Indian Economic Review, Vol. XXII, No. 1

On the Choice of Appropriate Consumer Price Indices and Data Sets for Estimating the Incidence of Poverty in India

B. S. MINHAS, L. R. JAIN
S. M. KANSAL, and M. R. SALUJA*
Indian Statistical Institute, New Delhi

ABSTRACT

After reviewing the available data sets and price deflators used by the Planning Commission for estimation of poverty, this paper constructs some new consumer price indices which are considered more appropriate for updating the base year poverty lines. Three major factors, which crucially affect the poverty computations, have been identified and sensitivity analysis has been attempted to show the separate impact of each of these factors on the poverty estimates. Our analysis shows that the official estimates of poverty incidence suffer from many serious shortcomings, which lead to underestimation of the incidence of poverty in the country. Some suggestions for further research have also been made.

1. INTRODUCTION

Combating abject poverty is an important goal of national planning and public policy in India. It is, therefore, natural that the point estimates of incidence of poverty and change over time in numbers of the poor, as well as the proportion of population below the poverty line, should attract

*During the course of our work on this paper, we had the benefit of many valuable comments from Professor S. D. Tendulkar. His continuous interaction nudged us along to formulate the sensitivity analysis reported here. Some valuable comments on an earlier draft were also received from Professor Michael Lipton, which are gratefully acknowledged. Mr. B. Gill and Mr. Ashish Kumar of the Economic Analysis Division of N.S.S.O., bore the responsibility for organizing the compilation of data on rural retail prices and the computation of item-wise price relatives. We are happy to acknowledge our deep gratitude to them.

Thanks are also due to Messers Mehar Lal, V. P. Sharma and Harish Kumar for typing various drafts and final version of the paper with patience.

considerable attention both in political and academic debate in the country. Many different elements—normative, analytical and computational—enter this debate, where passions as well as professional skills are freely harnessed to underscore certain aspects of poverty. Our purpose in writing this paper is to pull together, in a common framework, the most important factors affecting poverty calculations and to suggest improvements for obtaining better estimates of changes in the incidence of poverty over time.

Although grounds do exist for serious disagreement, we shall not question in this paper the definition(s) of poverty line(s) adopted by the Planning Commission in the mid-1970s. The Commission fixed the minimum required percapita expenditure as the cut-off point for the poverty line at Rs. 49.09 per month for rural and Rs. 56.64 per month for urban India at 1973-74 prices. This 1973-74 poverty line has been updated by the Planning Commission for other years by using CSO's implicit price deflator from national private consumption expenditure. However, this updating procedure has some undesirable features. For instance, although the rural and urban poverty norms differ by about 15 percent in the base year, the Commission ignores the differentials in consumer price movements between the rural and urban areas over time as it uses the same price deflator for both.

Another serious difficulty is caused by the large adjustments made to the observed size distribution of NSS consumer expenditure. These adjustments have become a routine feature in the official estimates, where the adjustment factor used in a particular year in a uniform scalar equivalent to the ratio of CSO's estimate of total private consumption expenditure in the National Accounts to the total consumer expenditure estimated in a round of the National Sample Survey in the corresponding year.

The choice of the same implicit price deflator for adjusting the current price consumer expenditures (both in the rural as well as the urban sector), does manage to bypass the enormous task of constructing separate cost of living indices needed to reflect the impact of differential changes in consumer prices in rural and urban India. Nevertheless, the convenience and economy in computational efforts cannot forever remain as the main reason for avoiding scientifically better procedures. We must strive to construct appropriate indices to reflect the real costs of buying the rural and urban base-year consumer bundles of goods and services, separately, and use them in preference to the single implicit deflator of the national accounts. This should make amends for the wrong practice of neglecting the differences in price changes experienced in the rural and urban areas, but the question of selection of indices, appropriate for estimating the incidence of poverty, shall still remain. These issues are squarely addressed in this paper.

Until well into the mid-seventies, the official national accounts did not publish separate estimates of private consumption. Nevertheless some unofficial estimates, derived from product-flow method, had come into circulation around 1968 [see Tiwari (1968)]. These unofficial estimates of private consumption were claimed to be consistent with national income aggregates, but their coverage was somewhat larger than the NSS estimates of household consumption as they included the consumption expenditure of non-profit and charitable institutions.

In a partial attempt to adjust for these differences in coverage, some research workers [see for instance, Minhas (1969) and (1970)] had derived their estimates of rural poverty for the period ending with mid-sixties by using the data on fractile shares in the observed NSS consumption expenditure distribution and the ratios between rural and urban per capita consumption in different rounds of the NSS in conjunction with the estimates of average all India per capita consumption (at constant 1960-61 prices) derived from the accounting data. However, the poverty estimates derived by following this procedure also had the above mentioned shortcomings. One, that the base year poverty line was indirectly updated by using the implicit price deflator of private consumption estimates derived from the product-flow method. Second, the NSS per capita consumption estimates were prorata adjusted to product-flow based consumption estimates. The second adjustment could not have made significant impact on the consumption of poverty incidence in the sixties as the consumption estimates of NSS and product-flow method were only marginally different at the aggregative level in those years [see Mukherjee (1969) and Mukherjee and Chatterjee (1972)].

The national accounts data on private consumption are now available in greater detail by goods and services to permit close comparisons with the NSS estimates. This offers ample scope for reconciliation of certain apparent differences between the two sets of data. In other words, the choice of an apppropriate data set for poverty estimates can now be made on the basis of sound empirical evidence. Nevertheless, the Planning Commission continues to make large adjustments in the observed size distribution of consumer expenditure in a routine fashion without giving any justification for such one-sided, and often very large, adjustments. This disregard for facts has played havoc with the official estimates of poverty produced by the Planning Commission in 1985.

The question of pro-rata adjustments is discussed in Section 2, where we have examined the reasons for the differences in the 1983-84 consumption estimates of CSO and NSS and their impact on the computation of poverty incidence. A review of the already available consumer price indices and their limitations for updating the poverty line is contained in Section 3. We have constructed some new indices, which we believe

are more appropriate than the implicit deflator. These separate indices of costs of base-year bundles for rural and urban India, and the updated poverty lines derived by using these indices, are presented in Section 4.

In Section 5, we have computed the incidence of poverty in some recent years for the rural and urban sectors, making use of the newly computed indices. These estimates are further compared with the corresponding official estimates given in the Seventh Plan document.

In Section 6, we have carried out sensitivity analysis of poverty incidence with respect to each of the factors affecting the estimates, viz., poverty line norm, price deflators and the pro-rata adjustment made to the observed size distribution of consumer expenditure.

Some concluding remarks, recommendations and surmises comprise the seventh and the final section.

2. DIFFERENCES IN NSS AND CSO CONSUMPTION ESTIMATES AND THEIR IMPACT ON THE POVERTY INCIDENCE IN 1983-84

The National Account estimate of total private consumption expenditure for the year 1983-84 is higher by about 21 percent[1] than the estimate derived from the 38th round (1983) of the NSS. The Planning Commission has computed the incidence of poverty for 1983-84 after making a pro-rata upward adjustment of about 21% to the observed NSS distribution of consumer expenditure. It must nevertheless be noted that this large magnitude of the discrepancy (over 21%) is largely artificial : A major part of this apparent difference is due to difference in the reference periods of the estimates of consumption expenditure under the two sources. While the CSO estimates of private consumption in 1983-84 are based on agricultural production for the agriculture year July 83-June 84, the NSS consumption estimates for January to December 1983 (38th round) mostly pertain to agricultural production realised during the period July 82 to June 1983.

