Friday Sept 22 –

PRELIMINARY – FIRST DRAFT

Old Age Support in Indonesia: Labor Supply, Intergenerational Transfers and Living Arrangements.

Lisa Cameron*
Dept of Economics
University of Melbourne

and

Deborah Cobb-Clark
Economics Program
Research School of Social Sciences
And
National Centre for Development Studies
Australian National University

28th March 2000

Abstract

This is the first paper of which we are aware that attempts to formally model the labor supply behavior of elderly individuals in a developing country. 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 support. A simultaneous equation, endogenous switching framework allows us to examine the labor supply behavior of elderly Indonesians while also modeling money transfers from their children and coresidency. We find that Indonesians, especially men, continue to work well into old age. Male labor supply does not appear to be responsive to either money transfers from children nor coresidency. This is consistent with elderly males deriving some utility from being actively engaged in the work force. We find some evidence that female labor supply may be slightly more responsive to transfers. Living with children significantly reduces the labor supply of lowly-educated elderly women.

* We'd like to thank Tom Crossley for helpful comments. Correspondence should be addressed to l.cameron@ecomfac.unimelb.edu.au

1. Introduction

The rapidly aging populations of industrialized nations have received a lot of attention recently. That the populations of many developing countries are also aging significantly is much less widely known.[1] The consequences of population aging in developing nations are likely to be just as serious as those experienced by developed countries, but may present very different challenges. For instance, the virtual absence of established pension schemes prevalent in wealthier countries suggests an entirely different set of policy responses. 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 will be particularly strained as elderly dependency ratios increase.[2]

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. Thus, this paper focuses primarily on elderly labor supply, but develops 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 children to give. Finally, we wish to obtain an understanding of the relationship between these financial transactions – that is the

[1] Indonesia for instance has the third largest population over the age of 65 in the world (Adlakha and Rudolph,1994), and the number of Indonesian elderly is projected to increase by 400% between 1990 and 2025 (Kinsella and Taeuber,1993).

[2] 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).

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 Indonesian elderly. Specifically, coresidency, the receipt of transfers and the parent's labor supply are determined as the outcome of bargaining between children and parents.[3] 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 primarily a function of the characteristics of their coresiding siblings rather than parental need (as measured by parental characteristics) or the ability to give (as measured by non-coresiding children's characteristics). In general, elderly labor supply is not sensitive to other income support in the form of coresidency or transfers. The exception is poorly-education, elderly women for whom coresidency seems to act as an important form of support by allowing these women to significantly reduce their hours of work.

The outline of the paper is as follows. In Section 1 we review the existing literature on support for the elderly in developing countries. In Section 2 we set up the theoretical bargaining model, while in Section 3 we discuss the IFLS data in more depth. In Section 4, we explain the estimation technique and present the results

[3] 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 labor

produced by estimating the system of equations suggested by the theory. Finally, Section 5 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, remarkably little has been written on the labor supply of the elderly in these nations, or elsewhere. The only studies of elderly labor supply of which we are aware are Cain (1991) which provides a descriptive account of the daily activities of a small sample of elderly individuals in rural Bangladesh, and Hanoch and Honig (1983) which examines the labor supply behavior of the elderly in the United States. 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.[4]

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 variables on coresidency.

---

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).

[4] Niehof (1995), although not dealing directly with labor supply, presents an interesting overview of the experiences of elderly Indonesians.

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.[5]

The literature on intergenerational transfer behavior is much more developed and builds on a significant literature on transfers in developed countries. Research 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.[6] 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.[7]

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 also 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), however, have been inconclusive.[8] Finally, Ravallion and Dearden (1988) find that

---

[5] See Hoerger, Picone and Sloan (1996) for a paper that examines elderly living arrangements in the United States.

[6] 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 as to how much to transfer to their respective parents.

[7] Lillard and Willis (1997) provide more extensive descriptions of each of these motives.

[8] 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

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.[9] Unlike the previous research on transfers, we are specifically focused 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.[10] 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.

3. Theoretical Model and Estimating Equations

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

---

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).

[9] 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. See Lillard and Willis (1997) for Malaysia, Secondi (1997) for China, and Ravallion and Dearden (1988) for rural Java.

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. We then expand the model to allow for the possibility of multiple children.

The Single Child Case:

Living Separately:

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

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

$$U^P(X^P, L^P, W(L^P; D); \theta^P) \tag{2}$$

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

[10] 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.

child's utility function introduces an element of altruism to the model.[11] The parent's "well-being" is modelled as a function of the elderly individual's labor supply and any long-term disability experienced by the individual. Finally, θ^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

$$w^C T + V^C = X^C + w^C L^C + TR \tag{3}$$

$$w^P T + V^P + TR = X^P + w^P L^P \tag{4}$$

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).

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

[11] 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.

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:

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

The child similarly decides upon a consumption level and labor supply which determines transfers. Hence:

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

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:

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

$$\Psi^P = \Psi^P(V^P, w^P, TR^*). \tag{8}$$

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:

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

Note that Ψ^C and Ψ^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:

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

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

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:

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

The Estimating Equations 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 the elderly individual may have more than one child. Most previous studies have examined parent/child pairs and ignored the existence of other children.[12] 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 parent's 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 below we develop estimating equations that acknowledge the possibility of such behavior.[13]

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:

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

where $Z^P = \{V^P, w^P, \theta^P, D\}$ is a vector of parental characteristics and ΣTR^* is the sum of transfers from all non-coresiding children. The asterisk indicates that the transfer term is endogenous and will need to be instrumented in the estimation.

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

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

---

[12] Pezzin and Schone (1999) for example.

[13] See Hiedemann, B. and S. Stern (1998) and Engers and Stern (1998) for studies that explicitly models 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.

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:[14]

$$\Sigma TR = \pi_{0n} + \pi_{1n} Z^{NC} + \pi_{2n} Z^{P} + u_2 \tag{15}$$

where Z^{NC} is a vector containing the values of V^C, w^C and θ^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.

