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INTER-REGIONAL AND INTRA-REGIONAL INEQUALITY IN HOUSEHOLD CONSUMER EXPENDITURE IN RURAL INDIA

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A comparative study of the size distribution of household consumer expenditure of different regions in rural India assumes special significance in the context of regional planning. It indicates, besides the varied levels of living, the inequality between regions and inequality within regions. That is, given two such size distributions, differing in space, we can compare the means and also the inequalities of the two size distributions. Such a study will shed light on the regional difference of some of the growth parameters in a federal economy like India. Apart from enabling us to answer those questions as to whether there is marked skewness in the levels of living between regions and within regions, this study helps us to answer many other questions of a more utilitarian nature. Estimation of income parameters in a demand function is possible if data on the size distribution of consumer expenditure are available. Such estimation will facilitate to project the future effective demand for goods and services. Again general fiscal policies have hardly succeeded to penetrate into the rural sector to raise revenues much needed for the planning process. So, it is an imperative need to assess how far the rural sector can cater to the revenue requirements of the national exchequer. It is in this context, the study of the inequalities in the distribution of the rural household expenditure deserves special attention. And our main purpose is to evaluate how the benefits accrued from the developmental activities in the rural sector are enjoyed by the different strata of population and by the different regions of the country. With this objective in view, we estimate the inequality between regions and inequalities within regions in rural India based on Statewise estimates of household consumer expenditure for the 17th round (September 1961—July, 1962) of the National Sample Survey (NSS) (first year of the Third Five-Year Plan).

Brief information regarding the NSS consumer expenditure data utilized here is given in section II. Section III examines some qualifications of Gini-Lorenz ratio as an index of inequality. We have divided overall (all-region) inequality into two components: (1) between region inequality and (2) within region inequality. Section IV presents the picture of between region and all-region inequalities at nominal prices for rural India. In section V, we shall concentrate our attention on within region inequalities for all the regions. In section VI, the last one, some concluding observations are made.

II

The NSS is multipurpose socio-economic enquiry of all-India coverage, carried out in the form of successive 'rounds,' each 'round' taking a few months to one year for its completion.[1]   Our data are taken from the estimates for the distribution of population by size classes of monthly per capita total consumer expenditure on all items for the 17th round.   The 17th round of the NSS was carried out during September, 1961—July, 1962.   In the rural sector 7,173 sample households from 3,639 sample villages were covered for the survey on consumer expenditure.   The data were collected from the sample households by the interview method.   Sample households were selected on the basis of probability sampling.   The design adopted for the survey was stratified two-stage self-weighted where the first stage units were villages and the second stage units were households from which information was collected.

III

The Lorenz curve (or the Gini concentration curve) is widely used for the graphical representation of the inequality aspect of the size distribution of household consumer expenditure.   This is due to Italian statisticians Gini and Lorenz.   The choice of Lorenz curve over other measures of inequality is due to the fact that it does not depend on any distribution assumption and it is more convenient to compute.   But this measure is subject to serious criticism since it is based on unrealistic standard of either perfect equality (as a frame of reference for Lorenz curve) or perfect inequality (as a frame of reference of Gini's concentration ratio).   "A measure of inequality is essentially a measure of deviation from an optimum distribution which is itself hard to define, short of complete equality as represented, for instance, by the diagonal in the Lorenz curve."[2]   This optimum distribution can be derived from the principles of welfare economics.   However, other approaches can also yield definite ideal size distribution of consumer expenditure exhibiting given sets of economic, political and ethical principles.   In the context of modern economy this normative approach leads to the investigation of the determinants of inequality and rationalisation of the size distributions of consumer expenditure accordingly.   But the difficulty of constructing any acceptable optimum distribution stands against such use of sophistication.

We shall use in the following Gini-Lorenz ratio as an index of inequality. The Lorenz curve can be obtained by plotting cumulative percentage share of consumer expenditure $Q_j = \sum_{i=1}^{j} p_i \bar{y}_i \Big/ \sum_{i=1}^{13} p_i \bar{y}_i$ against the corresponding cumulative percentages of population $P_j = \sum_{i=1}^{j} p_i$, for $j = 1, 2 \ldots 13$ and successively joining these points and the point $(P_o, Q_o) = (O, O)$ by straight lines.

Gini-Lorenz ratio (concentration coefficient) can be defined as twice the area of the concentration, 2A, say, $i.e.$, twice the area between the Egalitarian

1.   P. C. Mahalanobis and S. B. Sen, "On Some Aspects of Indian National Sample Survey," *Bulletin of the International Statistical Institute*, Vol. 34, 1954.