First crop of 1983-84 (Kharif) would have been harvested from October 1983 onwards. Thus, during the first ten months of the survey (i.e. from January to October 1983), the reported consumption of foodgrains by the households would entirely be from the Kharif and Rabi crops of 1982-83. Only in the last two months of the survey period (November and December), the reported foodgrain consumption could have been from the Kharif crop of 1983-84. For wheat, gram and barley, household consumption during the whole survey year (1983) would be from the Rabi crops of 1982-83. In fact in the first sub-round of the survey

[1]It may be noted that this figure of 21 percent was based on the preliminary private consumption estimates of CSO which subsequently was revised to 22 percent.

(January to March), reported consumption of Rabi grains would have been from the rabi crops of 1981-82. For all practical purposes, therefore, one can safely assume that the NSS consumption estimates of foodgrains in 1983 were out of the harvests realised in 1982-83 (July 82 to June 1983).

Since there was a big jump in foodgrain production in 1983-84 over 1982-83 (of about 22 million tonnes), and all of this has been included in the official consumption estimates of 1983-84, the latter is artificially higher than the NSS (1983) estimates by about Rs. 5,000 crores (accounting for about 5 percent of the discrepency between the two estimates) due to foodgrains alone. The same considerations would also apply in comparing the consumption estimates of oilseeds and their products under the two data sources, as the production of oilseeds recorded a big increase of 27% from 10 million tonnes in 1982-83 to 12.7 million tonnes in 1983-84. Keeping in view that the (all agricultural) commodity index rose by about 14 percent in 1983-84 over 1982-83 and assuming that most of the NSS consumption of agricultural commodities and related products in 1983 would be from the 1982-83 crops, it appears that the discrepency between the official and the NSS consumption estimates would be roughly around 12 percent[3] rather than 21 percent—very roughly indeed as many other relevant adjustments have not been made here.

Reconciliation of National Accounts and NSS consumption estimates is a complex problem. It would have been relatively easy to do so if, for all commodities/subgroups, the NSS estimates would have been lower (or higher) than the official estimates by the same proportion. However, this certainly is not the case. For example, the NSS consumption estimates of foodgrains generally have been found higher by 10 percent or more compared with the official estimates in various years. Same is the case with fuel and light sub-group, where NSS estimates are 30 to 40 percent higher than the official figures. Since foodgrains and fuel and light subgroups are necessities in the consumption expenditure of the poor households, any downward adjustment in the NSS consumption estimates of these items (to reconcile with the official estimates) would considerably reduce the consumption expenditure of the poor households and this adjustment, if carried out, might increase the estimated incidence of poverty. NSS estimates of consumption of non-food items such as clothing, durable goods and services, on the other hand, are considerably lower than the official estimates. Carrying out upward adjustments in

[3]It is obtained by comparing the 1983 NSS consumption expenditure estimates with the CSO consumption figures; the latter being comprised of 1982-83 estimates for cereals, pulses, edible oils, sugar and gur, and 1983-84 estimates for the remaining consumption items.

these estimates to reconcile them with the official figures, would certainly increase the NSS estimates of consumpion expenditure. However, most of these increases are likely to belong to the higher income households, which are already above the poverty line. This upward adjustment should, therefore, lead to only marginal increases in the consumption expenditure of the poor households. On balance, the downward adjustment in the observed consumption expenditure on essential items and upward adjustment in non-essential items might result in net decrease in the consumption expenditure of the poor households rather than the increases per the Planning Commission procedure.

It can thus be surmised that detailed commodity/sub-groupwise adjustments in the NSS consumption estimates, in order to reconcile them with the national accounts figures, might lead to still higher estimates of poverty incidence, particularly for the year 1983.

Our comments in regard to the misuse of 1983 data by the Planning Commission are only illustrative of the pitfalls in the computation of poverty. The reconciliation of the estimates of private consumption expenditure, emerging from the two data sources, is a far more difficult exercise. The apparent differences between the two data sets would need to be examined for their varying coverage, for differences in referencs periods, estimation procedures and errors of estimates, implicit prices, etc., before the adjusted results emerge. The real differences, in consequence of the proper adjustment procedure, might turn out to be far less significant. However, this can be established only through a scientific investigation.[3]

3. REVIEW OF CONSUMER PRICE DEFLATORS/INDICES

For working out the poverty incidence the base year poverty line needs to be updated by using a suitable price index/deflator. In this context, as well as for depicting realistic urban and rural price movements, the available implicit price deflators and the consumer price indices (which are aften used as price deflators) are being reviewed here.

The implicit consumer price deflator, based on CSO's series of total private consumption expenditure, is obtained by dividing the figures of the current price series with the corresponding figures of the constant price series. This index, as pointed out earlier, can be obtained only at

[3]An investigation of this problem has been in progress by a joint team of research workers of the Indian Statistical Institute, CSO and NSSO. The results available thus far seem to indicate that the pro-rata uniform adjustment procedure, as practised by the Planning Commission to inflate the observed NSS consumption distribution, for estimating the incidence of poverty, is severely flawed.

the aggregative level for the entire country. Therefore, its use, in working out the incidence of poverty in the rural and urban areas separately, has the limitation that it ignores the differential price movements over time between the rural and the urban areas. Moreover, the way CSO derives the constant price series of private consumption expenditure from the current price series, the implicit price deflator would be a mixture of all available price indices in India, including the wholesale price index.

The other implicit consumer price index is the NSS-based index for cereals prices which can be constructed from the average prices of all cereal items taken together obtained indirectly from the consumer expenditure surveys of different rounds of NSS. Its use, especially in the rural areas, might be recommended on the basis of the fact that cereals constitute a basic necessity in the food basket and account for a major share in the total consumer expenditure for the rural poor [see Bhattacharya *et al.* (1985)]. This implicit index can be worked out for only those NSS rounds, which provide estimates of consumption of all cereal items both in value and quantity. Nonetheless, as a partial index, it would be an inadequate proxy for the representative consumer basket, and we have, therefore, avoided using this index.

Besides these two implicit deflators, the following three consumer price (cost of living) index series, with 1960-61 as base, are readily available for use in the estimation of incidence of poverty :

1. Consumer Price Index for Agricultural Labourers (CPIAL),
2. Consumer Price Index for Industrial Workers (CPIIW).
3. Consumer Price Index for Non-manual Employees (CPINM).

The *CPIAL* is based on the monthly rural retail prices of about 75 items collected from selected rural centres, with the consumption pattern of rural agricultural labour households in 1956-57 as the weighting diagram.

It is worth pointing out that the agricultural labour households (ALH) constitute less than 30 percent of the total rural households. On a cursory examination of some studies, it might be quite realistic to assume that only about 70 percent of the ALH are below the poverty line. The poor ALH would, therefore, comprise only about 21 percent of the total rural population. However, the different estimates of the incidence of poverty in rural India have ranged between 40 to 60 percent of the total population. In other words, there are substantially large numbers of poor rural households, who belong to other occupational groups, such as marginal and small farmers, non-agricultural rural labour, artisans and menial workers, which obviously are excluded from the scope of the CPIAL. This index (CPIAL) cannot, therefore, be expected to represent either the changes

in the cost of living in rural India as a whole, or even the movements in the cost of living of the rural population in poverty. In order to meet these two requirements, one has to look elsewhere; and our suggestions in the matter appear in the next section.

The *CPIIW*, as the name indicates, is the consumer price index for industrial workers and covers households engaged in industrial activities relating to the organised sector. It is based on the monthly consumer prices of about 100 items collected from 50 selected urban industrial centres spread all over the country, and the consumption pattern of urban industrial worker households engaged in the organised sector in 1958-59 as the weighting diagram [see, Labour Bureau (1968)]. Worker households covered here constitute about 26 percent of the entire urban households. In deriving the consumption pattern, it excludes all urban worker households engaged in productive activities in the unorganised sector.