Equations if 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:

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

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

[14] Given that this paper's primary focus is on labor supply and the difficulty in identifying the transfers equation, we only estimate the reduced form of the transfers equation.

reduced form transfers equation via their effect on labor supply. Hence, the transfers equation becomes[15]:

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

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.[16] It hence includes all of the variables in the system. In addition, for the purpose of identification we include the vector of variables H (local average housing prices and average house size) that affect coresidency directly but do not directly determine transfers or labor supply.[17] The coresidency equation is hence:

$$C = \eta_0 + \eta_1 Z^{P} + \eta_2 Z^{C} + \eta_3 H + v_5 . \qquad (18)$$

[15] 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 this is no longer the only possible threat point. That is, it is possible that in fact if the parent did not live with the current child, s/he may live with one of the other children. The parent may in fact argue this so as to strengthen his/her bargaining position within the household. If this is the case, then the parent's labor supply decision in the case where s/he coresides would include that child's characteristics. We however have no way of determining which child would be ranked next, and also whether living with that child would be more attractive to the parent than living alone. One option would be to include the characteristics of all non-coresiding children in the labor supply equation for coresiding parents. This however produces a labor supply equation which relies on functional form for identification. The utility obtained through living alone is at least indicative of the gains the parent receives from coresiding and can be justified theoretically on the grounds that the coresiding child may have imperfect information as to whether his/her siblings would be prepared to have the parent live with them and so treats the possibility as a non-binding threat point. In practical terms, this assumption means that non-coresiding children are restricted to affect their parent's labor supply only via the transfers they make to the parent.

[16] 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.

[17] Otherwise it would only be identified by the functional form of the parameter.

Equations (13), (15), (16,) (17) and (18) suggest an endogenous switching framework with coresidency as the endogenous switch. Further details are given below. Before we turn to estimation however, we discuss the data.

4. THE INDONESIAN FAMILY LIFE SURVEY

The IFLS is a general household survey. 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. This study will focus on Indonesians aged 60 years or over[18] 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.[19] 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 1430.

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 (normal

[18] In 1993 the average life expectancy in Indonesia was 63 (World Bank, 1995).

[19] 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.

hours per week multiplied by normal weeks per year).[20] We experimented with using all three measures and the results were strikingly similar across measures. We elected to focus on the measure of normal weekly hours because it attempts to overcome the seasonality which could be picked up in the measure of hours last week and is more easily interpretable than the annual hours measure.[21]

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.[22] 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 on how much 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 variables

[20] 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?"

[21] The relationship between the annual hours measure and the explanatory variables was a little weaker than for the other hours measures. We also plotted kernel density estimates of the two weekly hours measures which showed the distribution of the two measures to be very similar. 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 labor-supply tobits that are estimated below but it did not affect the results. The results below control for lower censoring only.

[22] Indonesia had 27 provinces in 1993.

in the analysis. Summary statistics and variable definitions are shown in the appendix.[23]

Table 1 shows the living arrangements of the elderly in Indonesia. The majority (62.5 %) 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. Figure 1 shows that the probability of coresiding with one or more children is lower in the older age-cohorts for women, but is more U-shaped for men.[24]

Table 1 and Figure 1 here

Transfers from non-coresiding children are on average larger to mothers than to fathers, particularly if the mother is not living with one of her children. (See Table 2.) Overall, more than one in two elderly parents received a positive transfer from their children in the previous year. Although on average the sums of money transferred are not very large (on average the equivalent of US$71), this amount does represent a large share of mean household income and an even larger share of mean

[23] 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 categories 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 and house size are the village averages 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.

personal income, particularly for non-coresiding parents. Mean transfers have an inverted u-shape relative to age (See Figure 2) first increasing and then decreasing.

Table 2 and Figure 2 here

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 3). Men who do no live with one or more of their children normally work an average of 34.1 hours each week, with coresiding men working somewhat less (23.6 hours per week). Indonesian women work on average half the hours worked by men, which translates into a smaller difference between coresiding women (13.5 hours per week) and non-coresiding women (17.6 hours per week).

5. EMPIRICAL RESULTS

As already discussed, the theoretical framework lends itself to an endogenous switching framework, with coresidency as the endogenous switch. Hence, the estimation consists of a number of steps. We begin by estimating the coresidency decision given by equation (18) using probit estimation. The reduced form transfers equations are then estimated using coresidency as the switch between equations (15) and (17). Predicted values of transfers are then used in the labor supply equation

[24] Note that the IFLS is a cross-section. Thus, Figures 1 – 3 are better thought of as capturing differences in coresidence, transfers, and labor supply by birth cohort rather than life-cycle profiles.

which is also estimated by switching regression. Both the transfers equation and the labor supply equation are estimated using Tobit regression to control for the censored nature of the dependent variable. Given the complexity of the estimation process and the lack of an analytical solution for calculating the standard errors, bootstrapping was used to generate confidence intervals.

The Coresidency Decision of the Indonesian Elderly:

The coresidency decision given by equation (17) is first estimated using probit estimation. Elderly individuals are defined to be coresiding (C = 1) if they live with one or more adult children and non-coresiding (C = 0) otherwise.[25] Results from this first stage estimation are presented in Table 3.[26]

Table 3 here

The main finding of the coresidency equation is that in general, elderly parents' demographic and human capital characteristics are not significantly related to the probability that they will coreside with at least one of their adult children. Parent's non-earned income is negatively and significantly related to their probability of coresidency, suggesting an ability to buy privacy but the effect is very small in magnitude.[27] An extra Rp200,000 (approximately doubling the average) decreases the probability of coresidency by only 2 percentage points.[28] Neither the parent's

[25] Similarly, children are defined to be coresiding if they live with the parent, and non-coresiding if not. Note that it 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.
[26] See Greene (1997) for a formal exposition of probit models.
[27] Unearned income is defined to equal the sum of pension income, asset income and any other non-labor income other than transfers.
[28] The Indonesian currency is the Rupiah. In 1993 US$1 bought approximately Rp2500.

educational attainment nor the value of the parent's assets are significant determinants of coresidency.[29]

The age of the elderly individual is strongly significant but negative in sign. Aging 10 years decreases the probability of coresidency by seven percentage points. The negative sign suggests that Indonesian children may more often be living with parents than the converse. As the parents (and children) age, the children are more likely to move out. The data do not allow us to establish who is living with whom, but this would be difficult to ascertain even if we knew a lot more about the household because over time we would expect that responsibility would shift gradually from the parent to the child. 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 are over the age of 60, the majority of the children in the sample are older than this in any case. It is also possible that—given the nature of the data—we are capturing the effects of birth-cohorts rather than aging. Frankenburg, Beard and Saputra (1999) however used panel data for Indonesia and similarly found age to be negatively related to the *transition* to coresidency.[30]

The coefficients on children's characteristics reinforce the story that coresidency is more a result of evolving household structure and children aging than an explicit form of old age support. The parent is significantly more likely to be living

[29] 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.

