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# Old-age labour supply in the developing world

LISA A. CAMERON\* and DEBORAH A. COBB-CLARK{

Department of Economics, University of Melbourne, Vic 3010 Australia and  
{Social Policy Evaluation, Analysis and Research Centre and Economics Program,  
Research School of Social Sciences, Australian National University, ACT 0200  
Australia.

E-mail: dcclark@coombs.anu.edu.au

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Rapid population ageing is becoming an increasingly important policy issue in many developing countries. Without broad-based pension

rst study of which one is aware

that jointly estimates the determinants of financial transfers from children and elderly labour supply in a developing country context. It is found that many Indonesians continue to work well into old age and there is little evidence that financial transfers are a substitute for the income generated by elderly parents' own labour supply.

## I. INTRODUCTION

The rapidly ageing populations of industrialized nations have received a lot of attention recently. However, it is much less widely known that the populations of many developing countries are also ageing. The consequences of population ageing in developing nations are likely to be just as serious but may present very different policy challenges. For example, the virtual absence of established pension schemes implies that most elderly individuals must depend on their own labour market income and support from children as their primary means of old-age support. Continued reliance on support from children may become particularly strained as elderly dependency ratios increase.

Despite a growing interest in the welfare of the elderly in developing countries, little has been written about the elderly's labour-supply decisions. Labour-supply behaviour is likely to be jointly determined with other major forms of old-age support ± specifically, financial transfers from children. This paper is unique in accounting for this simultaneity in the estimation of the labour-supply model. There is particular interest in examining whether elderly labour supply responds to financial support from children.<sup>1</sup>

Indonesia provides an interesting case study for addressing this issue. Indonesia has the third largest elderly population in the world and the number of elderly Indonesians is projected to increase by 400% between 1990 and 2025 (Adlakha and Rudolph, 1994). At the same time, public and private pensions are virtually unknown outside the government sector leaving financial support from families and own market income as the primary means of old-age support. There is no 'Indonesian norm' of support for the elderly, however, and patterns of support differ across different ethnic groups (Beard and Kunharibowo, 2001).

## II. THE INDONESIAN FAMILY LIFE SURVEY

The 1993 Indonesian Family Life Survey (IFLS) is analysed.<sup>2</sup> The IFLS provides data from a random sample of 7224 households across Indonesia. The sample consists of the 1507 individuals in these households who are over the age of 60, report having at least one living child over the age of 18 and who were able to answer the survey questions

Table 1. Mean transfers, proportion receiving transfers, and hours of work by coresidency status and gender

	Women		Men	
	Co-reside No	Yes	Co-reside No	Yes
Mean annual transfers (Rp 103)	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

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

themselves.<sup>3</sup> Dropping observations with missing values results in a final estimation sample size of 1429.

The IFLS is unusual in that in addition to detailed information about elderly parents it also provides demographic data for all living co-residing and non-co-residing children and information on financial transfers from non-co-residing children to parents in the past 12 months. It is this detail which provides the exclusion restrictions necessary to identify the model.

The IFLS data indicate that transfers from Indonesian children to their elderly parents are common with more than one in two elderly parents receiving a positive transfer in the previous year (see Table 1). Although the sums of money transferred are not very large (on average the equivalent of US\$71), they represent a large share of mean household income and an even larger share of mean personal income.

Table 1 also confirms that many Indonesian men and women remain economically active into their old age. Men who do not live with one or more of their children work an average of 34.0 hours each week, while co-residing men work a little less (30.3 hours). Indonesian women work approximately half the hours worked by men. Of all the individuals aged over 60 in the complete IFLS sample, 62.51% co-reside.<sup>4</sup>

### III. THE LABOUR SUPPLY OF INDONESIAN ELDERLY

Desired hours of work by elderly parents ( $H_i^*$ ) and desired transfers from children ( $TR_i^*$ ) are modelled in the following way:

$$H_i^* = \beta_1 X_i^1 + \beta_2 TR_i + v_i \quad (1)$$

$$TR_i^* = \gamma X_i^2 + \varepsilon_i \quad (2)$$

where both  $X_i^1$  and  $X_i^2$  contain variables reflecting parents' and co-residing children's characteristics. Non-co-residing children's characteristics also appear in  $X_i^2$  but not in  $X_i^1$ . Thus, the hours worked equation is identified by the exclusion of non-co-residing children's characteristics. This seems sensible as it implies that while non-co-residing children affect the labour supply of their parents via their provision of financial support, having taken that into account, their other characteristics are irrelevant to their parents' labour-supply decisions.<sup>5</sup> Although desired transfers and hours of work are not observed, Equations 1 and 2 are estimated jointly by maximum likelihood using data on actual transfers and the normal hours worked each week with the censoring taken into account. The determinants of labour supply are allowed to vary with gender and there is also a condition on co-residence status. Given space constraints, the discussion is focused on the estimated determinants of labour supply.

The results provide little support for the notion that financial transfers from Indonesian children are in general a substitute for the income provided by elderly parents' own labour supply (see Table 2). Transfers only have a statistically significant impact on labour supply for non-co-residing women and this effect is moderate in size  $\pm$  increasing transfers by Rp100,000 reduces weekly labour supply on average by 1.6 hours.

Like transfers, higher asset levels and unearned income do not alleviate the need to work. This is a surprising result. For co-residing women, unearned income is in fact associated with a small, but significant, increase in the

<sup>3</sup>Data on financial transfers are only available for those individuals able to respond for themselves leading especially frail or disabled individuals to be under-represented.

