Hierarchical Preference and Consumption Deprivation

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Abstract

In this paper we propose a method of determining the hierarchy of preferences among the *necessary/basic needs* items in the consumption basket. We also suggest an aggregate measure of *consumption deprivation*, a notion introduced herein. The empirical analysis is based on the Indian National Sample Survey data.

Keywords: Asia; India; Basic needs; Hierarchy; Deprivation

JEL classification: D12; D31; D63

1 Introduction

The static theory of consumer behaviour is concerned with maximisation of the consumer's utility subject to his budget constraint, which gives the optimal solution for the quantities of the items of consumption as functions of prices and income. This solution is optimal in the sense that it maximises utility subject to the consumer's budget. However, this does not mean that the consumer is totally *contented* with the allocation[2].

An individual's perception of well-being may be reflected through (i) his own perceived consumption norms, or (ii) his consumption in relation

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[2]The notion of *contentment/deprivation* can be related to the *capability approach* (Sen (1985, 1993)), which differs from *utilitarian evaluation* in making room for a variety of human acts and for valuing various freedoms in the form of capabilities.

to consumption of persons richer/poorer than him. In the former case one can derive a subjective poverty line based on the individual's own well-defined consumption needs, and there is no presumption that these needs will be met at the consumer's utility maximising consumption vector. The standard poverty analysis can then be pursued. Pradhan and Ravallion (2000) have examined this aspect and have implemented the method using survey data for Jamaica and Nepal.

This paper is concerned with the second aspect, that is the individual's feeling of deprivation relative to the other consumers, primarily in respect of the basic needs items. It looks at the spending pattern of an individual, represented through the budget shares, in relation to those of the richest and the poorest persons of the society and terms the individual as *deprived* or *satisfied* suitably. The main aim of this paper is to endogenously determine the hierarchy of preferences among the *basic needs* items using the above notion of deprivation. It is now well recognised that consumers have a hierarchical preference structure (see Murphy, Shleifer and Vishney (1989), Drakopoulos (1990), Encarnación (1990), Eswaran and Kotwal (1993), Sitaramam et.al.(1996)). However, the method we propose here is a more general one in the sense that it does not depend on any parametric form. An aggregate measure of *consumption deprivation* is also proposed.

Keeping in mind *Engel's law* that poorer the person, higher the share of expenditure on *food/necessary* items and that the reverse is true for *luxury* items, we attempt to identify a *deprived* person by comparing the budget shares of the *necessary/basic needs* items and the *luxury/non basic* items. We assume that the preference structure/utility function is identical for all consumers, thus yielding identical budget share curves for each individual. [3] We may note that *deprivation* is associated with the level of income of the consumer, but rather than looking at just the level of income we look at the allocation of income to different items of consumption, which leads us to a more disaggregated set-up. Thus, this approach deviates from the standard approach of measurement of *deprivation* and *poverty* based on the distribution of income, on which

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[3]Admittedly, the assumption of identical preferences is a restrictive one. Strictly speaking, our approach would work better for a closed society or a small group of people. For a large economy like India our approach would provide an approximation to the feeling of consumption deprivation.

a considerable literature exists (see Yitzhaki (1979), Hey and Lambert (1980) and Chakravarty and Mukherjee (1999)). It may, however, be mentioned that consumption based welfare measures have been advocated by Slesnick (1993), Yitzhaki (1994) and Garner (1993). It may also be mentioned that our approach is different from the recent work (Mukherjee,2001) on measurement of commodity specific deprivation, where all commodities are treated at par without any distinction between *basic* and *nonbasic* items.

The plan of the paper is as follows : section 2 deals with determination of the priority status of the *basic needs* items and introduces the notion of deprivation. Section 3 proposes an aggregate measure of *deprivation*, section 4 presents the empirical results and finally section 5 gives some concluding remarks.

2   Deprivation and the Priority Status of Basic Needs Items

Let there be n individuals in a community, who potentially consume a large number of commodities. We assume that there are k basic goods. We combine all other goods to form a composite non basic good (this assumes that the nonbasic goods are substitutes within themselves), denoted by the $(k+1)$th item.