[30] Their study covered a 4 year period. We tried including a quadratic in age but it was insignificant.

with unmarried children (who are less likely to have moved out of the parental home) than married children.

The only indication that coresidency may respond to parental need is that the parent is more likely to coreside if s/he has more, better educated children. This may indicate that coresidence is responsive to children's income and that more educated children are better able to afford having their parents live with them.[31]

Importantly for the identification of the switching regressions, average house price in the parent's locality is strongly significant (at the one percent level) and it has the expected positive sign. Living in a more expensive area increases the probability of coresidency. The average size of homes in the locality is not significant, however.

The only other significant determinant of coresidency is the sector of the economy in which the parent was employed 20 years ago. This variable is included in the coresidency equation because of its potential effect on labor supply and the need to include all of the variables in the system of equations in the coresidency equation. Parents who were self-employed 20 years ago are nine percentage points less likely to coreside. As shall be seen below, these people are also more likely to be working. It is not clear from this reduced form coresidency equation whether this effect is coming from this effect on parental labor supply or through some other avenue. 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. It was

[31] Note however that Cameron (2000) examined this issue directly and found no evidence that Indonesian parents tended to live with wealthier children.

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

Transfers to Indonesian Elderly from Non-Coresiding Children:

We next estimate the reduced form equation for the total amount of money transferred to parents from non-coresiding children, using the estimated results from the coresidency equation to switch between equations (14) and (16).[32] Specifically,

$$E(\sum TR) = \Phi(Z\hat{\eta}) * Q_i^* \pi_C + (1 - \Phi(Z\hat{\eta})) * Q\pi_N + \phi_i(X_i\hat{\eta})(u_1 - u_2) \qquad (19)$$

where Φ and ϕ are the standard normal cumulative distribution and probability density function respectively and $\hat{\eta}$ are the determinants of coresidency estimated from equation (18). The vector $Q_i = \{Z^P, Z^{NC}\}$ only includes the characteristics of parents and non-coresiding children. The vector $Q_i^* = \{Z^P, Z^{NC}, Z^{CC}\}$ includes the characteristics of parents, non-coresiding and coresiding children. Equation (19) was estimated using Tobit regression.[33] Coefficients were tested and those that did not differ significantly by coresidency status were constrained to be equal.[34] The marginal effects[35] and bootstrapped confidence intervals[36] from this restricted estimation are presented in Table 4.

---

[32] See Maddala (1983) page 223 for a discussion of switching regression models.

[33] 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 which 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.

[34] In effect we tested whether $\pi_C = \pi_N$.

[35] Rather than considering the coefficients from the above regression, we calculate the effect of a change in each independent variable (the marginal effects) taking the censoring into account (See

Table 4 here

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 do not seem to be related to parental need as measured by the elderly parent's own characteristics.[37] Disabled parents and parents with no or very little education do not receive any more in transfers than their able-bodied, better educated counterparts. Older parents actually receive less with transfers falling by approximately Rp 4,600 rupiah for each year the parent ages, though this effect is significant at only the ten percent level. Given the cross-sectional nature of our data, this pattern may reflect differences across birth-cohorts rather than the effects of aging *per se.* Finally, wealthier parents receive significantly more transfers from their non-coresiding children. This is the basis on which previous studies rejected altruism (Cox and Rank (1992) for example). Here though this effect (like that for age) is very small. Increasing asset levels by Rp 1,000,000 (18 percent of the mean asset level) results in transfers increasing by Rp 1,500 each year.

Transfers from non-coresiding Indonesian children to their elderly parents also appear to be only loosely related to the ability to give. While unmarried children (who most likely have fewer dependents) transfer on average Rp 123,600 more each year,

---

Green, 1997). Note that the continuous approximation was used in calculating the marginal effects for discrete independent variables.

[36] As our direct interest is in hypothesis tests about the marginal effects (rather than the coefficients themselves) we have boot strapped the confidence intervals for the marginal effects using data resampling (see Veal, 1998; Hamilton, 1992). Because the estimated bias was very small, we have chosen to present the confidence intervals calculated from the percentile-t method without correcting for the bias.

there is no significant relationship between children's education levels and the amount they transfer to their mothers and fathers. Non-coresiding children with a tertiary education do not transfer significantly more than children with no education, suggesting that there is little relationship between the earnings of children and their transfers to their parents.

Although transfers are in the main responsive to neither the characteristics of the non-coresiding children themselves nor the characteristics of their parents, they are strongly related to the characteristics of the coresiding siblings.[38] One possibility is that transfers are in fact related to parental need when the parent coresides, but that need is better captured by the characteristics of other household members than by the characteristics of parents themselves. Transfers from non-coresiding children to their coresiding parents increase as the overall number of coresiding siblings increase,[39] though the effect is somewhat larger for unmarried (Rp 263,500) than for married (Rp 192,500) siblings.

Non-coresiding children also transfer less when their coresiding siblings have some (as opposed to no) education. In particular, just over Rp 225,000 less is transferred each year when a coresiding sibling has either a primary or a secondary education as opposed to having no education at all. The number of coresiding children with tertiary education, controlling for the total number of coresiding children, is similarly negatively related to transfers received (although the effect is smaller in magnitude).

---

[37] Ravallion and Dearden (1988) model both the magnitude and direction of gross and net financial transfers and found that in both the rural and urban areas of Java private transfers between individuals were targeted towards the disadvantaged, including the elderly.

[38] Note that the characteristics of coresiding children are relevant only when parents coreside.

[39] To see this note that the effect of both married and non-married adult children in the coresiding household are positive and significant.

To the extent that parental need increases with household size and low education levels of coresiding children, these results suggest that for coresiding parents, transfers from non-coresiding children are based in some part on need. At the same time, it is puzzling that other, more direct measures of parental need—in particular parental asset levels or disability status—are not related to transfers. These findings are also consistent with norms of fairness and/or altruism across siblings. Providing a "fair" share of parental support may be an important determinant of transfers from children to parents.[40]

At the mean, coresiding parents in our sample are predicted to receive approximately Rp20,000 less in transfers than non-coresiding parents per year.

