Poverty, Household Size and Female Headed Households in India

J.V. Meenakshi
Delhi School of Economics
Delhi University
Delhi – 110007
INDIA

Ranjan Ray
School of Economics
University of Tasmania
GPO Box 252-85
HOBART AUSTRALIA

Abstract

This study utilises micro data on consumption, family composition and household headship to analyse poverty in India. The paper examines the impact of allowing economies of household size and adult/child relativities in consumption in modelling equivalence scales on the poverty calculations. A method of demographic adjustment of the poverty line to incorporate household size and composition is proposed and applied. The results show that, while the introduction of size economies in consumption leads to a sharp fall in the household poverty rates for the population as a whole, the exact reverse is indicated for the female headed households. In the presence of size economies, such households constitute one of the poorest subgroups in rural India.

1. INTRODUCTION

Poverty studies on India have tended to ignore the question of economies of household size in consumption [see, for example, Dreze and Srinivasan (1996), Dubey and Gangopadhyay (1998)]. Traditional analyses of poverty and welfare are conducted on a per capita basis, wherein households whose per capita incomes fall below a pre specified norm are identified as being poor. This approach ignores the presence of economies of household size since household members cooperate with each other and thereby get more out of their household incomes than would be possible if members operated as individual households. Another objection to the use of family size as the expenditure deflator is based on the non identical needs between the different members of the household, most notably, between adults and children.

This paper investigates the impact of allowing both household size economies and non identical consumption needs between adults and children on the poverty estimates. The study is based on the rich household level information on expenditures in rural India contained in the unit records, made available recently by the National Sample Survey Organisation. The empirical investigation is carried out with special reference to female headed households.

As we report later, the incorporation of household size economies and adult/child relativities has a special and rather dramatic impact on the poverty estimates of such households.

The remainder of this paper is as follows. Section 2 describes the poverty line adjustments needed to incorporate the estimated economies of household size and the adult/child relativities. The data is described in Section 3. The results are presented and discussed in Section 4. The paper ends on the concluding note of Section 5.

2. METHODOLOGY

2.1 Size Economies and Equivalence Scales

Most of the international poverty studies [see Buhmann, et al. (1988)] assume a common functional form for the equivalence scale, namely, N^θ, where N is the unweighted number of members in the household. The parameter θ is, therefore, relied upon to pick up not only the economies of household size but, also, changes in family composition between adults and children. The present study explicitly introduces household compositional variables in the equivalence scale specification by using N^+ as the expenditure deflator, where

$N^* = (n_a + \rho n_c)^\theta$. n_a, n_c denote the number of adults, children, respectively, in the household, and θ and ρ are the demographic parameters.

The estimates of θ and ρ, used here, were obtained in our earlier study [see Meenakshi and Ray (1999b)] which investigated a wider set of issues, than considered here, in the context of poverty in rural India. It is worth reporting here that, consistent with the evidence presented in Meenakshi and Ray (1999a), the estimates of θ and ρ vary widely between the constituent States of the Indian Union, and that the restrictions $\theta = 1$, $\rho = 1$ were individually and jointly rejected in each State.

2.2 Poverty Line Adjustments for Family Size and Composition

Using the estimates of θ, ρ for each State, the demographically adjusted poverty lines were obtained as follows. Following Dreze and Srinivasan (1997, p.225), the State specific poverty lines, taking account of household size economies and adult/child relativities, were obtained by multiplying the per capita official poverty line (OPL) figures reported in Dubey and Gangopadhyay (1998) by $(\bar{n}_a + \rho \bar{n}_c)^{1-\theta}$, where $\bar{n}_a$ is the average number of adults, and $\bar{n}_c$ is the average number of children in the State sample. Within the framework set by the official poverty line, we obtain two versions of this line, namely, (a) OPL1 when ρ, θ take on their estimated values and (b) OPL2 in the per capita case $(\rho = \theta = 1)$ that is conventionally used. Let us define scale and composition adjusted per capita expenditure (say y^*) for a household with n_a adults and n_c children as:

$$y^* = Y \Big/ (n_a + \rho n_c)^\theta \qquad (1)$$

where Y is total household expenditure, and ρ, θ are the demographic parameters as explained before. A household of size $n(= n_a + n_c)$ is then considered 'poor' if y^* falls below $OPL^* = OPL(\bar{n}_a + \rho \bar{n}_c)^{1-\theta}$ where $\bar{n}_a$, $\bar{n}_c$ are as explained before.