The *CPINM* covers urban non-manual employee households. The index is prepared from the monthly retail prices of about 180 items of goods and services collected from 45 selected urban centres and the consumption pattern obtained from the 1958-59 middle class family living survey [see, CSO (1964)] which was confined to the urban non-manual employee households constituting about 15.5 percent of the entire urban households. The urban *self-employed* households are excluded from this index.

It is worth noting that these two urban price indices (CPIIW and CPINM) depict consumer price movement for two entirely different subgroups of the urban population and neither of them is based on the consumption pattern of the entire urban population. Due to non-availability of relevant data, it is not possible to take into account the consumption pattern of the self-employed households and the worker households engaged in the unorganised sector in the construction of urban price (cost of living) index. However, a combination of the two available indices (CPIIW and CPINM) might be a better approximation for depicting the price changes for the urban population rather than using either one of them alone, or the synthetic private consumption deflator. We have attempted to combine these two indices in a single construct, which is discussed in the next section.

We are in urgent need of two new urban cost of living indices : one to depict the changes in the cost of living of the entire urban population and another to represent the movements in the cost of living of the urban population in poverty. A study has been initiated to work out an all-urban consumer price index, using the already available urban retail prices collected for CPIIW and CPINM and the NSS based all-urban consumption pattern as the weighting diagram. For the purpose of estimating the incidence of urban poverty, we propose to recompute this

index by taking into account the consumption pattern of only those groups of urban population whose inclusion or exclusion from poverty is sensitive to shortrun variations in prices, production and employment. However, the results of these two exercises would be presented at a later occasion.

4. Alternative Consumer Price Indices

4.1 *Rural Consumer Price Indices*

We have constructed two new rural price indices, one for depicting the price movement for the entire rural population and the other for the middle rural population, which we consider relevant for computing the rural poverty incidence. These are discussed below.

(*a*) *Consumer Price Index for the Entire Rural Population* (*CPITR*). To depict the movement of consumer prices for the entire rural population we have constructed a new index, using rural retail prices and the consumption pattern of the entire rural population. The NSS regularly collects monthly rural retail prices of about 75 food as well as nonfood items from a set of 422 selected villages sperad all over the country. The number of villages in this on-going regular enquiry will soon be expanded to 1000. The all India monthly average retail prices for these items are published by the CSO in their publications, *Monthly Abstract of Statistics*. In working out the CPITR, we have used the NSS Consumption pattern of rural India for combining the itemwise prices. The details of these computations are as follows :

(i) NSS rural consumption expenditure by broad groups of items in 1970-71 is used for deriving group weights.
(ii) Individual itemwise detailed consumption pattern for 1970-71, however, was not available in the tabulated form. Nevertheless we were able to have access to these details for 1973-74. The group weights derived from 1970-71 data have been subdivided by us into individual itemwise weights by using 1973-74 detailed itemwise tabulation.
(iii) The itemwise price relatives are computed with July 1970-June 1971 as the base for different NSS survey periods.
(iv) The overall rural consumer price index for different NSS survey periods is worked out by taking the weighted average of itemwise price relatives, the weights being as indicated in (i) and (ii) above.

This new rural consumer price index, constructed in the manner just

explained, can be considered fairly representative, as the items for which retail prices are available account for nearly 75 percent of the total rural consumption expenditure. The remaining 25 percent of the expenditure is distributed over the relevant groups where it belongs. For example, the expenditure weight of durable items, for which prices are not available, is allocated to the other durable items in the group whose prices are available.

(*b*) *Consumer Price Index for Middle Rural Population* (*CPIMR*) *and its Relevance in Poverty Estimation.* It is probably needless to point out that while CPITR is a far better index of rural price movements than the CSO's implicit deflator, nevertheless it may not succeed in reflecting accurately the changes in the cost of living of the rural poor. The inadequacy of the CPIAL for this purpose has already been commented upon. The numbers of agricultural labour households in poverty are much less than the numbers of the rural poor belonging to other occupational groups, such as small and marginal farmers, other rural labour, artisans and menial workers. Faced with this siiuation, one could conceive of a rural consumer price (cost of living) index based on the observed consumption pattern of all these occupational groups as well as agricultural labour. Nevertheless, the relevant sampling design, which might capture the consumption pattern of *only* these diverse occupational groups, would have to be not only extremely complex but also very costly to implement.

Another suggestion that has often been made is that one should construct an index of consumer prices for the lowest X percent (X being the percentage of people below the poverty line) of the consumers in the consumption distribution and use this index for updating the poverty line over time. Methodologically speaking this is not a sound suggestion. The proportion of the people below the poverty line is a variable entity, which itself is the very object of poverty measurements. The weighting diagram for the yardstick (index) to calibrate the poverty norm over time is better kept independent, as far as possible, of the consequences arising out of the process of measurement.

In our view, these methodological problems as well as the massive requirements of fresh data can be easily bypassed. Currently available poverty studies (including our own) indicate that no matter what price deflator is used for updating the base year poverty line, the top 40 percent of the rural population are always above the poverty line and the bottom 30 percent are always under the poverty line. There is a broad band in the middle, constituting about 30 percent of the rural population (approximately from the 30th to 60th percentile of the distribution), large chunks of which either come into poverty or get excluded from poverty depending on the price, production and employment conditions in a particular

year. In other words, this broad band in the middle covers households from all occupational groups to which a sizable proportion of the poor belong; and it is their exclusion or inclusion which mainly governs the year to year changes in the estimates of the overall incidence of rural poverty. Thus, both in concept and fact, the consumption pattern of this middle band of households should provide the relevant weighting diagram for the construction of the appropriate rural consumer price index for the estimation of rural poverty. We have, therefore, constructed a new price index, which is based on observed rural retail prices (same as used for CPITR) and the 1970-71 consumption pattern of approximately three middle deciles of households (falling in the two expenditure classes of Rs. 24 to Rs. 28 and Rs. 28 to Rs. 34 and accounting for 31st to 60th percentile of the rural population).

The weighting diagrams in terms of broad groups of items used for constructing the two new rural price indices (CPITR and CPIMR) are given in the Appendix Table A-I. It may be noted here that these new rural price indices could not be constructed for the period prior to 1970-71 as the all India average rural retail prices for 75 consumption items are not available in published form for the earlier period. We present in Table 1 the two new rural price indices (CPITR and CPIMR) along with the CPIAL for five different NSS rounds covering the period from 1970-71 to 1983-84, with 1970-71 as the base. Table 1 also presents the implicit price deflators based on the CSO's private consumption expenditure

TABLE 1
RURAL CONSUMER PRICE INDICES AND IMPLICIT DEFLATORS

NSS round	*Survey Period*	*Consumer Price Index*			*Implicit deflator*	
		Entire population (CPITR)	*Middle percentiles only (CPIMR)*	*Agriculture labour (CPIAL)*	*CSO's Pvt. consumption expenditure (all India)*	*NSS average price of cereals (Rural population)*
(0)	(1)	(2)	(3)	(4)	(5)	(6)
25	July 70—June 71	100.0	100.0	100.0	100.0	100.0
27	Oct. 72—Sept. 73	125.1	127.7	122.9	116.8	128.4
28	Oct. 73—June 74	151.8	155.8	151.6	139.0	167.5
32	July 77—June 78	177.1	175.1	168.6	171.5	162.1
38	Jan-December 1983	284.2	282.4	267.0	288.4	—

and the estimated average price of cereals from NSS. It is interesting to note that both the new price indices (CPITR and CPIMR) compared to CPIAL show higher price movements overtime, especially in 1977-78 and in 1983. It may also be noted that the price movement over time of CPITR is different from that of CPIMR—slightly lower upto 1973-74 but slightly higher afterwards. The movement of the NSS based cereal price deflator for the entire rural population, compared to our new rural indices is on the higher side upto 1973-74, but substantially on the lower side in 1977-78.