To some extent, the results above are consistent with 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 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. Any provision of old age support appeared to be targeted towards mothers, particularly those who are widowed or in ill health. At the same time, unlike Lillard and Willis (1997), our findings suggest that

[40] The only other significant variable in the regression is the effect of having children living in another province. This effect differs depending on the coresidency status of the parents. If the parents do not coreside and have a child who lives in another province, then they are likely to receive more transfers. If they live with one or more of the absent child's siblings, they are likely to receive less transfers. It is not clear what explains this pattern. Children may move to another province in search of more lucrative employment opportunities. They may then be more financially able to remit but may do so only if their parents are in real need which is more likely if the parents do not coreside.

the characteristics of coresident siblings are important determinants of transfers to parents.[41]

The Labor Supply of Indonesian Elderly:

To assess those factors related to the labor supply of elderly Indonesians, we estimate the endogenous switching regressions model of desired parental hours of work (LS^*) using the same two stage estimation method as above. Equation (18) provides the endogenous switch between equations (13) and (16). Specifically, we estimate

$$E(H^*) = \Phi(Z\hat{\eta}) * M_i^* \beta_A + (1 - \Phi(Z\hat{\eta})) * M_i \beta_W + \phi_i(X_i\hat{\eta})(\varepsilon_1 - \varepsilon_2). \qquad (20)$$

where $\Phi(\cdot)$ and $\phi(\cdot)$ are defined as before. Equation (20) is estimated separately for men and women because we expect the determinants of labor supply to vary with gender. Although we do not observe desired hours of work, we do observe the "normal" hours worked per week by the men and women in our sample. Thus, equation (20) was estimated using Tobit regression in order to take into account the non-negativity of the hours measure. As before, coefficients were tested and those that did not differ significantly by coresidency status were constrained to be equal. This restricted version of equation (20) was then first estimated assuming that financial transfers from children are exogenous. However as discussed above, there are theoretical reasons to believe that transfers may be endogenous to the labor supply decision so the model is re-estimated incorporating the predicted level of transfers

[41] Lillard and Willis (1997) also concluded that coresidency was exogenous to the transfer decision but that coresiding fathers were more likely to receive transfers than non-coresiding fathers. Coresidency

obtained from the estimation of equation (19). The results—marginal effects and bootstrapped standard errors—from both specifications are presented in Table 5 for women and Table 6 for men.

Tables 5 and 6 here

The Impact of Transfers on Labor Supply

The results show little evidence that financial transfers from Indonesian children are a substitute for the income support provided by the elderly parent's own labor supply. Before instrumenting, transfers are negatively and significantly related to normal weekly hours of work for females, but not for males. However, once we instrument for the endogeneity of transfers even this effect disappears. We used the test suggested by Davidson and MacKinnon (1993) to test the endogeneity of transfers in the female labor supply equation.[42] Endogeneity was rejected (p=0.93) which suggests that we should place more emphasis on the non-instrumented results. However, even this effect is small—doubling transfers leads to a 2.5 percent reduction in hours.[43]

The finding of exogeneity reinforces out previous conclusion that transfers from children do not seem to respond to parental need. Specifically, it suggests that children's transfers are not influenced by how many hours mothers must work to support themselves. The test of the endogeneity of transfers in the male labor supply equation also rejects endogeneity (p=0.13). We hence will focus our discussion on the non-instrumented results below. Note however that apart from transfers in the

---

did not affect the amount of transfers received by mothers.

[42] This involves including both the predicted values of transfers and the actual value of transfers in the labor supply equation. If the predicted value is significant in this regression then we conclude that transfers are endogenous.

women's equation, the coefficients differ only very slightly across the two sets of results for both males and females.[44]

Women's Labor Supply

The effects of many of the other explanatory variables on women's labor supply vary with coresidency status. The results are consistent with coresiding women having a greater ability to vary the hours they work. For instance, coresiding women's labor supply behavior decreases with age, while non-coresiding women's labor supply does not. There are also differences in the relationship between education and labor supply across coresiding and non-coresiding women. Coresiding women's hours of work increase with education whereas non-coresiding women's hours of work decrease. Non-coresiding women with no education at all are predicted to work more than 40 hours more per week than non-coresiding women with at least a secondary school education. As wage rates increase with the level of education, this suggests that it is the non-coresiding women facing the lowest returns to market work (but perhaps the greatest need) who continue to work into their old age. To the extent that higher education levels are reflected in higher wages, this indicates that for these groups the income effect of higher wages dominates the substitution effect. In contrast, women who live with one or more of their children in their old age work significantly more hours the more education they have indicating for them that the substitution effect dominates the income effect. By allowing them to reduce their hours of work,

[43] This elasticity was calculated by dividing the marginal effect of log transfers (-0.596) by mean hours of work which for women equaled 24.2.

[44] It should be noted that it is also possible that although our instruments for transfers (the characteristics of non-coresiding children) were jointly significant in the first stage regression, they were not strong enough predictors of transfer behavior to be completely successful in eliminating the bias associated with the endogeneity of transfers (Bound, Jaeger, and Baker, 1995). This would also make the Davidson and MacKinnon test more likely to reject endogeneity.

coresidency may provide an important form of support for elderly women with no or very low levels of education.

Like transfers, unearned income similarly appears to play little part in the labor supply decisions of elderly Indonesian females. Unearned income has an insignificant effect on the labor supply of women, regardless of coresidency status. The effect of pension income is however probably largely captured by the dummy variables that reflect previous work status. Very few individuals other than government officials receive pension income in Indonesia. Women who were government employees 20 years ago work significantly less than most other work categories (other than those who were not working at all 20 years ago). For example, coresiding women who were government officials 20 years ago work on average 16 hours a week less than women who were self-employed at that time and 5 hours less than private employees.

It might be expected that Indonesian women who have higher levels of assets would not need to work such long hours and so would work significantly less. This is true of coresiding women but for non-coresiding women assets have a somewhat perverse effect in that having more assets is correlated with working more. This effect is however very small and could be due to the endogeneity of assets. As noted above, although assets could potentially be endogenous, we elected to include them because they could theoretically be an important determinant of elderly labor supply and their inclusion was found not to effect the coefficients on the other variables.

Other characteristics that affect a woman's hours of work are marital status, although only for non-coresiding women, with married non-coresiding women working greater hours than single non-coresiding women. Having a disability

significantly reduces the hours worked regardless of coresidency by an average of 9 hours per week.[45]

It is difficult to interpret the relationship between coresidency and labor supply for women from just looking at Table 5. In large part it depends on the specific characteristics of the elderly woman. The model predicts that the non-coresiding women in the sample work approximately 4 hours more per week than the coresiding women in the sample. However, this masks larger differences in hours worked by coresidency for a given woman. For example, a single woman living in a rural area with no education, no disability and the mean value of assets, income and transfers for all women in the sample is predicted to work 15 hours a week if she lives alone but only 4 hours a week if she coresides.[46]

Men's Labor Supply

Male labor supply is found to be a lot less variable than female labor supply. Just as it is not responsive to transfers, it is not responsive to unearned income or assets.