Let w_{ij} denote the budget share of the jth good for the ith individual; $i = 1, 2, \cdots, n; \ \ j = 1, 2, \cdots, k+1$. Now, define the following

$x_{ij} = \frac{w_{ij}}{\max_i\{w_{ij}\}} = g_j(p_1, p_2, \cdots, p_{k+1}, y_i); \ \ (say), \ \ i = 1, 2, \cdots, n; \ \ j = 1, 2, ..., k.$

and $x_{i,k+1} = \frac{w_{i,k+1}}{\max_i\{w_{i,k+1}\}} = f(p_1, p_2, \cdots, p_{k+1}, y_i) \ \ (say), \ \ i = 1, 2, \cdots, n.$

In view of Engel's law, $\max_i\{w_{ij}\}$ is the budget share of the poorest person for the basic item j. Thus, $x_{ij}; \ j = 1, 2, ..., k$ can be interpreted as the proximity of the ith person (in terms of budget share) to the poorest person with respect to commodity j. As a person gets richer,

the proximity to the poorest person decreases, that is, the distance (in terms of budget share) from the poorest person increases. Similarly, $\max_i\{w_{i,k+1}\}$ gives the budget share of the richest person with respect to the composite non-basic item $k+1$. Thus, $x_{i,k+1}$ represents the proximity of individual i to the richest person. Here, as a peerson gets richer, the proximity to the richest person increases, that is, the person is closer to the richest person in terms of budget share. Also note that such normalisation of w_{ij}'s provides a basis for comparison of budget shares across items. For example, one cannot say whether a budget share value of .004 for 'salt' signifies a low value and a budget share value of .03 for 'food grains' represents a high value unless one considers the distribution of budget shares of the items across individuals.

We now look at the properties of x_{ij}, $i = 1, 2, \cdots, n; j = 1, 2, \cdots, k$. :

(i) $0 < x_{ij} \leq 1$. (We assume that the budget share on any basic item is strictly positive for all i. x_{ij} is closest to zero when person i is the richest person and it is equal to one when person i is the poorest one with respect to item j.)

(ii) x_{ij} is a continuous function of income and prices, (since w_{ij} is a continuous function of income and prices), and

(iii) given prices, x_{ij} is a decreasing function of income (since w_{ij} is a decreasing function of income in view of the item being a 'necessary' item).

Properties of $x_{i,k+1}$, $i = 1, 2, ..., n$:

(i) $0 \leq x_{i,k+1} \leq 1$. ($x_{i,k+1}$ is equal to zero when person i is so poor that his consumption basket is limited only upto the basic items. $x_{i,k+1}$ is equal to one when person i is the richest person).

(ii) given prices, $x_{i,k+1}$ is a continuous function of income (since $w_{i,k+1}$ is a continuous function of income), and

(iii) given prices, $x_{i,k+1}$ is an increasing function of income (note that $\sum_{j=1}^{k+1} w_{ij} = 1$ and w_{ij}, $j = 1, 2, ...k$ are decreasing functions of income. Therefore, $w_{i,k+1} = 1 - \sum_{j=1}^{k} w_{ij}$ is an increasing function of income and hence $x_{i,k+1}$ is an increasing function of income).

Definition 1: We define a person i to be *deprived* with respect to item $j = 1, 2, ..., k$ if $x_{ij} > x_{i,k+1}$. That is, if the distance of person i from the poorest person with respect to the basic item j is smaller than his

distance from the richest person. Thus, $\frac{x_{ij}}{x_{i,k+1}} > 1 (< 1), j = 1, 2, ..., k$ for a *deprived* (*satisfied*) person i with respect to commodity j.

The idea behind this definition is that if the person is equidistant from the richest and the poorest persons, he/she is neither deprived, nor satisfied.

Definition 2: We define a person i to be *most deprived* when $x_{i,k+1} = 0$, that is, when his basket is limited only upto the basic goods.

Definition 3: We call a person *generally deprived* if he is deprived with respect to all basic commodities.

Note that, when $x_{i,k+1} = 0$, then $x_{ij} > x_{i,k+1}$ for $j = 1, 2, \cdots, k$. But, $x_{ij} > x_{i,k+1}$ for $j = 1, 2, \cdots, k$ need not imply $x_{i,k+1} = 0$. Thus, a person who is *most deprived* is *generally deprived*, but the converse is not true.

Definition 4: We call a person *satisfied* if he is satisfied with respect to all basic commodities.

Definition 5: The 'top priority' or 'most essential' basic item is the one, with respect to which whenever a person is *deprived*, he is *deprived* with respect to the rest of the basic items, and hence *generally deprived*.