4.2 *Urban Consumer Price Indices*

Owing to the non-availability of all-India urban average retail prices, it is not possible to construct a price index for urban areas similar to the one prepared for the entire rural population. However, as mentioned earlier, we have constructed a new urban consumer price index by combining the CPIIW and CPINM by attaching proper weights to the two indices. The weights could either be the total number, or the aggregate consumption expenditure, of the households covered by the two specific indices : We have adopted the latter course. These weights have been derived by multiplying the estimated total number of industrial worker households and the middle class non-manual employee households with their respective average monthly household consumption expenditure. The weights, used for combining the CPIIW and the CPINM, turn out to be 37.5 and 62.5 percent respectively.[4] The families covered by the

[4]In combining CPIIW and CPINM, the weights used are in proportion to the estimated aggregate consumption expenditure of all urban families of the relevant class intended to be covered separately under each of the two indices. The estimated aggregate consumption expenditure of all urban families of class (i), denoted as C_i $i = 1$ or 2, depending upon whether the reference is made to Industrial working class (CPIIW) or Middle Class (CPINM) families, is obtained from the relation :

$$C_i = X_i\ (Y_i/Z_i)$$

X, Y and Z are defined as follows :

X_i = monthly total consumption expenditure of families of class (i) belonging to the urban centres covered under the relevant Family Living Survey relating to class (i).

Y_i = estimated number of families of class (i) in urban India as a whole.

Z_i = estimated number of families of class (i) in the specific number of urban centres covered under the relevant survey.

The estimates of X, Y and Z, obtained from the two survey reports, viz. *Family*

Footnote 4 (*contd. on page* 31)

new combined price index (hereafter referred to as CPICU) constitute about 42 percent of the entire urban family population. The CPICU may be regarded to be relatively better than either the CPIIW or the CPINM for depicting the retail price movements over time for the urban areas of India.

Table 2 gives the combined urban consumer price index along with CPIIW and CPINM for various NSS survey periods and also the CSO's implicit consumption deflator.

TABLE 2
URBAN CONSUMER PRICE INDICES

NSS round	*Survey period*	*Consumer Price Index*			*Implicit CSO deflator (all-India)*
		IW	*NM*	*CU*	
(0)	(1)	(2)	(3)	(4)	(5)
25	July 70—June 71	100.0	100.0	100.0	100.0
27	Oct. 72—Sept. 73	120.2	116.3	117.7	116.8
28	Oct. 73—June 74	158.5	135.1	144.2	139.0
32	July 77—June 78	174 9	170.5	172.3	171.5
38	Jan.—Dec. 83	285.4	274.2	278.6	288.4

The price movements in the rural and the urban areas may be compared with the help of the CPITR [col. (2) of Table 1] and CPICU [col. (4) of Table 2]. In all the years corresponding to the different NSS rounds from 27th to 38th round, the price indices with 1970-71 as the base are consistently lower for the urban areas than those for the rural areas. The changes in prices in the different years, with 1970-71 = 100, were 5 to 8

Footnote 4 (*contd. from page* 30)
Living Survey of the Industrial Workers, 1958-59 and Middle Class Family Living Survey, 1958-59, are given below :

Survey	*X* Rs. (million)	*Y Families* (million)	*Y Families* (million)	*C* Rs. (million)
Industrial workers	146.70	4.18	1.29	476.63
Non-Manual Employees	260.02	2.50	0.82	793.65

percentage points steeper in the rural areas than in the urban areas. However, if the base year is changed from 1970-71 to any other year, the comparative picture of price movement over time in the rural and the urban areas gets reversed. For instance the change in prices in the urban areas, in comparison with the rural areas, for the years 1977-78 and 1983, respectively, turn out to be higher by 5 and 9 percentage points when 1972-73 is taken as the base year and 3 and 6 percentage points higher if the base year is taken as 1973-74.

In comparison with CSO's implicit price deflator, the new price indices show much steeper rise in prices upto 1973-74, the relative rise narrows down in 1977-78 and the absolute levels in 1983-84 are lower than the corresponding level of the CSO deflator.

It should be noted that (i) CSO's deflator refers to the financial year, i.e. April to March, whereas the consumer price indices presented here refer to the NSS survey periods which are different from the relevant financial years; (ii) the NSS consumer expenditure distribution data are the only available source for estimating the incidence of poverty separately for the rural and the urban areas, and (iii) the CSO's deflator relates to the whole country and thus ignores differential price movements over time between rural and urban India. In view of these facts, it seems more appropriate to use consumer price indices (constructed from observed data), relevant to the various individual NSS survey periods, rather than CSO's implicit deflator referring to financial years.

In making comparisons between the price movements experienced in the rural and urban areas, the choice of the base year is obviously important. Nevertheless, we must note that this choice of the base year does not affect the estimates of the incidence of rural and urban poverty, when they are made separately and each of them is based on its relevant and distinct price index.

5. INCIDENCE OF POVERTY

5.1 Updated Poverty Lines

For computing poverty incidence the Planning Commission has used the rural and urban poverty lines of Rs. 49.09 and Rs. 56.64, respectively, as the minimum per capita consumption expenditure per month at 1973-74 prices. Starting with these as the base poverty lines, and using the newly constructed rural-urban price indices presented in Tables 1 and 2, we have worked out the corresponding poverty lines for the five different NSS survey periods. To facilitate comparisons, the up-dated poverty lines for the same NSS periods are also derived by using CPIAL for rural population. CPIIW for urban population and CSO deflator, both for urban and rural population. These are given in Table 3.

TABLE 3

CONSUMER PRICE INDICES (1973-74 = 100) AND POVERTY LINES (PL) FOR DIFFERENT NSS ROUNDS

NSS round	Survey Period	Rural						Urban				CSO		
		CPITR		CPIMR		CPIAL		CPICU		CPIIW		Deflator	PL (Rs.)	
		Index	PL (Rs.)	Index	PL (Rs.)	Index	PL (Rs.)	Index	PL (Rs.)	Index	PL (Rs.)		Rural	Urban
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
25th	July 70-June 71	65.9	32.34	64.2	31.52	66.0	32.38	69.3	39.28	63.1	35.75	71.9	35.32	40.75
27th	Oct. 72-Sept. 73	82.4	40.45	82.0	40.25	81.1	39.79	81.7	46.29	75.9	42.98	84.0	41.25	47.59
28th	Oct. 73-June 74	100.0	49.09	100.0	49.09	100.0	49.09	100.0	56.64	100.0	56.64	100.0	49.09	56.64
32nd	July 77-June 78	116.7	57.26	112.4	55.18	111.2	54.59	119.5	67.66	110.4	62.53	123.4	60.57	69.88
38th	Jan.-Dec. 83	187.3	91.92	181.3	89.00	176.1	86.46	193.2	109.43	180.2	102.04	207.5	101.85	117.52

5.2 Poverty Incidence : 1970-71 to 1983

Making the realistic assumption that per capita total consumer expenditure follows the log-normal law both for the rural and the urban areas of India, a linear relation holds between log x and t_p, where x is the per capita total expenditure and t_p stands for probit or abscissa upto which the area under the standard normal curve is p, and p is the proportion of population with per capita total expenditure less than or equal to x. Therefore, using linear interpolation between log x and t_p, the incidence of poverty i.e. percentage of population below the given poverty line, is worked out corresponding to each of the poverty lines given in Table 3. These estimates of poverty incidence and the absolute numbers of poor, separately for rural and urban areas are given in Table 4.