It does however vary with the parent's own demographic characteristics. There is evidence that the labor-supply behavior of the elderly is related to their capacity to work. Normal hours decline about one hour per week with each year of age and disabled work more than 13 fewer hours per week. There is also a strong negative relationship between education and the hours that elderly Indonesian men work each

[45] The selectivity terms in the regression were insignificant. This is also true for men. This suggests that there are no significant differences in the way in which the unobserved heterogeneity associated with the coresidency decision affects the hours of work of coresiding and no coresiding men and women. We have no theoretical reasons to expect relative selectivity to either be positive or negative.

[46] For this calculation it was assumed that the coresiding child is single and with a primary school education. As suggested by the discussion above, the effect of coresidency differs if the woman is well-educated.

week. Men with only primary education and men with at least some secondary education work approximately 4.5 and 10.0 fewer hours respectively per week in their old age than men with no education at all. Higher wages are hence used to buy leisure (as was the case for non-coresiding women).

As was found for women, there is a significant relationship between the hours men work in old age and the sector of the Indonesian economy they were employed in 20 years earlier. Elderly Indonesian men who two decades ago were government employees work the same hours in their old age as those who were not employed at all (as was observed for women, although the effect is insignificant for non-coresiding women), whereas previous employment in the private sector and having been self-employed is related to a greater number of hours of work after age 60. In addition to reflecting both the availability of old-age pensions in each of these sectors (as discussed above) these variables also probably control for the opportunity for continued employment. Self-employed individuals for instance can continue to generate their own employment opportunities into their old age.

We might expect that rural/urban status would further capture both the opportunity for and returns to employment, yet for both men and women, once other factors are taken into account, the labor supply of elderly males and females were found not to differ significantly between rural and non-rural labor markets.

The relationship between coresidency and labor supply for men is different than what was discovered above for women. The average coresiding male is predicted to work slightly more than the average non-coresiding male (33 and 30 hours per week respectively). This may reflect the difficulty of defining coresidency. An elderly male who lives with children may actually be working to support the children. The

point estimates on coresiding children's characteristics, although not significant, suggest that the more married children the man has, the less he works.

This leads us to an unexpected result that hasn't been noted above. 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—is unrelated to the labor supply decision of the elderly parent. Controlling for the number of adult coresiding children (i.e., the number of married and non-married children), having children who are relatively better education (and therefore presumably have higher earnings) does not result in their elderly parents working less.[47]

6. Conclusions:

This paper considers the determinants of the labor supply of Indonesian elderly allowing labor supply to be simultaneously determined along with coresidency and the receipt of transfers. Our goals were to: 1) examine the quantitative importance of each of these three forms 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 support appear to be prevalent and quantitatively important. We however find that 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 are primarily a function of the characteristics of their coresiding siblings. Transfers do not seem to be strongly related to parental need as measured by the parent's own characteristics. Nor do transfers appear to be strongly related to the ability to give as measured by non-coresiding children's characteristics. This may be consistent with attempts to ensure fairness or sharing across siblings.

In general, the labor supply behavior of Indonesia elderly is not sensitive to other forms of income support, specifically coresidence or financial transfers. The exception is elderly Indonesian women with no or very little education for whom coresidency may act as an important form of support by allowing them to reduce their hours of work. At the same time, the labor supply of coresiding elderly parents is unrelated to the characteristics of their coresiding children. This is particularly striking since it seems to suggest that overall household resources—as reflected in the numbers of adult children and their education levels—is unrelated to the labor supply decision of the elderly parent.

We can only speculate about why the labor supply of elderly Indonesians does not appear more responsive to the support provided in the form of transfers or through coresidency. One possibility, is that the value of this support is not large enough—or may be too unpredictable—to play an important role in an elderly person's labor supply decision. Alternatively, there may be either cultural or emotional motivations for continuing to work into old age.

[47] We also specified the hours equation including interactions for children's marital status and gender. We found no significant differences in the effect of sons and daughters however, so these interactions were dropped from the regressions.

REFERENCES

Adlakha, A. and D. Rudolph (1994) "Aging Trends: Indonesia", *Journal of Cross-Cultural Gerontology*, 9, pp99-108.

Altonji, J., F. Hayashi and L. Kotlikoff (1994), "Parental Altruism and Inter Vivos Transfers: Theory and Evidence", unpublished paper, pp.1-56.

Becker, G. (1974), "A Theory of Social Interactions", *Journal of Political Economy*, 82(6), pp1063-93.

Becker, G. (1993), *A Treatise on the Family*, Cambridge, MA: Harvard University Press.

Bernheim, D., Shleifer, A. and L. Summers (1985), "The Strategic Bequest Motive", *Journal of Political Economy*, 93, pp 1045-1076.

Bound, J., D.A. Jaeger, and R.M. Baker (1997). "Problems with Instrumental Variables Estimation When the Correlation Between the Instruments and the Endogenous Explanatory Variable is Weak", *Journal of the American Statistical Association*, 90(430), pp 443-450.

Cain, M. (1991), "The Activities of the Elderly in Rural Bangladesh", *Population Studies*, 45, pp189-202.

Cameron, L. (2000), "The Residency Decision of Elderly Indonesians: A Nested Logit Analysis", *Demography*.

Cox, D. and E. Jimenez (1992), "Social Security and Private Transfers in Developing countries: The Case of Peru", *World Bank Economic Review*, 6(1), pp155-169.

Cox, D. (1987), "Motives for Private Income Transfers", *Journal of Political Economy*, 95(3), pp 508-543.

DaVanzo, J. and A. Chan. 1994. "Living Arrangements of Older Malaysians: Who Coresides with Their Children?" *Demography* 31(1):95-113.

Davidson, R. and J. MacKinnon (1993), *Estimation and Inference in Econometrics*. Oxford University Press, New York.

Deaton, A. and C. Paxson (1995), "Measuring Poverty among the Elderly", Working Paper, Research Program in Development studies, Princeton University.

Engers, M. and S. Stern (1998), "Long Term Care and Family Bargaining", Working Paper, University of Virginia, pp1-67.

Evans, J. 1990. "The Economic Status of Older Men and Women in the Javanese Household and the Influence of this upon their Nutritional Level." *Journal of Cross-Cultural Gerontology* 5:217-242.