Note that, as the basic needs items are typically necessary goods, the existence of the most essential basic item is guaranteed. Let us try to illustrate the idea through Figure 1. Suppose we consider four basic goods and one composite non basic good. Let (i) the normalised budget share curves for the four basic goods be given by $g_1(y), g_2(y), g_3(y)$ and $g_4(y)$ and that for the non basic good by $f(y)$, (ii) P_j, be the point of intersection of $g_j(y)$ and $f(y)$, $j = 1, 2, 3, 4$ and (iii) $y_j^*, j = 1, 2, 3, 4$ be the corresponding levels of income.

Note that for $y < y_3^*$ by our definition a person is *deprived* with respect to <u>all</u> basic commodities. For $y_3^* \leq y < y_4^*$ a person is *deprived* with respect to items 4, 2 and 1 and *satisfied* with respect to item 3. Similarly, for $y_4^* \leq y < y_2^*$ a person is *deprived* with respect to items 2 and 1 and *satisfied* with respect to items 3 and 4 and so on. Thus, a hierarchical nature of the basic items is evident from the structure and item 3 emerges as the *top priority* item. In other words, the basic item, whose normalised budget share curve cuts that of the non basic item

at the lowest income level, is the top priority item. y_3^* thus turns out to be the income level below which a person is *generally deprived*. The priority status of the other items can be determined as we move to the right along the curve $f(y)$.

3   A Cardinal Representation of Consumption Deprivation

We now postulate some desirable properties that a cardinal measure of deprivation should possess. We have a population of size n, where corresponding to each person i, there is an income y_i and an exogenously given vector of $(k + 1)$ prices $p \in R_{++}^{k+1}$, corresponding to the $(k + 1)$ commodities, where R_{++}^{k+1} is the positive orthant of the $k + 1$ dimensional Euclidean space.

The measure of deprivation is a function $D : S \rightarrow R_+^1$, where $S = R_{++}^{k+1} \times R_+^n$ in view of R_+^n being the domain of the income vector $y = (y_1, y_2, \cdots, y_n)$. For any $p \in R_{++}^{k+1}$, $y \in R_+^n$, $D(p, y)$ gives the extent of deprivation associated with consumption of items $1, 2, \ldots k + 1$. The properties we postulate are :

(i) **Homogeneity:** D is homogeneous of degree zero with respect to prices and income.

(ii) **Continuity:** D is a continuous function of income and prices.

(iii) **Symmetry:** Given prices, D is symmetric in income. That is, for any $(p, y) \in S$ and $(p, z) \in S, D(p, y) = D(p, z)$ where z is any permutation of the income vector y.

(iv) **Monotonicity:** Given prices, D is monotonically decreasing in income.

(v) **Replication invariance:** Replicating the population m times does not change the measure. That is, given prices, $D(p, y^m) = D(p, y)$, where y^m is the m-fold replication of y.

(vi) **Boundedness:** D should be bounded between 0 and 1. The lower bound will be achieved when all persons are *satisfied* and the upper bound will be achieved when all persons are *most deprived*.

Homogeneity implies that proportionate change in income and prices does not affect the measure. **Continuity** ensures that D will not be oversensitive to small changes in one or more of its arguments. **Symmetry** means that given prices, no characteristic other than the income of a person is relevant for measurement of deprivation. **Monotonicity** says that *deprivation* should decrease with income. **Replication invariance** enables us to compare *deprivation* between two unequal sized populations. This is useful for comparing the same society over different time periods or comparing two societies at the same point of time. Thus, this implicitly subsumes the assumption of interpersonal utility comparability. Finally, **boundedness** is simply a normalisation of the measure.

We now formulate an aggregate measure of *deprivation* using our notion of *deprivation*. Recall that

$$x_{ij} = \frac{w_{ij}}{\max_i\{w_{ij}\}} \;\; = \;\; g_j(p_1, p_2, \cdots, p_{k+1}, y_i); \;\; j = 1, 2, \cdots, k.$$

$$\text{and} \qquad x_{i,k+1} \;\; = \;\; \frac{w_{i,k+1}}{\max_i\{w_{i,k+1}\}} = f(p_1, p_2, \cdots, p_{k+1}, y_i)$$

by the assumption that all consumers have identical budget share curves. Note that, given prices, by definition $\frac{\delta g_j}{\delta y} < 0$ and $\frac{\delta f}{\delta y} > 0$.