Examination of poverty incidence under different alternatives reveals the following interesting points about poverty in India :

(1) Irrespective of the choice of the particular price index, the rural poor seem to account for more than 80 percent of total poor in the country. Thus, even if our new urban price index (used to update the base year urban poverty line) is not considered fully satisfactory, the estimate of over-all poverty incidence might not be seriously deviant if rural poverty is computed by using an appropriate rural price index (like CPIMR).

(2) Inspite of the decline in poverty incidence during 1970-71 to 1983, the absolute number of persons in poverty showed an increase under all alternatives (except CPIAL for rural). We have, nevertheless, pointed out in Section 3 that CPIAL is not an appropriate index to compute rural poverty incidence.

(3) The increase in absolute numbers of the poor, during 1970-71 to 1983, was substantially larger in urban areas than in the rural areas—between 28 to 40 percent in urban India as compared with 7 to 14 percent increase in rural India. This needs to be further looked into in order to identify the factors responsible for such an high increase in the numbers of the urban poor. Prima facie, the migration of the rural poor to urban areas might be an important factor.

In Table 5 we present two all-India pictures of the incidence of poverty and the absolute numbers of persons below the poverty line in different NSS survey periods. Alternative I corresponds to the use of CPIMR and CPICU. In alternative II, we have used CPIAL and CPIIW (both readily available but partial in coverage) for working out the combined all-India poverty incidence. Under both alternatives, the poverty

TABLE 4

POVERTY INCIDENCE AND ABSOLUTE NUMBERS OF THE POOR USING DIFFERENT POVERTY LINES

NSS rounds	Survey Period	Rural								Urban					
		CPITR		CPIMR		CPIAL		CSO deflator		CPICU		CPIIW		CSO deflator	
		%	mln. nos.	%	mln. nos.	%	mln. nos.	%	mln. nos.	%	mln. nos.	%	mln. nos.	%	mln. nos.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
25th	July 1970-June 1971	55.7	241	53.4	231	55.4	239	62.8	271	46.4	50	39.7	43	48.8	53
27th	Oct. 1972-Sept. 1973	57.8	260	57.4	258	56.5	254	59.4	267	45.4	53	39.9	47	47.4	56
28th	Oct. 1973-June 1974	56.4	258	56.4	258	56.4	258	56.4	258	49.5	60	49.5	60	49.5	60
32nd	July 1977-June 1978	54.0	265	51.5	253	50.1	246	58.6	288	42.4	60	36.6	52	44.9	64
38th	Jan.-Dec. 1983	48.0	263	45.3	248	42.9	235	56.5	310	36.8	65	31.6	50	42.3	74
1983 as % of 1970-71		—	109	—	107	—	98	—	114	—	130	—	128	—	140

TABLE 5
COMBINED ALL INDIA INCIDENCE OF POVERTY

NSS round	*Survey Period*	*Alternative I*		*Alternative II*	
		%	*No. (million)*	%	*No. (million)*
25	July 70—June 71	52.0	281	52.3	283
27	Oct. 72—Sept. 73	54.9	311	53.0	301
28	Oct. 73—June 74	54.9	318	54.9	318
32	July 77—June 78	49.5	314	47.0	298
38	Jan.—Dec. 83	43.2	313	40.2	291

incidence appeared to remain around 52-55 percent upto 1973-74. It then declined by 5 and 8 percentage points, respectively, under alternatives I and II in 1977-78; and declined further by about 6 and 7 percentage points between 1977-78 and 1983. The preferred alternative I, based on CPIMR and CPICU, shows about 3 percentage points higher incidence of poverty in 1977-78 and 1983 in comparison to Alternative II, which is based on the price indices relating only to the rural agricultural labour and the urban industrial workers in the organised sector.

It must be noted that inspite of the fall in the proportion of the poor in total population under both the alternatives, the actual number of persons below the poverty line has not shown any decline between 1970-71 and 1983. In fact, the numbers of the poor increased by about 11 percent, from 281 million in 1970-71 to 313 million in 1983 under alternative I, and by about 3 percent from 283 million to 291 million under alternative II.

5.3 *Official Estimates of Poverty and Consequences of Adjustments to Observed Distributions of Consumer Expenditure*

The Seventh Five Year Plan document provides estimates of poverty separately for rural and urban India for 1977-78 and 1983-84: [see Planning Commission (1985)]. These estimates are based on the following data sets and assumptions :

(*a*) The poverty line is taken as the minimum monthly per capita consumer expenditure of Rs. 49.09 in rural and Rs. 56.64 in urban areas at 1973-74 prices.

(*b*) In updating the poverty line from 1973-74 to other years, CSO's implicit deflator from total private consumption expenditure is used.

(*c*) The average per capita expenditure and the observed size distributions of consumer expenditure obtained in the NSS rounds are inflated and shifted horizontally to the right by using adjustment factors (constant and uniform for all fractiles in a year), obtained by dividing the total private consumption estimates of the CSO with total consumer expenditure estimates of the NSS in the relevant rounds.

Using the procedure of the Planning Comission, i.e. assumptions (*a*) to (*c*) above, we have estimated the incidence of poverty in India between 1970-71 and 1983-84. These estimates (which might be called official estimates) are presented in cols. 4 to 7 of Table 6.

The pro-rata adjustment done by the Planning Commission totally voilates the distributional aspects of the NSS consumer expenditure survey data. The adjustment procedure simply amounts to increasing the estimated expenditure of each group by the same fixed proportion, thereby shifting the NSS expenditure distribution horizontally to the right such that its new overall mean becomes the same as given by the CSO data. Since the poverty line remains fixed, this adjustment procedure, which completely ignores the differential distributional aspects of consumption behaviour over different commodity groups forming the consumption basket, obviously results in artificially pulling a large group of persons above the poverty line who are below the poverty line on the basis of observed data prior to the above said pro-rata adjustment. This point is highlighted when the results in Col. 8 to 11 of Table 6 are compared with Cols. 4 to 7. In consequence of this aggregative and artificial adjustment, the poverty incidence in 1977-78 gets reduced from 55.5% to 48.6%; and from 53% to as low as 37% in 1983-84.

In Table 6, for the sake of easy comparisons, we have also indicated in Cols. 12 to 15 our computations of the incidence of poverty based on the preferred alternative procedure, which uses the 1973-74 poverty line(s) defined by the Planning Commission but makes use of the directly observed NSS consumer expenditure distributions (without any changes) and our new, appropriately constructed consumer price indices, CPIMR for rural and CPICU for urban areas. The results on Cols. 12 to 15 are totally unadulterated as neither the consumption distributions have been adjusted, nor the synthetic implicit deflator has been used to adjust for price changes. Comparing Col. 10 with Col. 14, the estimates of the incidence of poverty based on the use of appropriate price indices, rather than the CSO deflator, are lower by 8.0 and 9.8 percentage points respect-

TABLE 6

INCIDENCE OF POVERTY BASED ON THE PLANNING COMMISSION PROCEDURE WITH OR WITHOUT PRO-RATA ADJUSTMENT AND USING NEW CONSUMER PRICE INDICES ALONG WITH UNADJUSTED NSS DISTRIBUTION FOR ALL-INDIA RURAL, URBAN AND COMBINED : 1970-71 TO 1983