2.   K. R. Ranadive, "The Equality of Incomes in India," *Bulletin of the Oxford University of Economics and Statistics*, Vol. 27, 1965, pp. 119-134.

line and the Lorenz curve. An alternative measure of Gini-Lorenz ratio is equal to $\triangle/2\mu$ where $\triangle$ is the Gini mean difference and μ is the arithmetic mean. Geometrical considerations demonstrate the equivalence of the two definitions, *i.e.*, $\triangle/2\mu = 2A$.

Following trapezoidal rule, the concentration coefficient can be computed from the relation $L = 1 - \sum_{j=1}^{13} P_j (Q_j + Q_{j-1})$.

Again overall inequality can be split into two components : (1) between regions and (2) within regions. Between region component of inequality is equivalent to $\triangle B/2\mu$ where $\triangle B$ is the between region component of Gini mean difference. This technique of isolating regional inequality from all-region or overall inequality has been developed by Bhattacharya and Mahalanobis of the Indian Statistical Institute.[3]

<div align="center">IV</div>

Earlier we have mentioned that our main purpose is to evaluate the regional inequalities for rural India. For this, we consider each State as a region. The greater the homogeneity within regions and heterogeneity between regions, the greater would be the between region inequality. Hence the choice of State as a region is not an optimum choice in the sense of minimizing the variability of the levels of living within regions and maximizing the same between regions. The choice is again plagued by including a heterogeneous region called 'Union Territory' consisting of four non-contiguous areas (Delhi, Himachal Pradesh, Manipur and Tripura). Thus the choice of State as a region is a minor drawback of our study.

Now, it would be profitable to probe into the varied levels of living in different regions. For this we present for each State the average per capita total consumer expenditure and this as percentage of all-India average for the rural sector in Table I.

TABLE I—REGIONWISE AVERAGE PER CAPITA TOTAL CONSUMER EXPENDITURE AND THIS AS PERCENTAGE OF ALL-INDIA AVERAGE IN THE RURAL SECTOR : NSS 17TH ROUND (SEPTEMBER, 1961—JULY, 1962)

Region (State)	Average per capita consumer expenditure in Rs. $(\bar{y}_i)$ (combined sample)	Average per capita expenditure as percentage of all-India average
Andhra Pradesh	19·96	92·3
Assam	22·03	101·8
Bihar	18·96	87·7
Gujarat	22·75	105·2
Jammu & Kashmir	24·65	114·0
Kerala	21·00	97·1
Madhya Pradesh	21·47	99·3
Madras	21·69	100·3
Maharashtra	19·62	90·7
Mysore	24·98	115·5
Orissa	17·40	80·4
Punjab	32·68	151·1
Rajasthan	23·62	109·2
Uttar Pradesh	22·56	104·3
West Bengal	20·81	96·2
Union Territory	25·52	116·7
All-India	21·63	100·00

3. N. Bhattacharya and B. Mahalanobis, "Regional Disparities in Household Consumption in India," American Statistical Association, 1967.

Table I exhibits the lowest standard of living in Orissa and the highest standard of living in the Punjab. The average per capita expenditure as a percentage of all-India average ranges from 80.4 per cent to 151.1 per cent.

In Table II, we present the percentage share of each region in the aggregate population (p_j) and in the aggregate consumer expenditure of rural India (q_j). Table III relating to the 17th round rural estimates explains how such shares can be used for the construction of the between region Lorenz curve of consumer expenditure.

TABLE II—PERCENTAGE SHARE OF DIFFERENT REGIONS IN THE POPULATION AND IN THE
AGGREGATE CONSUMER EXPENDITURE DURING NSS 17TH ROUND
(SEPTEMBER, 1961—JULY, 1962)

Region (State)	Percentage share of population (p_j)	Percentage share of consumer expenditure (q_j)
Andhra Pradesh	8·25	7·56
Assam	3·08	3·16
Bihar	11·83	10·29
Gujarat	4·35	4·55
Jammu & Kashmir	0·83	0·94
Kerala	4·00	3·86
Madhya Pradesh	7·77	7·65
Madras	6·81	6·78
Maharashtra	7·89	7·10
Mysore	5·12	5·87
Orissa	4·57	3·64
Punjab	4·53	6·80
Rajasthan	4·74	5·14
Uttar Pradesh	17·87	18·50
West Bengal	7·42	7·08
Union Territory	0·94	1·08
All-India	100·00	100·00
Estimated population (million) ..	365·52	—