Let person i's aggregate deprivation be measured by

$$D_i = 1 - \{\Pi_{j=1}^{k} min[1, \frac{x_{i,k+1}}{x_{ij}}]\}^{1/k}.$$

The term $min[1, \frac{x_{i,k+1}}{x_{ij}}]$ basically gives the magnitude of person i's relative contentment for item j. If $x_{i,k+1} > x_{ij}$ for all j, that is, if he is satisfied with respect to all the basic needs items, then the value is 1 for all j. If he is not satisfied with respect to any one item, the value becomes less than 1 for that particular item. To aggregate over commodities, one can choose any measure of central tendency. Here, as an illustration, we choose the geometric mean, which enables us to capture the substitution possibilities among commodities (however, equal importance is attached to all basic needs items).[4] D_i thus gives the overall deprivation of person i.

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[4] In view of the fact that each x_{ij} is finite and the numerator $x_{i,k+1}$ is independent of j, the problem of one component of the product term being zero does not exist.

We now define the aggregate measure of deprivation by

$$D = h(D_1, D_2, \cdots, D_n; n).$$

For fixed n, h has the following properties:
(i) h is bounded, (ii) h is continuous and increasing in each D_i, (iii) it is symmetric under the permutation of the vector $(D_1, D_2, \cdots, D_n)$. When we allow n to vary, we have (iv) h is replication invariant in the sense that $h(D_1, D_2, \cdots, D_n; n) = h(D_1, D_1, \cdots, D_1, D_2, D_2, \cdots, D_2, \cdots, D_n, D_n, \cdots, D_n; mn)$ where each D_i is replicated m times for any positive integer m.

Let us look at some particular forms of h. Consider any increasing transformation of the following functions:

(i) symmetric mean of order r: $D = \begin{cases} (\frac{1}{n} \sum D_i^r)^{\frac{1}{r}}, & r \neq 0 \\ (\Pi D_i)^{\frac{1}{n}}, & r = 0 \end{cases}$

(ii) $D = \max\limits_{1 \leq i \leq n} \{D_i\}$.

(iii) Kolm-Pollak[5] type formulation:

$$D = \frac{-1}{\theta} log(\frac{\sum_{i=1}^{n} exp(-\theta D_i)}{n}); \;\; \theta \geq 0.$$

Consider example (i) with $r = 1$. That is, $D = \frac{1}{n} \sum_{i=1}^{n} D_i$ as an illustration of the proposed measure.
Here, the overall deprivation of each person in the society is averaged to obtain the aggregate measure of deprivation. Thus, $D = \frac{1}{n} \sum_{i=1}^{n} (1 - \{\Pi_{j=1}^{k} min[1, \frac{x_{i,k+1}}{x_{ij}}]\}^{1/k})$.

In what follows, we present the empirical results using Indian National Sample Survey data.

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[5]See Kolm (1976a, 1976b) and Pollak (1971).

4 Empirical Results

The data : The consumption data for rural and urban India have been taken from the published reports of the National Sample Survey (NSS), covering the period 1977–78 to 1990–91.[6] The data provide value of consumption at current prices for broad groups of items by income class along with the number of sample households in each class. The basic needs items of consumption considered here are *cereals, other basic food, pan, tobacco and intoxicants,* and *fuel and light* which are known to be necessary items for the Indian society [7].

To identify the hierarchy of preferences from the 'basic needs' commodities here, we plot the normalised budget shares of the four basic and one non basic commodities against the total expenditure for each round. Some selected plots are presented in Figure 2. As discussed earlier, the hierarchical nature of the commodities are evident from the figure. The hierarchy thus obtained is presented in Table 1. Clearly in urban India *cereals* is the top priority item and next is *fuel and light* in most of the cases. In rural India either *cereals* or *fuel and light* tends to be the top priority item.[8]

We now look at the total expenditure value that corresponds to the point of intersection of the normalised budget share curves of the top priority item and that of the non basic good. This total expenditure may be called the 'threshold level', as this is the income/total expenditure level below which a person is *generally deprived*, that is, *deprived* with respect to all basic items. Since we only have grouped data, for the 'threshold level' we take the lower limit of the class interval where this

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[6]The NSS conducts its surveys on a continuing basis in the form of successive rounds. Initially, during the period covered here, the enquiry was being conducted at an interval of 4 to 5 years. Thereafter, the NSS reverted to conducting the enquiry every year. Thus the time period covered in this study corresponds to 32nd round to 46th round. However, the sample sizes for rounds 42, 43 and 44 are much smaller compared to those for the other rounds.