Frankenburg, E., Beard, V. and M. Saputra (1999), "The Kindred Spirit: The Ties that Bind Indonesian Children and their Parents", *Southeast Asian Journal of Social Science*, 27(2), pp65-86.

Hanoch, G. and M. Honig (1983), "Retirement, Wages, and Labor Supply of the Elderly", *Journal of Labor Economics*, 1(2), pp131-151.

Hiedemann, B. and S. Stern (1998), "Strategic Play Among Family Members when Making Long-Term Care Decisions", Working Paper, University of Virginia, June, pp1-41.

Hoddinott, J. (1992), "Rotten Kids or Manipulative Parents: Are Children Old Age Security in Western Kenya?", *Economic Development and Cultural Change*, 40, pp545-566.

Hoerger, T., Picone, G. and F. Sloan (1996), "Public Subsidies, Private Provision of Care and Living Arrangements of the Elderly", *Review of Economics and Statistics*, pp428-440.

Jensen, R. (1996), "Public Transfers and Migrant Remittances: Theory and Evidence from South Africa", unpublished paper, pp1-35.

Kim, I. and E. Choe. 1992. "Support Exchange Patterns of the Elderly in the Republic of China." *Asia-Pacific Population Journal* 7(3):89-104.

Khemani, S. (1999), "Inter-generational Transfers and Intra-household bargaining: evidence from Indonesia", unpublished paper, pp1-44.

Kochar, A. (1997), "Evaluating Familial Support for the Elderly: The Intra-Household Allocation of Medical Expenditures in Rural Pakistan", unpublished paper.

Lillard, L. and R. Willis (1997), "Motives for Intergenerational Transfers: Evidence from Malaysia", *Demography*, 34(1), pp 115-134.

Maddala, G.S. 1983. *Limited Dependent and Qualitative Variables in Econometrics*. Econometric Society Monograph No. 3. Cambridge, U.K.: Cambridge University Press.

Martin, L. 1988. "The Aging of Asia." *Journal of Gerontology* 43:S99-113.

Martin, L. 1989. "Living Arrangements of the Elderly in Fiji, Korea, Malaysia and the Philippines." *Demography* 26:627-44.

McGarry, K. and R. Schoeni (1995), "Transfer Behavior in the Health and retirement Study: Measurement and the Redistribution of Resources within the Family", *Journal of Human Resources*, XXX, pp. S186-S226.

Niehof, A. (1995), "Ageing and the Elderly in Indonesia: Identifying the Key Issues",

Pezzin, L. and B. Schone (1996), "Intergenerational Transfers of Time and Elderly Living Arrangements: A Bargaining Model of Family Resource Allocation Decisions", unpublished paper.

Pezzin, L. and B. Schone (1997), "The Allocation of Resources in Intergenerational Households: Adult Children and Their Elderly Parents", *American Economic Review*, AEA Papers and Proceedings, 87(2), pp460-464.

Ravallion, M. and L. Dearden (1988), "Social Security in a 'Moral Economy': An Empirical Analysis for Java", *Review of Economics and Statistics*, 70, 36-44.

Rosenzweig, M. and K. Wolpin (1993), "Intergenerational Support and the Life-Cycle Incomes of Young Men and Their Parents: Human Capital Investments, Coresidence, and Intergenerational Transfers", *Journal of Labor Economics*, 11(1), pp84-112.

Rudkin, L. 1994. "Dependency Status and Happiness with Old Age on Java." *The Gerontologist* 34(2):217-223.

Rudkin, L. 1993. "Gender Differences in Economic Well-Being Among the Elderly of Java." *Demography* 30(2):209-226.

Secondi, G. (1997), "Private Monetary Transfers in Rural China. Are Families Altruistic?", *Journal of Development Studies*, 33(4), pp487-511.

Wolf, D. and B. Soldo. 1988. "Household Composition Choices of Older Unmarried Women." *Demography* 25(3):387-403.

World Bank. 1995. *The World Development Report.* New York: A World Bank Publication, Oxford University Press.

