51)	84.425	(0.90)	8.940	(0.09)
Disabled	29.374	(0.45)	-42.426	(-0.34)	-58.448	(-0.51)	3.880	(0.03)
Rural	62.667	(1.44)	15.122	(0.20)	14.087	(0.25)	111.318	(1.60)
Outside	3.855	(0.20)	24.796	(0.86)	-6.014	(-0.26)	15.899	(0.67)
Previous Work Status <sup>c</sup>								
Self-Employed	2.272	(0.05)	-27.456	(-0.39)	28.855	(0.38)	-13.692	(-0.14)
Government	-293.847	(-1.47)	504.717	(1.78)	-53.855	(-0.50)	-43.171	(-0.28)
Private	-39.443	(-0.52)	-94.005	(-0.81)	42.740	(0.52)	4.143	(0.04)
Coresiding Children's Characteristics								
Married	16.736	(0.36)			70.637	(1.43)		
Not Married	33.251	(0.99)			12.922	(0.38)		
Secondary Educ.	-9.929	(-0.29)			-16.499	(-0.43)		
Tertiary Educ.	59.763	(0.92)			93.943	(1.54)		
Non-Coresiding Children's Characteristics								
Married	71.633	(5.67)	67.844	(3.82)	59.779	(3.94)	33.216	(2.17)
Not Married	79.218	(2.51)	102.731	(2.10)	79.903	(2.50)	-43.883	(-1.22)
Secondary Educ.	3.626	(0.22)	4.522	(0.17)	26.080	(1.21)	77.383	(3.53)
Tertiary Educ.	21.109	(0.58)	22.629	(0.50)	37.295	(0.95)	41.694	(1.06)
Constant	-9.780	(-0.04)	-408.573	(-1.10)	19.110	(0.05)	213.975	(0.58)
N	418		302		407		302	

<sup>a</sup> Relative to no education.

<sup>b</sup> Currently living with spouse.

<sup>c</sup> Work status 20 years ago. The omitted category is not at work.

<sup>d</sup> Number in each category.

Table A3: Determinants of Weekly Normal Hours of Work for Indonesian Elderly  
Based on Single Equation Model  
(Marginal Effects and t-statistics)

	Coreside Women		Non-Coreside Women		Coreside Men		Non-Coreside Men	
Parental Resources								
Transfers (Rp10 <sup>3</sup> )	-0.001	(-0.80)	-0.007	(-3.37)	0.001	(0.47)	0.003	(0.78)
Other Inc. (Rp10 <sup>6</sup> )	2.403	(2.04)	-0.606	(-0.36)	-0.300	(-0.33)	0.087	(0.05)
Assets (Rp10 <sup>6</sup> )	0.004	(0.10)	-0.023	(-0.45)	0.039	(1.02)	-0.039	(-0.68)
Parental Characteristics								
Age	-0.690	(-3.89)	-0.462	(-2.61)	-1.317	(-5.84)	-1.601	(-6.85)
Education <sup>a</sup> :								
Primary	0.736	(0.37)	1.612	(0.62)	-4.771	(-1.75)	-4.926	(-1.75)
Secondary	5.687	(1.37)	-15.148	(-2.21)	-8.083	(-1.64)	-11.162	(-1.88)
Married <sup>b</sup>	3.642	(2.11)	-0.440	(-0.19)	4.617	(1.03)	8.078	(1.62)
Disabled	-7.934	(-2.46)	-12.400	(-2.67)	-19.682	(-3.12)	-6.141	(-1.02)
Rural	-0.012	(-0.01)	5.285	(2.10)	5.066	(1.83)	-0.950	(-0.29)
Previous Work Status <sup>c</sup>								
Self-Employed	18.068	(9.29)	13.545	(5.63)	13.342	(3.48)	18.713	(3.75)
Government	3.624	(0.48)	16.414	(1.56)	-6.761	(-1.19)	-3.610	(-0.47)
Private	13.131	(4.57)	19.355	(5.24)	10.849	(2.59)	12.535	(2.27)
Coresiding Children's Characteristics								
Married	0.487	(0.26)			-1.086	(-0.43)		
Not Married	0.443	(0.31)			0.138	(0.09)		
Secondary Educ.	-2.346	(-1.70)			-0.503	(-0.29)		
Tertiary Educ.	-0.932	(-0.37)			-6.437	(-2.04)		
Constant	32.969	(2.74)	31.115	(2.51)	92.827	(5.28)	119.268	(6.71)
N	418		302		407		302	

<sup>a</sup> Relative to no education.

<sup>b</sup> Currently living with spouse.

<sup>c</sup> Work status 20 years ago. The omitted category is not at work.

<sup>d</sup> Number in each category.

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