[7]*Other basic food* includes gram, cereal substituties, pulses, edible oils, vegetables, fruits, sugar, salt and spices. The *non-basic composite* good consists of milk and milk products, meat, fish, egg, beverages and refreshment, clothing, footwear, miscellaneous goods and services and durable goods.

[8]It may be mentioned that for urban India this result compares well with that in Sitarmam et.al (1996).

crossover is observed. To examine how this threshold level corresponds to the conventional 'poverty line', Table 2 presents the 'threshold level' obtained from our analysis and the conventional 'poverty line' compiled in Suryanarayana and Geetha (1996) [9].The calorie based poverty line turns out to be lower than the 'threshold level'. This is consistent with the fact that the calorie based poverty line is confined to food consumption only, while *satisfaction* relates to both food and non food consumption[10]. The notion of *deprivation* we have discussed here is essentially a relative one. The conventional relative measures focus on persons who are in a relatively disadvantageous position in the society, e.g., relative poverty, where a person with income less than a certain percentage of the mean income may be regarded as *poor*. To examine the consistency of our notion with that of the conventional one, we compare the 'threshold level' with the mean per capita expenditure (PCE) over the rounds, which are also presented in Table 2.

To examine the relationship among these we ran some regressions, the results of which are presented in the Table 3. The regression of 'poverty line' on 'threshold level' shows that there is a strong linear relationship between the two with significant parameters. In the other regression, i.e., in the regression of the 'threshold level' on mean PCE, for rural India the slope is a significant 1.06 and for urban India a significant 0.75 with nonsignificant intercepts in both cases. Thus, the 'threshold level' belongs to the class of 'mean poverty line' ($z = \alpha\mu$, μ being the mean income and $\alpha > 0$), defined in Zheng (2001). The

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[9]The 'poverty line' is estimated at the level of consumer expenditure which provides for a normatively determined calorie amount. This is done based on the NSS data on consumption expenditure (see Dandekar and Rath (1971) and Perspective Planning Division (1981)).

[10]According to an expert group of the Planning Commission "the poverty line defines on an average the level of per capita per day expenditure which meets a normative minimum standard of living, deemed reasonable. Calorie intake is but one of the ingredients, though an important one, of the minimum standard, but the poverty line makes an allowance for non-food consumption needs as well on the basis of observed consumer behaviour. The Group recognises the desirability of defining the normative standard for non-food consumption and its constituents, without reference to actual behaviour, but until this is done, the existing basis seems to be the most practical and reasonable. It is this consumption basket that constitutes the minimum standard for defining the boundary between the poor and the non-poor" (Perspective Planning Division (1993)).

regression results can be interpreted as follows: any person in the rural sector having income less than 106 per cent of the mean is *generally deprived* and in the urban sector any person having less than 75 per cent of the mean income is *generally deprived*. This means that while an average person in the rural sector is *generally deprived*, an average person in the urban sector is not.

Next, we calculate the values of D making the necessary corrections for grouped data, where the sum is a weighted one, the weights being the population proportions in each income class. To see how D corresponds to the conventional poverty measure, Table 4 presents the values of D for different rounds for rural and urban India along with the Foster-Greer-Thorbecke (1984) index of poverty, given by $P_\alpha = \frac{1}{n} \sum_{i=1}^{q} (1 - \frac{y_i}{z})^\alpha$, for $\alpha = 3$,[11] where q is the number of persons below the poverty line z. The values of P_3 have been taken from Suryanarayana and Geetha (1996). The correlation coefficients between columns (3) and (4) and between columns (5) and (6) turn out to be 0.340 and -0.107, respectively. The low values of the correlation coefficient indicate that the measures of *deprivation* and *poverty* reveal two different aspects of well-being. Thus, while these are two related notions, one does not imply the other.

5 Concluding Remarks

Based on the notion that *deprivation* is not captured in the standard utility framework, in this paper we introduced the concept of *consumption deprivation*. We have attempted to identify a *deprived* person through his consumption basket. Partitioning the set of commodities into basic items and a composite non basic item a *deprived* person is identified using the ratio of the normalised budget shares of the basic items to the non basic one. A hierarchy of preferences of the basic items and a 'threshold level' of total expenditure are determined using NSS consumer expenditure data covering the period 1977–1991.

