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Poverty Decline in India in the 1990's: A Reality and Not an Artifact

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Poverty

POVERTY DECLINE IN INDIA IN THE 1990S : A REALITY AND NOT AN ARTEFACT*

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Doubts have been raised about the comparability of the size distributions and of the poverty measures based on them from the 50th (1993-94) and the 55th (1999-2000) rounds of Consumer Expenditure Surveys (CES) carried out by the National Sample Survey Organisation. We resolve the comparability problems (Section I) by using the unit level records of the 50th round of CES and those relating to consumer expenditure from the employment-unemployment survey (EUS) of the 55th round. In particular, we show that the estimated monthly per capita consumer expenditure (MPCE) from the 55th round of CES based on the 30-day recall have not been biased upwards (as maintained by the critics) by an alleged extrapolation by the respondents of their prior responses to questions on the 7-day recall (if the latter were canvassed first) and that therefore they are comparable to the (recalculated) ones from the 50th round estimates.

Using comparable estimates of four measures of poverty and the Sen index at the all-India level (Section II), it is shown that poverty in India has declined in the 1990s in terms of all the five measures of poverty in rural India and in the country as a whole and in urban India on all the measures of poverty except the number of urban poor. Also, normalised for the length of the time interval and the base year levels of poverty measures, the average annual rate of reduction in poverty was higher in the last six years

of the 1990s than that recorded during the ten and a half years period preceding 1993-94. This is so on all the five poverty measures and this difference is particularly significant in respect of the number of poor.

Ces Comparability Problems, Solutions and Implications

The two problems of comparability

The primary and most widely debated problem is that information in the 55th Round CES concerning household spending on a group of frequently purchased food items – comprising 'food, beverages, paan, tobacco and intoxicants' (henceforth referred to as the 'the food groups'[1]) was canvassed on two alternative reference or recall periods of 30-days and 7-days, among the **same set of households**, and recorded on the schedule of enquiry in blocks located side-by-side. While only 30-day reporting was published in the 55th Round CES, critics maintained that this reporting might have been biased upwards if households were first canvassed on the 7-day reference period and they subsequently extrapolated their response on the 7-day reporting to the 30-day entry by rough multiplicative adjustments. If this were indeed true, then there would be strong grounds to believe that the 55th round overstated consumer expenditures on these items in comparison with all the earlier quinquennial rounds. For, one of the key results to emerge from the four 'thin' rounds preceding the 55th Round Survey (51st thru 54th) which canvassed the items in 'food group' on alternative reference periods on independent sets of sample households, was that the estimates based on the 7-day recall were considerably higher than the corresponding estimates based on 30-day recall

Lending credence to the perception that the responses on one reference period had influenced the response on the other reference period is the fact that respective monthly per capita expenditures (MPCE) on the food group from the 7- and 30-day reference periods converge to an unexpectedly high degree in comparison to the results from the set of four experimental annual, 'thin' rounds of CES conducted prior to the 55th round.

To illustrate, in the 55th round, the difference between the two estimates (on the 7-day relative to the 30-day recalls) of overall mean per capita expenditure on 'total food' was 6.5 percent and 5.7 percent for the all-India rural and urban population, respectively (NSSO, 2000b). Over the four rounds of annual surveys, however, the corresponding differences averaged 30 percent and 33 percent.

Since the food group dominates the consumption basket of poor households, in the annual surveys, headcount ratios based on the size-distribution of PCTE from the 7-day recall-based reporting were also bout half the magnitude of those based on the 30-day recall (Visaria 2000). In the 55th round, the comparable differential considerably narrowed to 10-12 percent.

The divergence between the 7- and 30-day results in the annual surveys was an expected consequence of two types of possible errors, recall error and telescoping error, which operate on the frequent and less salient expenditures in the food group, respectively. Whereas the former increases with a longer recall period, the latter increases with a

shorter recall period. For this reason both phenomena skew results for the 7- and 30-day recalls in opposite directions (Deaton and Grosh 2000).

The narrowing differential in the 55th round may have arisen as follows: when confronted with having to report consumption for the same list of items, involving frequently consumed items which are non salient events in respondent's memory on two alternative recall periods, the respondents would try to economise on their effort by adjusting their reporting for the second reference period on the basis of a rough extrapolation from the first one.