TABLE III—RANKING OF REGIONS AND BETWEEN REGIONS CONCENTRATION CURVE FOR COMBINED SAMPLE IN RURAL INDIA : NSS 17TH ROUND (SEPTEMBER, 1961 — JULY, 1962)

Rank-ing*	Region (State)	Average consumer expenditure per person per 30 days in Rs. $(\bar{y}_j)$	Cumulative percentage of population $(P_j = \text{Cum. } p_j)$	Cumulative percentage of consumer expenditure $(Q_j = \text{Cum. } q_j)$
1.	Orissa	17·40	4·57	3·64
2.	Bihar	18·96	16·40	13·93
3.	Maharashtra	19·62	24·29	21·03
4.	Andhra Pradesh..	19·96	32·54	28·59
5.	West Bengal	20·81	39·96	35·67
6.	Kerala	21·00	43·96	39·53
7.	Madhya Pradesh..	21·47	51·73	47·18
8.	Madras	21·69	58·54	53·96
9.	Assam	22·03	61·62	57·12
10.	Uttar Pradesh	22·56	79·49	75·62
11.	Gujarat	22·75	83·84	80·17
12.	Rajasthan	23·62	88·58	85·31
13.	Jammu & Kashmir	24·65	89·41	86·25
14.	Mysore	24·98	94·53	92·12
15.	Union Territories	25·25	95·47	93·20
16.	Punjab	32·68	100·00	100·00

* In an ascending order of average consumer expenditure per person per 30 days.

In Table III, the regions are ranked in an ascending order of average per capita consumer expenditure $(\bar{y}_j)$. Next, we calculate cumulative percentages of consumer expenditure (Q_j) and of population (P_j) upto each rank j, j=1, 2 .... 16. Plotting Q_j against P_j and successively joining the points for different j and the points (O, O) by straight lines, we get the between region Lorenz curve for rural India. Now, between region inequality coincides with the overall inequality in the limit when within region inequality is completely eliminated and the region averages remain unchanged. "It shows the extent to which overall inequalities in consumption shares could be reduced if each region is separately engaged in completely equalising internal redistribution, without modifying regional shares."[4]

4. N. Bhattacharya and B. Mahalanobis, *op. cit.*

The overall and all-region Lorenz curve can be obtained by plotting cumulative percentage share of consumer expenditure $Q_j = \sum_{i=1}^{j} p_i \bar{y}_i \Big/ \sum_{i=1}^{13} p_i \bar{y}_i$ against cumulative percentage share of population $P_j = \sum_{i=1}^{j} p_i$ (where p_i is the estimated proportion of population in the i th size class of per capita consumer expenditure) for $j = 1, 2 \ldots 13$ and successively joining these points and the point (O, O) by smooth curves. In Figure 1 all-region and between region Lorenz curves are drawn.
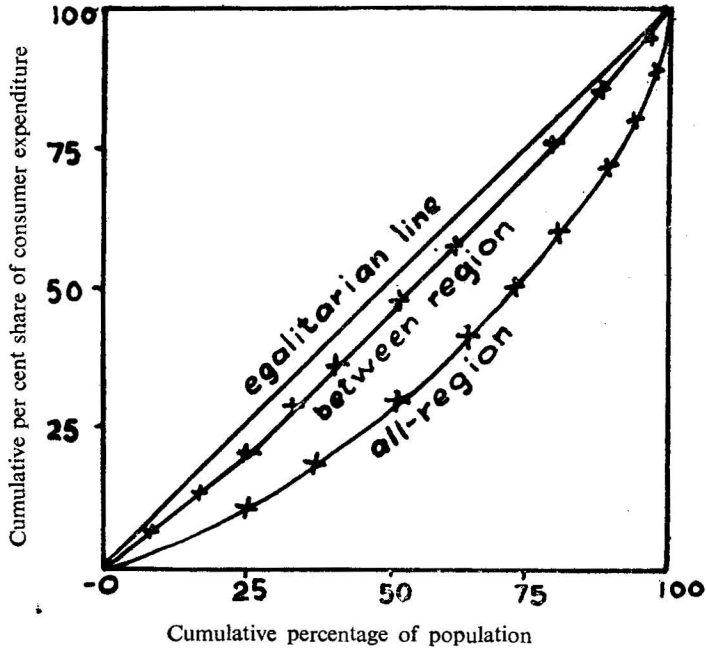

Figure 1—Between Regions (States) and All-Region Lorenz Curves of Size Distributions of Persons by Per Capita Household Consumer Expenditure for Rural India : NSS 17th Round

The concentration coefficient is calculated on the basis of the relation $L = 1 - \sum_{j=1}^{13} p_j (Q_j + Q_{j-1})$. Table IV gives the summary result of this section.