We discuss alternative classes of measures in light of some desirable properties of a measure of deprivation and identify a particular class of

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[11]The value of 3 for α is chosen in view of the fact that P_α satisfies all the desirable properties of a poverty index for $\alpha > 2$ (see Zheng, 1997).

measures which satisfy all these properties. We calculate the value of a member of this class using the NSS data. The analysis reveals that in urban India a person having income less than "75 per cent of the mean income" may be regarded as *generally deprived*, whereas for rural India a person having less than "1.06 times the mean income" may be regarded as *generally deprived*. However, there does not seem to be any relationship between the measures of *poverty* and *deprivation*.

The present analysis provides an alternative way of looking at well-being: the amount of deprivation prevailing in the society can be measured using the suggested index. Also, one can think of poverty analysis considering the 'threshold level', introduced here, rather than the exogenously given 'poverty line' in view of the fact that the former is highly correlated with the latter, but considers both food and nonfood items. It may, however, be mentioned that the proposed measure would be more appropriate for the LDC's, where subsistence is an important issue, than for developed countries, where even the poorest people tend to own major appliances like television sets or automobiles.

The proposed measure is particularly useful for comparing deprivation between, say, two societies, where the income distributions are the same, both have the same set of basic and non basic goods, but the consumption patterns are different (that is, the budget allocation among the commodities are different). In this case, while the inequality measure will be the same, the deprivation measure may be different.

The knowledge of the hierachy of preferences in a society is extremely useful from a planner's point of view. As we know, imposition of tax on necessary items is regressive, and therefore, it would be socially least harmful if the least preferred basic item is taxed.

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Table 1 : Hierarchy of Preferences of the Basic Needs Items in
Decreasing Order of Priority

year	NSS round	Rural India				Urban India			
(1)	(2)	(3)				(4)			
1977–78	32	FL	PTI	CR	OB	CR	FL	PTI	OB
1983	38	FL	CR	OB	PTI	CR	FL	PTI	OB
1986–87	42	FL	PTI	CR	OB	CR	FL	PTI	OB
1987–88	43	CR	FL	PTI	OB	CR	FL	OB	PTI
1988–89	44	CR	FL	PTI	OB	CR	FL	PTI	OB
1989–90	45	CR	FL	OB	PTI	CR	PTI	FL	OB
1990–91	46	FL	CR	PTI	OB	CR	PTI	FL	OB

CR : Cereals, OB : Other basic food, PTI : Pan, Tobacco and Intoxicants, FL : Fuel
and Light

Table 2 : Threshold Level and the Conventional Poverty Line at
Current Prices (Rs.)

Year	NSS Round	Rural India			Urban India		
		Conventional poverty line	Threshold level	Mean PCE	Conventional poverty line	Threshold level	Mean PCE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1977–78	32	48.45	60	68.89	55.17	80	96.15
1983	38	76.65	125	112.45	89.91	125	164.03
1986–87	42	86.70	150	140.93	114.46	125	226.02
1987–88	43	97.50	180	158.10	123.48	185	249.93
1988–89	44	108.60	180	175.10	134.79	215	266.83
1989–90	45	112.80	180	189.46	143.25	215	298.00
1990–91	46	124.50	215	202.12	159.71	255	326.75

Table 3 : Regression Results

Regression of	Rural India			Urban India		
	Intercept	Slope	R^2	Intercept	Slope	R^2
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Poverty line on threshold	16.47	0.50	0.96	25.83	0.53	0.90
(t-values)	(2.27)	(11.11)		(1.84)	(6.87)	
Threshold on mean PCE	−2.86	1.06	0.95	−2.52	0.75	0.90
(t-values)	(−0.17)	(9.77)		(−0.09)	(6.68)	

Table 4 : Values of the Aggregate Measure of Deprivation D and the Poverty Measure P_3

Year	NSS round	Rural India		Urban India	
		D	P_3	D	P_3
(1)	(2)	(3)	(4)	(5)	(6)
1977–78	32	0.1991	0.0202	0.1366	0.0107
1983	38	0.1800	0.0125	0.0712	0.0072
1986–87	42	0.2516	0.0079	0.2181	0.0068
005	0.0050	0.1892	0.0037		
1988–89	44	0.2048	0.0052	0.2033	0.0041
1989–90	45	0.1037	0.0042	0.1147	0.0035
1990–91	46	0.0747	0.0048	0.0953	0.0039