3. DATA AND ITS PRINCIPAL FEATURES

The data base for this study is provided by the unit record data on consumer expenditure in the rural areas collected for each of the States in India in the 50th round of the National Sample Survey (1993/94). The following 11 commodity expenditure classification was used in estimating the economies of household size and the adult equivalence scale parameters: Cereals and Cereal Substitutes; Pulses and Pulse Products; Milk and Milk Products; Meat, Eggs and Fish; Edible Oils; Vegetables and Fruits; Sugar and Gur; Other Food; Clothing and Footwear; Fuel and Light; Other Non Food.

For rural India as a whole, 68102 households were surveyed in 1993/94. The present study uses the original micro data from this survey. Following Meenakshi and Ray (1999 a,b), the analysis is carried out separately for each State. The sample size varies from State to State; while the number of observations for the smaller States is less than 500, those for the larger States is over 5000. In per capita terms, the FHH enjoy, in most States, higher aggregate expenditure than the others. However, this picture changes drastically in the presence of economies of scale of household size.

4. RESULTS

Table 1 provides evidence on the sensitivity of the headcount measures of household poverty to the alternative demographic adjustments of OPL, namely, OPL1, OPL2 described earlier. The table, also, reports for the female headed households as a separate subgroup, the corresponding head count poverty estimates. The following conclusions follow:

(i) Comparing the poverty estimates between those based on OPL1 and OPL2, we find that at the level of 'All Households', the introduction of economies of household size and non identical consumption needs between adults and children leads to a sharp reduction in the estimate of household poverty.

(ii) In sharp contrast to the other groups, the poverty rates of the female headed households (FHH) generally increase with the introduction of size economies and scale relativities between adults and children, ie. when we move from OPL2 to OPL1. FHH are generally smaller in household size and older in average age compared to the others and, hence, less able to take advantage of size economies in consumption, and of the lower consumption needs of the child in relation to the adult. This is confirmed visually by Figure 1 which presents the picture on poverty, using poverty lines OPL1, OPL2

in six of the larger States in India. This figure also presents the picture on poverty of the 'scheduled castes/scheduled tribes' (SC/ST), ie. the backward classes, for ready comparison. In Andhra Pradesh and Madhya Pradesh, for example, the introduction of size economies of consumption and of scale relativities between adults and children makes the FHH, under OPL1, one of the poorest subgroups in these States.

(iii) Figure 2, which presents the picture on poverty in these six States by the size of landholdings, confirms that the household poverty rates do fall with the introduction of size economies and an increase in the size of landholdings. It is noticeable, however, that there are some poor households among those with "large land holdings". It will be useful to analyse the characteristics of such households in future research.

5. SUMMARY AND CONCLUSION

This paper exploits the rich information form the 50th round of the National Sample Survey of household expenditure in rural India conducted in 1993/94 and recently made available in its original unit record form. This paper forms a small part of a much wider study [Meenakshi and Ray (1999b)]on the impact of demographic and socio economic variables on rural poverty in India.

The study initially tests for the presence of significant consumption economies of household size and of non identical consumption needs between adults and children. Nearly all the Indian States confirm the simultaneous presence of these demographic effects. The results argue against the conventional use of unadjusted household size as the expenditure or income deflator in the poverty calculations. They also suggest that the household size economies parameter cannot be relied upon to satisfactorily pick up household composition effects as well. The head count poverty rates fall, quite sharply in many cases, with the introduction of the State specific consumption economies of household size and of adult/child relativities in the equivalence scale used as the expenditure deflator. A significant exception is provided by the experience of the female headed households for whom the poverty rates move in exactly the opposite direction, ie. rise in the presence of size economies, reflecting their inability to take advantage of the demographic adjustments

because of their smaller size, and the smaller number of children in these households. The international literature contains considerable evidence to suggest that FHH are poorer than others (see, for example, Buvinic and Gupta (1997)'s evidence on Chile). The Indian evidence suggests, however, that this result is only valid in the presence of economies of household size and adult/child relativities.

6. REFERENCES

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Table 1: Estimates of poverty in rural India

