ALL-INDIA CONSUMPTION INEQUALITY: AN INTRA-SECTORAL AND INTER-SECTORAL DECOMPOSITION

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SUMMARY. This paper attempts an intra-sectoral and inter-sectoral decomposition of Lorenz Ratio measure of All-India consumption inequality in normal terms and finds the structure to be relatively unchanged during 1961/62 to 1973/74.

1. INTRODUCTION

Studies on inequality in India have concentrated largely on estimating Lorenz ratio of consumption distributions by sectors at the national and state levels. An exhaustive review of literature in this regard can be found in Bardhan (1974) and Iyengar (1978). Going through the literature, one finds that few attempts have been made to examine inequality at the national level, let alone its examination by decomposition.

This paper attempts to provide estimates of Lorenz ratio for the All-India consumption distributions using the data from eleven NSS rounds—17 to 28th (i.e. for the years from 1961/62 to 1973/74). Further, it attempts to decompose the national inequality into its sectoral—rural and urban—components and examine the contribution of inter-sectoral disparity to overall inequality. The paper is organized along the following lines : Section 2 deals with methodology. In Section 3, we present the results of the study. The final section gives the concluding remarks.

2. METHODOLOGY

Before setting out the Gini decomposition formula developed by Ramakrishna (1984), we begin by defining Gini as :

$$G = \int_0^\infty F(X)(1-F(X))dx/\mu \qquad \qquad \text{... (1)}$$

where

$\quad G$ = Gini ratio

$\quad F(X)$ = Distribution function of the variable X

$\quad \mu = E[X]$ i.e. mean of X

If F_i is the distribution function for the ith sector and p_i is the population proportion of that sector, then

$$F(X) = \sum_{i=1}^{K} p_i F_i(X) \qquad \qquad \ldots \ (2)$$

where K is the number f sectors. Using relation (2) in (1), we get

$$G = \sum p_i w_i G_i + \sum_{i>j} \sum p_i p_j D_{ij}/\mu$$

where

$\qquad w_i = p_i \mu_i/\mu \qquad$ consumption share of the ith sector

$$D_{ij} = \int_0^{\infty} (F_1 + F_2 - 2F_1 F_2)\, dx$$

which is a measure of inter-sectoral disparity.

It may be noted that the NSSO provides consumption distribution by sectors—rural and urban—only. It does not provide data for the entire economy as a whole. Faced with this problem, we are left with no choice but to obtain an all-India distribution by pooling the rural and urban ones. This is done by using the respective sectoral population proportions as weights. We have obtained information on population from the 1961 and 1971 censuses. Population estimates pertaining to the inter-decennial years are made based on the compound growth rate formula.

The distributions so obtained for all-India suffer from the same limitation as the initial sectoral distributions i.e. they ignore intra-group inequality. The NSSO provides consumption distributions in the form of size distribution of population across different expenditure classes with mean consumption corresponding to each class. The use of group mean consumption perforce forces us to assume intra-group equality, thereby yielding underestimates of Lorenz ratio and other distortions (See, Suryanarayana, 1984).

We have sought to overcome this problem following Ramakrishna (1984), by obtaining total inequality as the sum of 'between iequality' (L) and within inequality. The former component is given by

$$L = 1 - \Sigma(P_i - P_{i-1})\ (Q_i + Q_{i-1}) \qquad \ldots \ (3)$$

where

$\qquad L = $ Lorenz ratio ;

$\qquad P_i = $ Cumulative proportion of population including the ith group ;

$\qquad Q_i = $ Cumulative proportion of consumption share corresponding to P_i

The latter arises from grouping and may be expressed as

$$\sum_{i=1}^{K} (P_i - P_{i-1})(Q_i - Q_{i-1})L_i \qquad \ldots \quad (4)$$

where L_i is the Lorenz ratio for the distribution within the class interval (Y_{i-1}, Y_i). Assuming a uniform distribution, L_i can be estimated by :

$$L_i = \frac{(Y_i - Y_{i-1})}{3(Y_i + Y_{i-1})}, \quad i = 1, 2, \ldots, K. \qquad \ldots \quad (5)$$

and, when Y_k is not finite, L_i tends to $1/3$.

Thus, Lorenz ratio estimates for a given distribution, be it for all-India or the sectoral ones, is obtained by the formula.

$$\text{Total inequality} = \Sigma (P_i - P_{i-1})(Q_i + Q_{i-1})$$
$$+ \Sigma (P_i - P_{i-1})(Q_i - Q_{i-1})L_i$$

where L_i is given by relation (5).

Our study is based on consumption data given in current prices. Hence, the estimates are only those of nominal inequalities. We have not made adjustments for the differential price changes across income groups and sectors.

3. RESULTS

Table 1 presents estimates of Lorenz ratio for consumption distribution of all-India, India rural and India urban in current prices. In general, they

TABLE 1.   ESTIMATES OF LORENZ RATIO BY SECTORS,
ALL-INDIA (IN CURRENT PRICES)

year	All-India	Lorenz Ratio	
		India Rural	India Urban
1961/62	0.3347	0.3160	0.3621
1963/64	0.3248	0.3003	0.3664
1964/65	0.3115	0.2969	0.3572
1965/66	0.3149	0.3008	0.3468
1966/67	0.3146	0.2976	0.3490
1967/68	0.3104	0.2957	0.3480
1968/69	0.3267	0.3102	0.3461
1969/70	0.3213	0.2983	0.3617
1970/71	0.3144	0.2887	0.3520
1972/73	0.3166	0.3041	0.3482
1973/74	0.2965	0.2822	0.3103

show a tendency for improvement in the distribution of consumptuion. How-ever, these are not real tendencies since they are concealed by the price factor which has not been adjusted for in the data set.

Table 2 presents Lorenz ratio estimates for all-India and its decomposition into intra-sectoral and inter-sectoral components. The table shows that the inter-sectoral disparity contributes, in general, to about 40 per cent of overall inequality at the national level. This structure does not seem to have changed to a significant extent during the period of the study.

TABLE 2. INEQUALITY DECOMPOSITION- ALL INDIA
(IN CURRENT PRICES)

year	All-India Lorenz ratio	intra-sectoral component	inter-sector component	percentage contri- bution of inter- sectoral disparity
1961/62	0.3347	0.2131	0.1216	36.33
1963/64	0.3248	0.2009	0.1239	38.15
1964/65	0.3115	0.2006	0.1100	35.60
1965/66	0.3149	0.2033	0.1116	35.44
1966/67	0.3146	0.1994	0.1152	36.62
1967/68	0.3104	0.1976	0.1128	36.34
1968/69	0.3267	0.2047	0.1220	37.34
1969/70	0.3213	0.1960	0.1253	39.00
1970/71	0.3144	0.1882	0.1262	40.14
1972/73	0.3166	0.1971	0.1195	37.74
1973/74	0.2965	0.1838	0.1127	38.01

4. CONCLUDING REMARKS

In this paper, an attempt has been made to estimate consumption inequa-lity, as measured by the Lorenz ratio, at the all-India level and its decomposi-tion into intra-sectoral and inter-sectoral parts. Broadly, we find a tendency for improvement in the distribution of consumption. It is also found that in India inter-sectoral disparity accounts for more than one-third of overall inequality at the national level. This structure of inequality seems to have remained the same throughout the sixties and early seventies. However, this cannot be considered to be the definitive picture about the inequality change since the study is based on data unadjusted for differential price movements across sectors and income groups.

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