<sup>4</sup>Defined as living with a child who is aged over 18 years.

<sup>5</sup>The instruments were jointly significant at the 5% level in each case.

Table 2. Determinants of weekly normal hours of work for Indonesian elderly (marginal effects and t-statistics)

	Co-reside Women		Non-Co-reside Women		Co-reside Men		Non-Co-reside Men	
Parental resources								
Transfers (Rp10 <sup>4</sup> )	-0.02	(-0.44)	-0.16	(-2.36)	-0.03	(-0.41)	-0.01	(-0.12)
Other Inc. (Rp10 <sup>6</sup> )	2.06	(2.04)	0.78	(0.36)	-0.13	(-0.13)	0.38	(0.19)
Assets (Rp10 <sup>6</sup> )	0.00	(0.10)	-0.01	(-0.11)	0.04	(1.06)	-0.05	(-0.59)
Parental characteristics								
Age	-0.69	(-3.89)	-0.45	(-2.23)	-1.36	(-5.84)	-1.62	(-6.85)
Education <sup>a</sup> :								
Primary	0.74	(0.36)	2.29	(0.79)	-4.40	(-1.52)	-5.43	(-1.78)
Secondary +	5.69	(1.34)	-17.65	(-2.30)	-8.14	(-1.61)	-11.28	(-1.87)
Married <sup>b</sup>	3.64	(2.10)	-0.93	(-0.35)	5.22	(1.12)	8.15	(1.62)
Disabled	-7.94	(-2.46)	-13.54	(-2.65)	-20.35	(-3.14)	-6.12	(-1.01)
Rural	-0.01	(-0.01)	6.02	(2.15)	5.06	(1.78)	-0.73	(-0.22)
Previous work status <sup>c</sup>								
Self-employed	18.07	(9.29)	14.40	(5.39)	13.77	(3.49)	18.71	(3.70)
Government	3.62	(0.48)	23.25	(1.91)	-6.82	(-1.16)	-3.75	(-0.48)
Private	13.13	(4.54)	20.11	(4.84)	11.18	(2.60)	12.44	(2.22)
Co-residing children <sup>d</sup>								
Married	0.49	(0.26)			-0.96	(-0.37)		
Not married	0.44	(0.31)			0.011	(0.01)		
Secondary education	-2.35	(-1.70)			-0.38	(-0.21)		
Tertiary education	0.93	(-0.36)			-6.01	(-1.79)		
Constant	32.98	(2.73)	34.34	2.50	95.92	(5.29)	122.32	(6.57)
$\rho$	-0.00	(-0.00)	0.25	(1.30)	0.09	(0.66)	0.08	(0.42)
N	418		302		407		302	

Notes: <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. Omitted category is children with primary or less education.

hours worked each week. While other income includes pension income, the receipt of pension income may, in fact, be largely captured by previous work status.<sup>6</sup> Very few individuals other than government officials receive pension income in Indonesia and both men and women who were government employees 20 years ago work significantly less in old age than individuals previously employed in other sectors of the labour market. For example, co-residing women who were government officials 20 years ago work on average 14.5 hours per week less than women who were self-employed and 9.5 hours less than private employees.

The previous labour market sector may also control for the opportunity for continued employment. Self-employed individuals for instance may be able to continue to generate their own employment opportunities into their old age, while individuals not previously employed and those employed by the government may have very limited labour market opportunities.

The results further suggest that among non-co-residing men and women it is those individuals facing the lowest

returns to market work (but perhaps the greatest need) who continue to work into their old age. Hours of work of non-co-residing men and women decrease with education. Specifically, non-co-residing men with no education at all are predicted to work 11.3 hours more per week than non-co-residing men with at least a secondary school education. Among non-co-residing women the difference is even larger (17.7 hours). This is not the case for co-residing parents. It seems there may be two discrete categories of non-co-residing parent – the lowly educated who are dependent on their labour market earnings and the well-educated who largely get by without working.

There is some evidence that labour supply is related to the capacity for market work. In particular, normal hours of work decrease with each year of age and disabled individuals work substantially less.<sup>7</sup> Finally, co-residing parents appear to benefit more from living with better educated children. For example, men who live with a tertiary educated child work on average six hours less than those who live with a primary or lower educated child.<sup>8</sup>

<sup>6</sup> Unearned income is the sum of pension income, asset income and any other non-labour income not including transfer income. Assets include houses/buildings, land, animals, vehicles, appliances, savings, stocks, receivables, jewellery and any other assets. Transfers are calculated as the sum of transfers received from all non-co-residing children in the 12 months prior to the survey.

<sup>7</sup> Individuals are classified as disabled if they report having difficulty standing from sitting, dressing or going to the bathroom by themselves.

<sup>8</sup> Significant at the 10% level. Children's gender was initially interacted with education but these interactions were not significant.

#### IV. CONCLUSIONS

This paper considers the determinants of the labour supply of Indonesian elderly, allowing labour supply to be simultaneously determined with the receipt of transfers. The results suggest that the labour-supply behaviour of the Indonesian elderly is largely unaffected by financial transfers from their children.

In recent years the migration of many young Indonesians to the cities in search of work has resulted in a decline in co-residency and a likely greater reliance on financial transfers from children. The lack of responsiveness of labour supply to financial transfers found here suggests that this will increase the pressure on the elderly to continue working into old-age. We can only speculate as to why the labour supply of elderly Indonesians does not appear more responsive to the support provided in the form of transfers from children. 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

labour-supply decision. The welfare consequences of these changes are worthy of further research and policy attention.

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