State	Head Count Poverty Rate (% age)[a]			
	All Households		Female Headed Households	
	OLP1	OLP2	OLP1	OLP2
1. Andhra Pradesh	13.9	23.4	37.1	23.1
2. Arunachal Pradesh	29.9	40.3	54.8	30.1
3. Assam	43.9	49.5	64.9	57.7
4. Bihar	47.3	57.6	61.0	58.3
5. Goa	5.5	8.9	14.7	11.8
6. Gujarat	17.6	23.7	24.2	19.4
7. Haryana	13.7	22.5	14.6	20.7
8. Himachal Pradesh	15.0	26.6	12.8	19.1
9. Jammu & Kashmir	9.3	13.7	9.5	11.4
10. Karnataka	19.8	28.2	28.9	28.3
11. Kerala	20.1	25.8	24.2	27.3
12. Maharashtra	24.4	42.0	31.6	34.6
13. Manipur	25.6	29.8	32.1	21.0
14. Meghalaya	22.2	26.2	13.9	14.4
15. Mizoram	8.1	8.3	5.0	5.0
16. Madhya Pradesh	17.4	30.5	38.0	29.8
17. Nagaland	2.0	3.5	10.5	0.0
18. Orissa	34.9	47.9	34.9	37.6
19. Punjab	8.2	11.9	8.9	8.9
20. Rajasthan	12.4	20.1	21.1	21.1
21. Sikkim	25.6	29.4	19.2	23.1
22. Tamil Nadu	22.2	33.8	42.7	36.8
23. Tripura	20.1	28.2	47.9	37.0
24. Uttar Pradesh	26.7	33.8	41.6	37.7
25. West Bengal	31.9	43.8	49.1	46.0

[a]OLP1, OLP2 correspond to ρ, θ (estimated) and $\rho = \theta = 1$, respectively.