Figure 1: Coresidency by Age

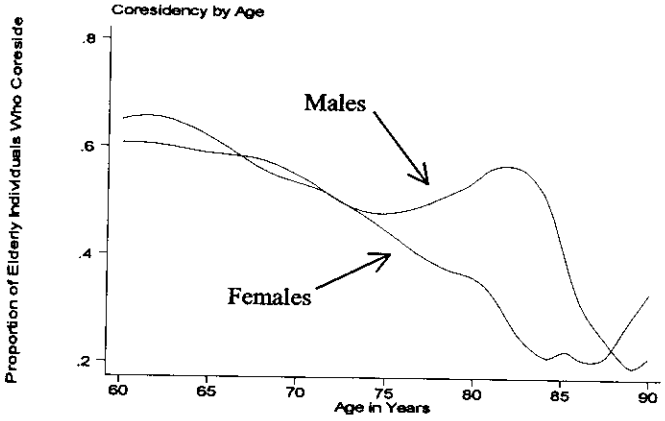


Figure 2: Transfers by Age

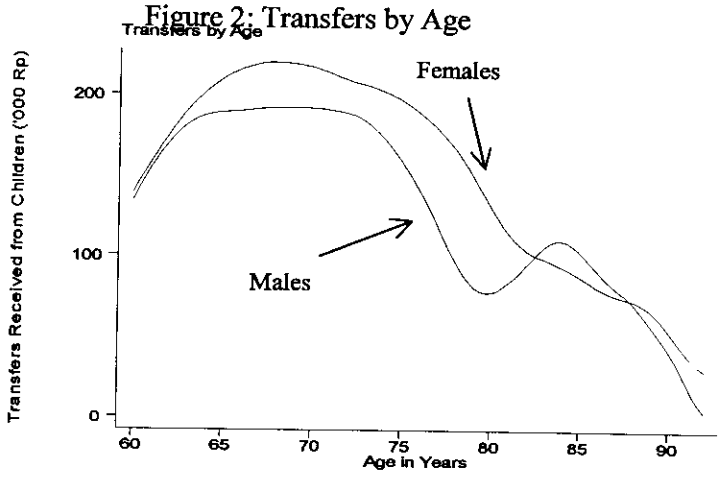


Figure 3: Labor Supply by Age and Gender

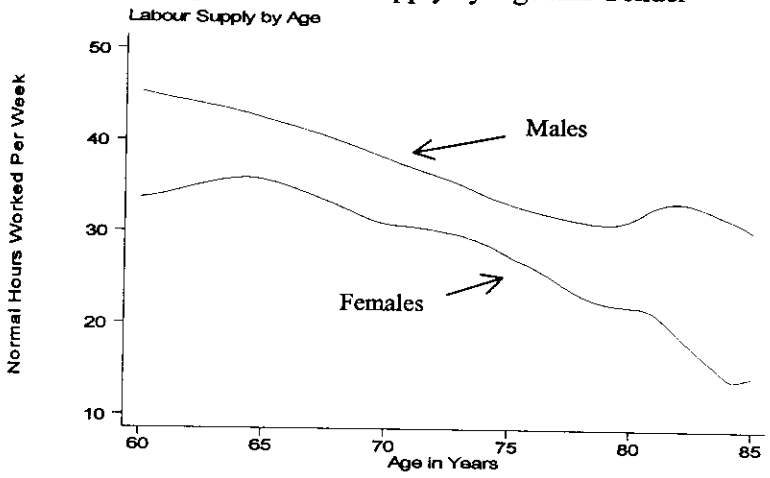


Table 1: Living Arrangements of the Indonesian Elderly

Living Arrangement (N=2625)	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 thousand)	224.4	158.5	168.3	174.9
Proportion Receiving Transfers (%)	72.3	51.5	62.6	56.6
Mean Transfers/Mean Household Income (%)	36.4	6.7	25.6	11.6
Mean Transfers/Mean Individual Income (%)	123.4	43.1	30.3	15.4
Mean Normal Weekly Hours Worked	17.6	13.5	34.1	23.6

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

	Marginal Effect	Standard Error
Parents Income		
Other Income ($Rp10^5$)	-0.011***	(0.001)
Assets ($Rp10^6$)	-0.0012	(0.004)
Parents Characteristics		
Age	-0.007***	(0.002)
Married	-0.012	(0.035)
Male	-0.005	(0.037)
Disabled	0.028	(0.051)
Primary Education	-0.024	(0.031)
Secondary/Tertiary Education	-0.039	(0.064)
Rural	-0.052	(0.034)
Previous Work Status		
Self-Employed	-0.093***	(0.034)
Government	0.002	(0.075)
Private	-0.051	(0.046)
Children's Characteristics		
Married	-0.032	(0.022)
Not Married	0.120***	(0.024)
Primary Education	0.038*	(0.021)
Secondary Education	0.057**	(0.023)
Tertiary Education	0.030	(0.024)
Local Housing Market		
Average House Price ($Rp10^6$)	0.011***	(0.001)
Average House Size	0.000	(0.000)
N=1464		

Table 4: Determinants of Transfers from Non-Coresiding Children
(Tobit Marginal Effects and Bootstrapped Five Percent Confidence Intervals[a])

	Marginal Effect	Five Percent Confidence Intervals	
Parental Income			
Other Income ($Rp10^5$)	2.780*	-0.342	6.000
Assets ($Rp10^6$)	1.480***	0.525	2.580
Parental Characteristics			
Age	-4.619*	-9.658	0.200
Primary	1.165	-60.180	64.963
Secondary/Tertiary	-42.872	-170.276	94.869
Married			
Coreside	29.001	-125.657	169.183
Non-Coreside	-215.823**	-399.035	-37.434
Male	-49.460	-119.875	20.574
Disabled	1.884	-103.677	112.901
Rural	-0.432	-75.591	72.724
Previous Employment Sector			
Self-Employment	-35.899	-106.719	37.258
Government	-66.402	-217.055	85.370
Private	-31.809	-125.439	55.300
Non-Coresiding Children's Characteristics			
Married	49.815	-12.487	109.7944
Not Married	123.562***	41.436	200.992
Primary	17.446	-37.695	80.000
Secondary	50.577	-8.952	118.6239
Tertiary	43.423	-15.375	113.850
Living Out of Province			
Coreside	-40.821*	-83.183	7.234
Non-Coreside	79.950**	2.652	147.417
Coresiding Children's Characteristics			
Married	192.458**	24.662	331.837
Not Married	263.515***	111.242	402.152
Primary	-228.943***	-359.189	-80.140
Secondary	-227.672***	-358.899	-83.571
Tertiary	-134.155**	-276.607	-13.041
Constants			
Coreside	-130.566	-524.016	296.874
Non-Coreside	367.202	-154.244	988.500
Selectivity	250.024	-366.325	793.928
N=1430			

[a] Note: Five percent confidence intervals are shown. One and ten percent confidence intervals were also calculated and the results are indicated as follows:

* Significant at 10%
** Significant at 5%
*** Significant at 1%

Table 5: Determinants of Weekly Normal Hours of Work for Indonesian Elderly Women (Tobit Marginal Effects and Bootstrapped Standard Errors)

	Non-Instrumented			Instrumented		
	Marginal Effects	Five Percent Confidence Interval		Marginal Effects	Five Percent Confidence Interval	
Parent's Income						
Transfers from Kids ($Rp10^4$)	-0.596**	-1.230	-0.033	-0.404	-1.837	0.860
Other Income ($Rp10^5$)	0.097	-0.147	0.421	0.078	-0.217	0.407
Assets($Rp10^6$)						
Coreside	-0.589*	-1.252	0.059	-0.607*	-1.244	0.065
Non-Coreside	1.058**	0.135	1.952	1.079**	0.142	1.983
Parent's Characteristics						
Age						
Coreside	-1.309***	-1.994	-0.467	-1.329***	-2.045	-0.501
Non-Coreside	0.075	-0.621	0.747	0.047	-0.638	0.735
Primary Education[a]						
Coreside	8.748**	0.306	16.949	8.452*	-0.218	16.923
Non-Coreside	-10.237*	-19.538	0.322	-10.195*	-20.273	0.403
Secondary/Tertiary Education[a]						
Coreside	23.710*	-4.266	39.951	23.452*	-3.902	39.032
Non-Coreside	-40.650**	-74.773	-5.403	-41.888**	-76.323	-8.170
Married						
Coreside	-4.805	-12.539	3.015	-4.758	-12.537	3.012
Non-Coreside	11.272**	1.532	20.039	11.492**	1.320	20.777
Disabled	-8.908***	-15.705	-3.278	-8.880***	-15.689	-3.270
Rural	1.459	-2.042	4.771	1.319	-2.180	4.730
Previous Work Status[b]						
Self-Employed						
Coreside	26.701***	18.137	34.321	27.061***	18.662	34.624
Non-Coreside	1.315	-8.390	12.393	0.854	-8.757	12.258
Government	10.500	-10.568	23.109	10.069	-11.694	23.071
Private	15.265***	10.701	20.175	15.445***	10.655	20.337
Coresiding Children's Characteristics						
Married	0.346	-13.185	9.841	0.075	-13.277	9.471
Not Married	2.475	-11.163	12.345	2.011	-11.505	11.841
Primary Ed.	-3.527	-13.080	10.111	-3.090	-12.820	10.476
Secondary	-6.190	-16.576	6.644	-5.723	-16.167	6.791
Tertiary Ed.	-3.152	-10.485	5.090	-2.732	-10.184	5.700
Constant						
Coreside	81.522***	25.543	129.775	82.641***	26.441	132.341
Non-Coreside	-11.667	-73.874	52.163	-9.296	-71.194	52.707
Selectivity	-9.654	-40.925	27.784	-10.750	-41.958	27.381
N	713			713		