NSS round	*Survey Period*	*CSO's implicit deflator*	*Prorata-adjustment factor (%age)*	*Incidence of Poverty*											
				With adjustment factors and CSO deflator				*Without adjustment but with CSO deflator*				*Unadjusted NSS distribution with new consumer price indices CPIMR and CPICU*			
				Rural	*Urban*	*All-India*		*Rural*	*Urban*	*All-India*		*Rural*	*Urban*	*All-India*	
				%	%	%	*No. (mln.)*	%	%	%	*No. (mln.)*	%	%	%	*No. (mln.)*
(0)	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*	*(13)*	*(14)*	*(15)*
25th	July 70—June 71	71.94	112.4	57.0	42.9	54.2	293	62.8	48.8	60.0	325	53.4	46.4	52.0	281
27th	Oct. 72—Sept. 73	84.03	102.4	57.4	46.0	55.0	312	59.4	47.4	56.9	323	57.4	45.4	54.9	311
28th	Oct. 73—June 74	100.00	104.5	52.6	45.8	51.2	297	56.4	49.5	54.9	318	56.4	49.5	54.9	318
32nd	July 77—June 78	123.38	109.0	51.5	38.4	48.6	308	58.6	44.9	55.5	352	51.5	42.4	49.5	314
38th	Jan.—Dec. 83	207.48	121.4	40.5	26.7	37.1	269	56.5	42.3	53.0	384	45.3	36.8	43.2	313

ively in 1970-71 and 1983-84. The implicit deflator from CSO's private consumption expenditure (col. 2 Table 6) has moved very differently in the period 1970-71 to 1983-84 as compared with CPIMR and CPICU (See Table 3).

We have also computed rural poverty incidence by using CPITR for updating the 1973-74 poverty line which is presented in Table 9 (Combination—I). The estimates of poverty incidence based on CPITR are slightly higher than the ones obtained when CPIMR is used.

6. Sensitivity Analysis of the Estimates of Poverty Incidence

At the risk of being accused of labouring the obvious, we wish to pull together different aspects of our results presented thus far in this paper to demonstrate conclusively how different estimates of the incidence of poverty do emerge for the same year (round of the NSS survey) when different combinations of the following three contributory factors are used in the calculations :

(*a*) Poverty line norm—minimum level of per capita expenditure which is taken to define the poverty line at current prices in the base year.
(*b*) Price index/deflator used for updating the poverty line to different years.
(*c*) Pro-rata adjustment made to the observed size distribution of total expenditure.

The separate impact of each of these three factors on the incidence of poverty can be worked out by keeping the other two factors constant turn by turn. In so doing, the difference between alternative estimates of the incidence of poverty for the same year can be decomposed into three components, where each component shall represent the response to change in one contributory factor when the other two factors are held constant.

In Table 7 are presented four different combinations of the three contributory factors. Presented in Table 8 are the relevant magnitudes, in appropriate units, of two alternative poverty lines, PL-1 and PL-2, in 1973-74 prices, index values of the two new price indices, CPITR and CPICU, the CSO deflator and the scalar values of pro-rata adjustment factors for shifting the observed size distribution of total consumer expenditure over the period 1970-71 and 1983. The information contained in Tables 7 and 8 forms the input for the calculations presented in Table 9.

Let us notice that the four combinations of the three contributory factors in Table 7 are so constructed as to make any two adjacent combinations differ from each other in respect of one and only one factor.

TABLE 7
FOUR COMBINATIONS OF THREE FACTORS AFFECTING POVERTY

Factors	*Combination*							
	I		*II*		*III*		*IV*	
	rural	*urban*	*rural*	*urban*	*rural*	*urban*	*rural*	*urban*
Poverty line base	PL-1	PL-1	PL-2	PL-2	PL-2	PL-2	PL-2	PL-2
Price deflator	CPITR	CPICU	CPITR	CPICU	CSO deflator	CSO deflator	CSO deflator	CSO deflator
Pro-rata adjustment	not made	not made	not made	not made	not made	not made	made	made

TABLE 8
ACTUAL VALUES OF THE VARIOUS FACTORS USED IN THE FOUR COMBINATIONS : ALL-INDIA RURAL AND URBAN AND IN EACH NSS PERIOD FROM 1970-71 TO 1983

Year	*Per capita per month (Rs.)*				*CPITR*	*CPICU*	*CSO deflator*		*Adjustment pro-rata*	
	PL-1		*PL-2*							
	Rural	*Urban*	*Rural*	*Urban*	*Rural*	*Urban*	*Rural*	*Urban*	*Rural*	*Urban*
1970	—	—	—	—	65.9	69.3	71.9	71.9	1.124	1.124
1972-73	—	—	—	—	82.4	81.7	84.0	84.0	1.024	1.024
1973-74	44.18	50.98	49.09	56.64	100.0	100.0	100.0	100.0	1.045	1.045
1977-78	—	—	—	—	116.7	119.5	123.4	123.4	1.090	1.090
1983	—	—	—	—	187.3	193.2	207.5	207.5	1.214	1.214

Using the relevant data of Table 8, we have constructed four different estimates of incidence of poverty corresponding to the four combinations listed in Table 7. These four sets of estimates of poverty are presented in Table 9.

In combination I, we have assumed the poverty line (PL-1) as Rs. 44.18 and Rs. 50.98, respectively, for the rural and urban areas at 1973-74 prices. In the remaining three combinations we have used the poverty line (PL-2) as defined by the Planning Commission, i.e. Rs. 49.09 and Rs. 56.64 for the rural and urban areas at 1973-74 prices. Notice that PL-2 is about 11% higher than PL-1. To repeat, the results in each of the four sets (combinations) differ from each adjacent set in regard to only

one factor. In columns 9-11 of Table 9, the pair-wise differences between combinations II and I, III and II and IV and III are presented. Along any row in columns 9-11, corresponding to any single year, we have indicated the changes (in terms of percentage points) in the estimate of incidence of poverty which are caused by change in poverty line-base, choice of the deflator and pro-rata adjustment to size distribution of expenditure, separately, when the other two factors are held constant.

The obvious results are easily stated : other things remaining the same (i) the higher the minimum cut-off expenditure taken to define the poverty line, or higher the rise in consumer prices as reflected in the price index/ deflator, the higher the estimate of incidence of poverty, and (ii) the higher the pro-rata adjustment factor (used to inflate average per capita consumption and shift horizontally to the right the observed distribution of consumer expenditure), the lower the estimate of incidence of poverty.

In the last three columns of Table 9, we have worked out the percentage changes in the incidence of poverty in consequence of one percent change in one of the contributory factors, when the other two are held constant. This might be called the relative sensitivity index of poverty incidence with respect to the particular factor being changed.

The exact definitions of the three sensitivity indices are as follows :

(i) $S_{PL} = \dfrac{[\text{PI (II)/PI (I)}] - 1}{[\text{PL (II)/PL (I)}] - 1}$, defines the sensitivity index of poverty incidence with respect to change in the poverty line.

(ii) $S_{PD} = \dfrac{[\text{PI (III)/PI (II)}] - 1}{[\text{PD (III)/PD (II)} - 1}$, defines the sensitivity index of poverty incidence with respect to change in the price deflator.

(iii) $S_{PA} = \dfrac{[\text{PI (IV)/PI (III)}] - 1}{[\text{PA (IV)/PA (III)}] - 1}$, defines the sensitivity index with respect to change in pro-rata abjustment factor applied to the observed size distribution of expenditure.