TABLE IV—ALL-REGION AND BETWEEN REGION INEQUALITY IN CONSUMER EXPENDITURE IN RURAL INDIA : NSS 17TH ROUND (SEPTEMBER, 1961—JULY, 1962)

Sector	Measure of inequality	Between region (combined sample)	All-region (overall) (combined sample)
Rural	Gini-Lorenz ratio	0·067	0·312

Our analysis is restricted by the fact that we have ignored the price variations between regions in spite of the existence of some amount of variations in prices from one region to another region. Ignoring this limitation of our study, it can roughly be concluded that 21 per cent of the overall inequality could be ascribed to the regional factor.

V

In Table V, we present within region inequalities and the average per capita household expenditure for all regions in rural India. Gini-Lorenz ratios range from 0.221 to 0.369.

TABLE V—GINI-LORENZ MEASURE OF INEQUALITY IN HOUSEHOLD CONSUMER EXPENDITURE AND AVERAGE PER CAPITA CONSUMER EXPENDITURE WITHIN DIFFERENT REGIONS OF INDIA FOR RURAL SECTOR : NSS 17TH ROUND (SEPTEMBER, 1961—JULY, 1962)

Region (State)	Gini-Lorenz ratio of household consumer expenditure	Average per capita household expendi- (ture $\bar{y}_j$)
Andhra Pradesh	0·314	19·96
Assam	0·221	22·03
Bihar	0·278	18·96
Gujarat	0·260	22·75
Jammu & Kashmir	0·261	24·65
Kerala	0·323	21·00
Madhya Pradesh	0·340	21·47
Madras	0·303	21·69
Maharashtra	0·273	19·62
Mysore	0·369	24·98
Orissa	0·293	17·40
Punjab	0·346	32·68
Rajasthan	0·362	23·62
Uttar Pradesh	0·312	22·56
West Bengal	0·273	20·81
Union Territories	0·246	25·25
All-India	0·312	21·63

Sometimes it is suggested that inequality grows with riches. So it would be useful to test the hypothesis of correlation between economic development and inequality in household consumption. The sample value of the Spearman's rank correlation between the two characteristics is $\varrho = 0.1204$. This is not significant at 5 per cent level of significance.

In this context we should note one thing that a high inequality in an economy with large per capita consumer expenditure implies less human hardship than the same level of inequality with low per capita consumer expenditure. The people of Punjab with lower inequality and higher average per capita expenditure are certainly better off than those of Rajasthan and Mysore with higher inequalities but lower average per capita expenditure. Again in Maharashtra and West Bengal though the inequality is the same, *i.e.*, equal to 0.273, yet the level of living in West Bengal is higher than that of Maharashtra. Thus the same amount of inequality with different degrees of development would lead to unequal incidence of hardship on the individuals of the region.

VI

Apart from the limitation of the data, our study suffers from some other drawbacks. We have ignored regional price differential which is real and varied consumption habits of individual regions. And lack of perfect within region homogeneity is another drawback. In spite of these drawbacks, this study will certainly have some operational significance in the context of regional planning. Here we should remember that if each individual region is given the task of eliminating internal inequality in the distributive share of household consumer expenditure, the central planning authority would have the responsibility to eliminate 21 per cent of the overall inequalities (due to regional differences) and to rationalise the policy accordingly.

INCOME DISTRIBUTION AND SAVING-INVESTMENT PATTERN OF CULTIVATING HOUSEHOLDS
(CASE STUDIES IN ORISSA)

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Introduction

Consumption, saving and investment pattern of a household may be related with its income in at least two ways—one by the level of income and another by the trend of income change. The first represents the static income level while the second depicts the dynamic aspects of income. The relative share of different consumption and investment items change when the income of the household changes from one level to another. It is a commonplace experience that the percentage of income spent on food is much higher in the case of the lower income-group than in the upper income-group. Similarly, the expenditure on non-essentials and luxury goods is always higher in the higher income classes. An analysis of one point cross-sectional data will indicate how the saving and expenditure pattern behaves in different levels of income in a *ceteris paribus* set-up.