[a] Relative to no education.
[b] Work status 20 years ago. The omitted category is not at work.
* Significant at 10%
** Significant at 5%
*** Significant at 1%

Table 6: Determinants of Weekly Normal Hours of Work for Indonesian Elderly Men
(Tobit Marginal Effects and Bootstrapped Standard Errors)

	Non-Instrumented			Instrumented		
	Marginal Effects	Five Percent Confidence Interval		Marginal Effects	Five Percent Confidence Interval	
Parent's Income						
Transfers from Kids ($Rp10^4$)	0.076	-0.677	0.848	-1.292	-3.359	0.957
Other Income ($Rp10^5$)	-0.045	-0.490	0.362	0.068	-0.392	0.494
Assets($Rp10^6$)						
Coreside	-0.601	-1.666	0.562	-0.531	-1.619	0.610
Non-Coreside	1.103	-0.604	2.713	1.163	-0.579	2.806
Parent's Characteristics						
Age	-1.384***	-1.727	-1.065	-1.350***	-1.693	-1.011
Primary Education[a]	-4.652**	-8.496	-0.615	-4.451**	-8.558	-0.421
Secondary/Tertiary Educ.[a]	-10.190**	-18.216	-2.281	-9.927**	-18.221	-1.711
Married	6.452**	0.258	13.766	5.988**	-0.380	13.254
Disabled	-13.224***	-23.566	-3.616	-13.418***	-24.017	-3.564
Rural						
Coreside	-1.529	-13.956	10.850	-1.193	-13.482	10.970
Non-Coreside	13.898	-5.564	34.278	14.824	-4.858	34.577
Previous Work Status[b]						
Self-Employed	16.517***	10.372	22.254	16.848***	10.615	22.574
Government	-4.181	-14.327	4.921	-4.255	-14.566	5.058
Private	11.664***	4.596	18.371	11.587***	4.379	18.372
Coresiding Children's Characteristics:						
Married	-7.623	-24.671	6.941	-5.822	-23.065	8.491
Not Married	-4.198	-19.777	8.079	-3.094	-19.173	9.312
Primary Ed.	2.665	-10.071	18.343	0.369	-12.336	16.733
Secondary	2.012	-11.184	18.031	-0.206	-13.536	16.073
Tertiary Ed.	-2.655	-17.528	7.875	-4.042	-19.727	6.906
Constant						
Coreside	114.403***	90.985	148.380	117.182***	83.739	152.582
Non-Coreside	51.372	-12.944	114.960	49.070*	-14.734	114.195
Selectivity	18.217	-24.984	57.847	14.575	-29.642	54.659
N	717			717		

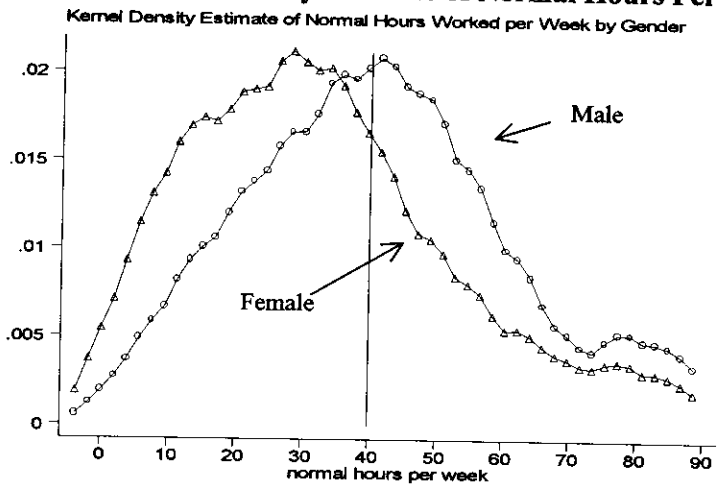
[a] Relative to no education.
[b] Work status 20 years ago. The omitted category is not at work.
* Significant at 10%
** Significant at 5%
*** Significant at 1%

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

	Women		Men	
	Non-Coresiding	Coresiding	Non-Coresiding	Coresiding
Parental Income/Wealth				
Other Income($Rp10^5$)	Rp1.311	Rp1.641	Rp1.398	Rp2.833
Assets($Rp10^6$)	Rp3.923	Rp5.318	Rp3.696	Rp7.909
Parent's Characteristics[a]				
Age (years)	67.3	65.1	66.9	66.0
Primary	0.23	0.26	0.55	0.54
Secondary/Tertiary	0.05	0.04	0.07	0.13
Married	0.40	0.46	0.91	0.92
Disabled	0.09	0.10	0.05	0.05
Rural	0.65	0.54	0.74	0.59
Previous Employment Sector[a]				
Self-Employed	0.41	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
Non-Coresiding Children's Characteristics[b]				
Married	3.2	2.6	2.9	2.6
Not Married	0.4	0.3	0.5	0.3
Primary Education	2.5	1.6	2.3	1.6
Secondary Education	0.9	1.1	1.0	1.1
Tertiary Education	0.2	0.2	0.2	0.2
Out of Province	0.9	0.7	0.9	0.7
Coresiding Children's Characteristics[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
Local Housing Market				
Average House Price($Rp10^6$)	Rp8.208	Rp13.300	Rp6.146	Rp14.100
Average House Size (sqm)	73.1	81.1	76.4	83.4
N	292	421	305	412

[a] Unless otherwise specified, these are dummy variables.
[b] Numbers of children in each category.

Figure A1: Kernel Density Estimate of Normal Hours Per Week



2 Ufens up , bc
Uc , bc