For all-India rural, the values of S_{PL}, S_{PD} and S_{PA} for 1970-71 given in columns 12, 13, and 14 of Table 9, are 1.78, 1.41 and −0.75, respectively. These are obtained from the following respective expressions :

$$\frac{[55.7\%/46.5\%] - 1}{[\text{Rs. } 49.09/\text{Rs. } 44.18] - 1}, \quad \frac{[62.8\%/55.7\%] - 1}{[\text{Rs. } 71.94/\text{Rs. } 65.90] - 1} \text{ and}$$

$$\frac{[57.0\%/62.8\%] - 1}{[1.124/1.001] - 1}$$

All the other values of columns 12, 13 and 14 are analogously derived

TABLE 9

ESTIMATES OF INCIDENCE OF POVERTY AND THEIR SENSITIVITY ANALYSIS WITH REGARD TO POVERTY LINE BASE, PRICE DEFLATOR AND PRO-RATA ADJUSTMENT, ALL INDIA RURAL AND URBAN : 1970-71 to 1983

Year	Poverty incidence (PI)								Increase in PI (in %age points)[1]			Sensitivity index of PI		
	Comb-I		Comb-II		Comb-III		Comb-IV							
	%age	No. mln.	%age	No. mln.	%age	No. mln.	%age	No. mln.	C-II over C-I	C-III over C-II	C-IV over C-III	S_{PL}	S_{PD}	S_{PA}
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
All-India Rural														
1970-71	46.5	201	55.7	241	62.8	271	57.0	246	9.2	7.1	−5.8	1.78	1.41	−0.75
1972-73	49.1	221	57.8	260	59.4	267	57.4	258	8.7	1.6	−2.0	1.59	1 43	−1.35
1973-74	47.4	217	56.4	258	56.4	258	52.6	241	9.0	0.0	−3.8	1.71	0.0	−1.47
1977-78	46.4	223	54.0	266	58.6	288	51.5	253	8.6	4.6	−7.1	1.71	1.48	−1.33
1983	39.3	216	48.0	263	56.5	310	40.5	222	8.7	8.5	−16.0	1.99	1.34	−1.33
												1.76*	1.42*	−1.20*

All-India Urban

1970-71	38.9	42	46.4	50	48.8	53	42.9	47	7.5	2.4	—5.9	1.74	1.38	—0.98
1972-73	37.5	44	45.4	53	47.4	56	46.0	54	7.9	2.0	—1.4	1.90	1.56	—1.06
1973-74	40.8	50	49.5	61	49.5	61	45.8	56	8.7	0.0	—3.7	1.92	0.0	—1.66
1977-78	34.7	49	42.4	60	44.9	64	38.4	55	7.7	2.5	—6.5	2.00	1.81	—1.60
1983	29.1	51	36.8	65	42.3	74	26.7	47	7.7	5.5	—15.6	2.38	2.02	—1.72
												1.99*	1.69*	—1.40*

NOTE : *denotes simple averages of the preceding yearly values in each column.
[1]Comb-II over Comb-I; Comb-III over Comb-II; Comb-IV over Comb-III.

by using the results from Columns 1, 3, 5 and 7 of Table 9 in conjunction with data presented in Tables 7 and 8.

In the rural areas, the average values of the three sensitivity indices S_{PL}, S_{PD} and S_{PA} are 1.8, 1.4, and −1.2, with the corresponding ranges of (1.6 to 2.0), (1.3 to 1.5) and (−0.8 to −1.5), respectively, over the five NSS rounds between 1970-71 and 1983. For the urban areas, S_{PL}, S_{PD} and S_{PA} have average values of 2.0, 1.7 and −1.4, with ranges of (1.7 to 2.4), (1.4 to 2.0) and (−1.0 to −1.7), respectively.

The principal upshot of this detailed sensitivity analysis has been to show that each of the three contributory factors (which have been used by different research workers and the Planning Commission in different combinations) produce substantial impact on the estimates of poverty incidence. In rural areas, for instance, on an average, based on experience of five rounds of the NSS survey between 1970-71 and 1983, each one percent increase in the consumer price index has increased poverty incidence by 1.4 percent[5] and each one percent increase in mean per capita expenditure, achieved by pro-rata adjustment of the observed consumer expenditure distribution, has artificially pulled down the incidence of poverty by 1.2 percent.

Our analysis highlights the urgent necessity of making very judicious selection of the three basic factors : The poverty line norm must be defined with care and in updating the poverty lines, we must use appropriately constructed cost of living (consumer price) indices to incorporate price changes. These consumer price indices must incorporate weights relating to a recent period and reflect the consumption pattern of the appropriate population group. Implicit deflators and price indices relating to only certain sections of society, or comprising only a portion of the consumption basket, are not suited to the estimation of country-wide incidence of poverty, as this incidence in fairly wide-spread in India and cuts across groups and classes defined on the basis of criteria and considerations relevant to other specific purposes.

Adjusting the 38th round (1983) NSS consumer expenditure distribution data by using a uniform multiple of 1.21, both for the rural and urban areas, incidence of poverty in rural India, for instance, gets lowered in the Planning Commission procedure by 16 percentage points. Without the adjustment, 56.5% of the rural population would have been computed

[5]We must caution the reader that this parametric statement, regarding the change in the (computed) incidence of poverty in response to change in prices, is *not* intended to convey any behavioural connotation. The statement is true only in a strict accounting sense: For, corresponding to any two different vectors of consumer prices, there would have been two different vectors of observed consumer expenditures, whereas we have computed the consequences for poverty incidence of the two alternative representations (indexes) of the price set on the sameconsumer bundle.

to be under the poverty line, whereas with this adjustment the estimate was put at 40.5%. As noted earlier, the use of the same CSO deflator for updating the poverty line, both in rural and urban areas, raises the estimates of poverty as against the case when proper consumer price indices are used. For rural India in 1983, the use of CSO deflator, artificially raised the estimate of poverty by 8.5 percentage points. In the net, the incidence of poverty in rural India in 1983 has been underestimated by 7.5 percentage points : as against our CPITR based estimate of 48.0%, the Planning Commission procedure puts it at 40.5%. Let us recall that we have argued in favour of the use of the CPITR in place of the implicit CSO deflator for accurate reflection of changes in rural retail prices. Nevertheless, in the estimation of the incidence of rural poverty, we have recommended the use of CPIMR (in preference to CPITR) for updating the poverty line. Making use of the CPIMR which we consider conceptually robust and more appropriate, the estimate of poverty in rural India comes to 45.3% in 1983 as against the Planning Commission's estimate of 40.5 percent.

7. Some Concluding Remarks, Recommendations and Surmises

The adoption of separate norms for rural and urban poverty, in a common base year, makes good sense both in theory and fact. As the availability of different items and their prices are likely to differ between the rural and urban consumers, the composition of the two representative consumer baskets would also tend to differ. While updating poverty norms over time, it is essential to pay close attention both to the representativeness of the respective baskets as well as to the differential movements in consumer prices between the rural and urban areas.

Planning Commission's practice of using the same deflator (CSO's implicit deflator) for updating the two poverty lines, completely ignores the differentials in consumer price movements between the urban and rural areas over time. The use of sectional price indices, such as CPIAL for the rural sector and CPIIW for urban areas, on the other hand, vitiates the estimates of poverty incidence as these indices relate only to small fractions of the relevant populations; whereas incidence of poverty in India cuts across all occupational groups and sections of the population.

In an effort to remove the above-noted defects, we have constructed three new consumer price indices, CPIMR and CPITR for rural India and CPICU, which is a weighted combination of the separate consumer price indices for industrial workers and non-manual employees, for urban areas. We are satisfied with CPIMR and CPITR, both in regard to their representativeness and the availability of direct observations on rural

retail prices needed in their construction. However, the situation with regard to CPICU is less satisfactory. Although the latter is more representative and hence better than most urban indices available thus far which can be used for adjusting urban consumption expenditure for price changes, nevertheless it covers only about 42% of urban households. We are not happy with the use of CPICU in the estimation of urban poverty, though it is better than the other available indices.