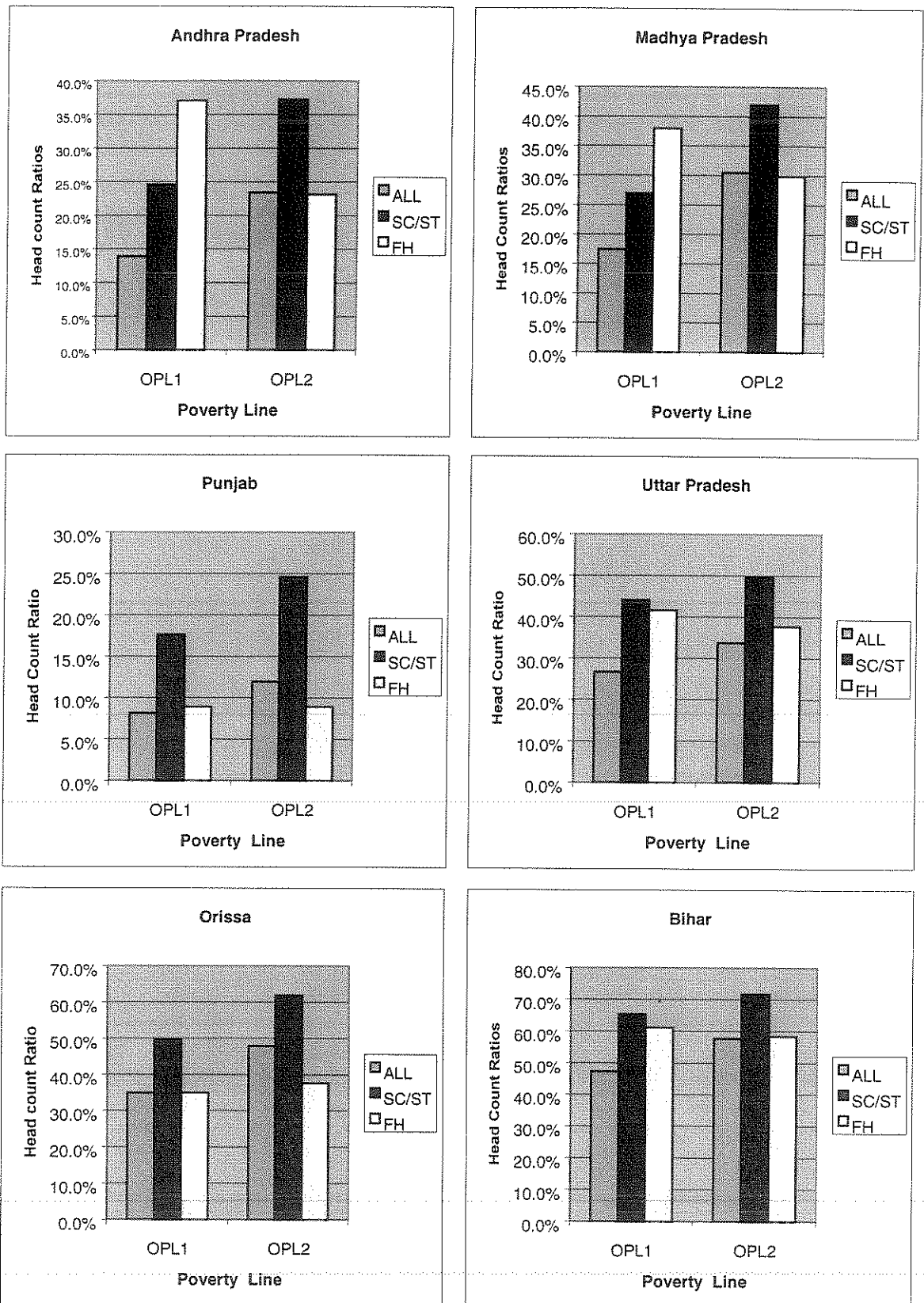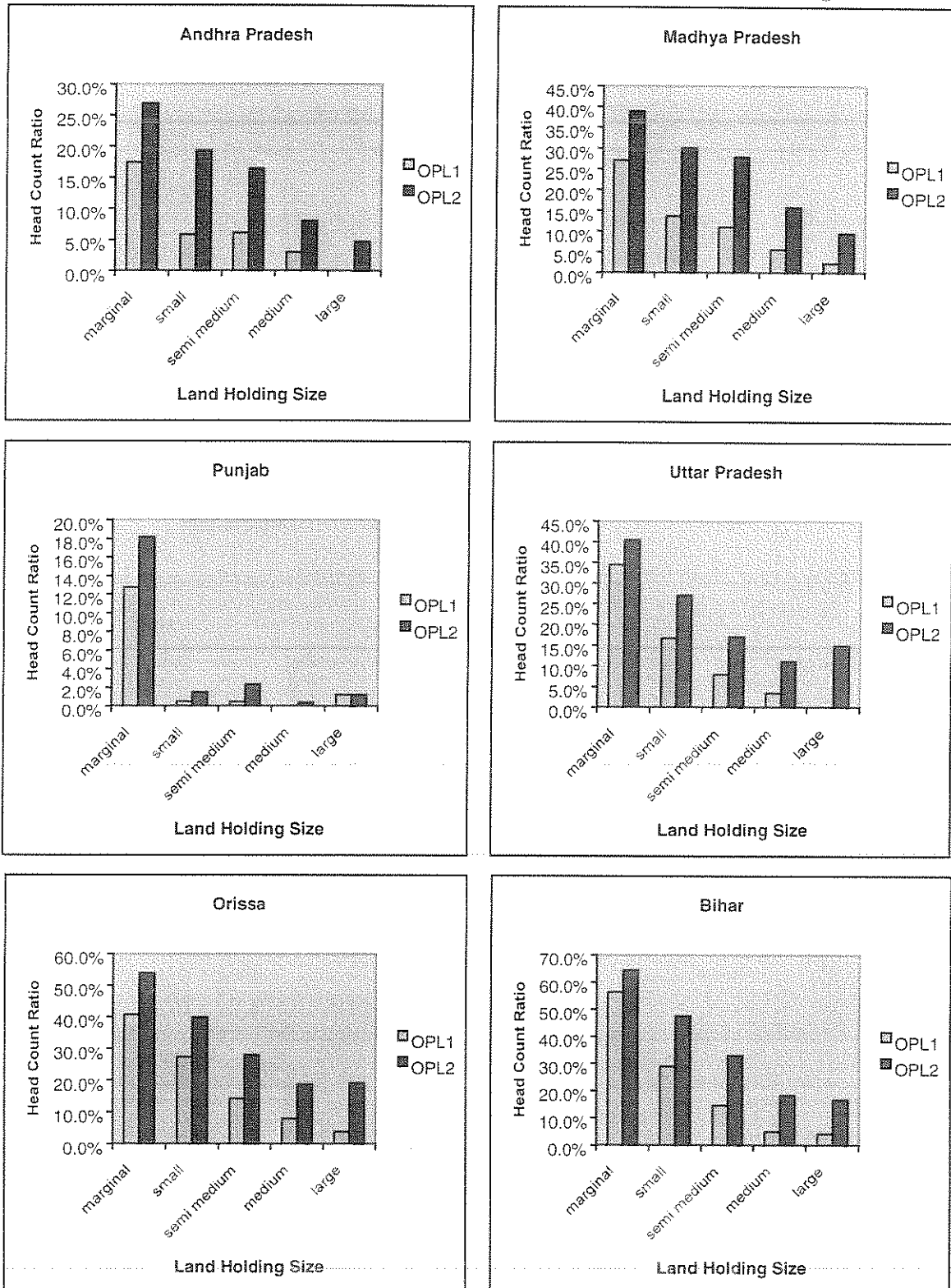# Figure 1: Poverty Estimates in Selected States for Aggregate Population and Subgroups (SC/ST, FHH)

Figure 2: Poverty Estimates in Selected States by Size of Landholdings [a]

a) The 5 land holding size categories are defined as: 0-1.01 hectares (marginal), 1.01-2 hectares (small),
2-4 hectares (semi medium), 4-10 hectares (medium), and greater than ten hectares (large)