Enough has been said in this paper about the relevance of appropriate consumer price (cost of living) indices for updating the poverty lines, and their impact on the estimates of poverty incidence has been amply demonstrated. We have also argued how inappropriate it is to use either the same CSO deflator or certain consumer price indices which relate only to certain specific sections of rural and urban India.

The Planning Commission has been carrying out pro-rata adjustments to jack up the NSS estimates of aggregate private consumption to the level of CSO estimates. In recent years this adjustment has been particularly large, resulting in big shifts in the observed consumer expenditure distribution to the right and thereby artificially reducing the poverty incidence substantially. This procedure completely ignores the widely differential distributional aspects of consumer behaviour on the composition basket and is, therefore, highly questionable. There is a crying need for a detailed study to examine the discrepancies between the NSS and the national accounts estimates of commodity-wise consumption expenditure. In the absence of this detailed examination, which may suggest ways to reconcile the two sets of data, it is better to use the unadjusted consumer expenditure distributions as directly observed in the relevant NSS rounds.

We have made a beginning with an exercise of this sort and our limited results available thus far do not suggest a simple procedure to reconcile the two. However, a lot more work needs to be done and we should welcome others to join in this effort.

As against the estimates of incidence of poverty according to the Planning Commission procedure, our estimates based on the use of CPIMR and CPICU, are marginally lower for 1970-71, almost the same in 1972-73, slightly higher in 1973-74 and 1977-78 but substantially higher in 1983-84. For example, the actual numerical values in 1983-84 are as follows :

	Planning Commission		*Our Estimate*	
	% age	*No. (mln)*	*% age*	*No. (mln)*
Rural	40.5	222	45.3	248
Urban	26.7	47	36.8	65
Combined	37.1	269	43.2	313

As indicated earlier, we have been able to refine our estimates of rural poverty even further by using CPIMR in place of CPITR. Nevertheless, for certain comparative purposes, CPITR-based estimates are of considerable relevance. The incidence of poverty in rural India in 1983, based on CPITR and CPIMR, lie between 48.0% (263 million) and 45.3% (248 million) rather 40.5% (222 million) estimated by the Planning Commission.

On the basis of our computations for the five rounds of the NSS between 1970-71 and 1983, particularly from the results of sensitivity analysis, we are led to the following surmises :

1. The incidence of poverty in 1983 in terms of proportion of people below the poverty line was substantially lower than the corresponding estimates for the 1970s. However, this fall in 1983 was significantly less than what the estimates of the Planning Commission would make us believe. Furthermore, the only fall in absolute numbers below the poverty line according to the Planning Commission estimates (269 million in 1983 as against 293 million in 1970-71), disappears when the estimation is done using appropriate price indices and data sets (the numbers below the poverty line in 1983 work out to be somewhere between 313-328 million as against 291 million in 1970-71).
2. The incidence of poverty does go down in years of good harvests and bounces back up in bad agricultural years. This confirms similar findings reported by us earlier [see, Minhas (1970) and (1971)].
3. From the accounting framework of sensitivity analysis, we can state that between any two index representations of the price set, for every one percent differential increase in the chosen index representation, the estimate of the incidence of poverty goes up by more than one percent (on an average by 1.4% in rural and 1.7% in urban India).
4. We can further surmise that a uniform one percent increase in per capita consumption for all classes on an average, other things remaining the same, would lead to reduction in incidence of poverty by more than one percent (1.2% in rural and 1.4% in urban India).

In conclusion, we wish to reiterate that the point-estimates of poverty incidence are crucially dependent on the choice of the base-line poverty norm, the price indices used in updating the poverty line and the extent of tinkering done with the observed consumer expenditure distribution. Utmost scientific care must be exercised to make judicious selection of

the relevant consumer price indices and appropriate data sets, based on direct observations, to the maximum extent possible, rather than on derivative information and synthetic statistics.

REFERENCES

Bhattacharya, N. *et al.* (1985). *Relative Price of Food and the Rural Poor—The Case of India.* Economic Research Unit, Indian Statistical Institute, Calcutta (Mimeographed).

Minhas, B. S. (1969). *Fourth Plan : Objectives and Policy Frame*, published on behalf of *Commerce* by Vora and Co., Bombay, pp. 56-62.

Minhas, B. S. (1970). 'Rural Poverty, Land Redistribution and Development Strategy, *Indian Econamic Review*, Vol. 5 (New Series), 97-126.

Minhas, B. S. (1971). 'Rural Poverty and Minimal Level of Living : A Reply', *Indian Economic Review*, Vol. 6, (New Series), 69-77.

Mukherjee, M. (1969). *National Income in India, Trends and Structure*, Statistical Publishing Society, Calcutta, pp. 34-35.

Mukherjee, M. and Chatterjee, G. S. (1972). 'On the validity of NSS Estimates of Consupmption Expenditure', *Artha Vijnana*, Vol. 14, June 1972.

Planning Commission (1985). *The Seventh Five Year Plan*, Vol. 1, October 1985, p. 4, Table 1.2.

Tiwari, S. G. (1968). 'Some Aspects of Economic Growth in India, 1950-51 to 1964-65', paper presented at the *Sixth Indian Conference of Indian Association for Research in National Income and Wealth*, Bangalore.

Data Sources

Family Living Survey among Industrial Workers, 1958-59; General Report (1968) Labour Bureau, Ministry of Labour, Employment and Rehabilitation, Government of India.

Monthly Abstract of Statistics, C. S. O., Department of Statistics, Ministry of Planning, Government of India (various issues from August 1970 onwards).

National Accounts Statssttics, C. S. O. Department of Statistics, Ministry of Planning, Government of India (January 1981 and January 1985).

Report on the Middle Class Family Living Survey, 1958-59; Vol. 1 (1964) Central Statistical Organization, Government of India.

Sarvekshana, Department of Statistics, Ministry of Planning, Government of India, (Vol. 1, No. 1, July 1977; Vol. II No. 3, January 1979; Vol. IX No. 3, January 1986; Vol. IX, No. 4, April 1986).

Tables with Notes on Consumer Expenditure, 25th Round, July 1970-June 1971, NSS Draft Report No. 269, National Sample Survey Organization, Department of Statistics, Ministry of Planning, Government of India (August 1975).

APPENDIX

TABLE A 1
PERCENTAGE SHARES OF BROAD GROUPS OF CONSUMER ITEMS IN TOTAL CONSUMPTION EXPENDITURE, RURAL INDIA : 1970-71

Sl. No.	*Name of items*	*All Percentiles*	*Middle percentiles*
1.	Rice	21.9	26.6
2.	Wheat	6.9	8.3
3.	Other cereals	11.4	13.1
4.	Gram	0.6	0.7
5.	Pulses and products	3.8	4.0
6.	Edible Oils	3.6	3.7
7.	Meat, Fish, Eggs	2.9	2.7
8.	Milk and Milk products	8.6	6.5
9.	Fruits and nuts	1.2	0.9
10.	Vegetables	3.6	3.8
11.	Sugar	3.2	2.9
12.	Salt	0.2	0.3
13.	Spices	3.2	3.6
14.	Beverages and refreshments	2.7	2.5
15.	Food—total	73.8	79.5
16.	Pan, tobacco and intoxicants	3.2	3.3
17.	Fuel and light	6.0	6.7
18.	Clothing	7.3	4.2
19.	Footwear	0.7	0.3
20.	Miscellaneous goods and services	8.1	5.8
21.	Durables	0.9	0.1
22.	Non-food total	26.2	20.5

NOTE : Percentiles from the 31st to 60th are referred to as middle percentiles.