Accordingly, there are **two possibilities that could result in narrowing the difference** between the 7- and 30-day recalls observed in the 55th round of CES. Possibility 1 (P1) is that the 7-day recall was the first to be canvassed, and that respondents subsequently reported the 30-day equivalent by making a rough multiplicative adjustment. P1 would clearly impart a downward bias in the estimated headcount ratio for 1999-2000 in comparison with the earlier rounds. Hence it would overstate the comparable extent of decline in poverty, as asserted by critics of officially released poverty estimates. If P1 is true for a sizeable proportion of households, the results of the 55th round with respect to the specified items would therefore be non-comparable with respect to all previous NSS rounds.

The other possibility, (P2), is that respondents may have been asked first to recall consumption for the past 30-days, and subsequently reported their consumption during

the previous 7-days by use of crude division[2]. It can easily be seen that either P1 or P2 would produce the narrowed 7- vs 30-day differential observed in the 55th round CES. P1 would bias upwards the reporting for the 30-day recall, whereas P2 would bias downward results for the higher 7-day recall. However, if P2 were true, the results of the 55th round would indeed turn out to be comparable to the 50th round – provided one adjusts the latter for the mixed reference period used in the 55th round.

The second and less widely recognised problem is that, in the 55th round, consumer expenditure on certain infrequently purchased items, namely 'clothing', 'footwear', 'durables', 'education' and 'health care' (ínstitutional), was collected only on a 365-day reference period. The published results for all remaining items were based on a 30-day reference period. Accordingly, in the published results, the size-distribution of monthly per capita total expenditure (PCTE) as per the NSS 55th round consumer expenditure survey for 1999-2000 are based on a mixed reference period (MRP). In contrast, the published size-distribution of PCTE from the NSS 50th and all the earlier rounds are based on data collected with a uniform reference period (URP) of 30-days for all items of expenditure. In particular this was also true for the published results of all the quinquennial surveys carried out earlier in 1972-73, 1977-78, 1983 and 1987-88.

These comparability problems are, however, not intractable.

A Resolution of the 7-day/30-day Problem

We resolve the 7-day/30-day problem by showing that the reported consumer expenditure

on the food group collected in the 55th round of CES indeed reflected 30-day recall. To establish this we compare the CES results with consumer expenditure data from the 55th round's employment-unemployment survey (EUS) which was canvassed on an *independent sample of households* distinct from those in CES but from the same universe of population and *used only 30-day recall period* for items in the food group and a 365-day recall period for the above-listed infrequently purchased items. So that, **on this score**, a size-distribution based on the EUS would be comparable to the published 55th Round CES results with a 30-day reference period for the food group. It is then ascertained whether the observed difference between the CES and EUS estimates could be attributed to the possible biases introduced in the CES estimates by the canvassing of the household expenditures on these items on two alternative recall periods. This is done by comparing the CES-EUS differential with the corresponding average differential in the estimates of consumer expenditure of these items emerging from independent schedules with 7- and 30-day recall periods canvassed on independent samples during the experimental annual CES surveys conducted from the 51st to the 54th rounds of NSS.

However, this comparison needs to take account of the fact that the EUS is likely to understate consumer expenditures compared with the CES. In the EUS, per capita consumer expenditure was merely a classificatory variable for tabulation of employment characteristics and not the main subject of enquiry. Therefore, consumer-expenditure details were canvassed with a considerably abridged schedule. International experience and a priori reasoning suggest that for a given recall period, a detailed listing of items helps reduce recall error. Conversely, an abridged listing leads to a greater recall lapse

and hence to an understatement of consumer expenditure in comparison to reporting based on a more detailed listing (Deaton and Grosh 2000).

Whereas the CES enquiry canvassed a detailed schedule of 330-odd items spread over some 15 pages, the EUS enquiry canvassed a one-page schedule comprising only 33 items. According to the explanation provided on the relevant enquiry block, this part of the survey was deemed to serve as a 'worksheet' for recording household consumer expenditure. However, all the items would not have been affected by abridgment to the same degree. **For a given recall period, understatement from recall lapse is expected to be the greater the more heterogeneous the basket contained in the abridged description**. The recall lapse is affected by the diversity in consumer purchases and fluctuations in their consumption during the recall period, as well as the concomitant frequency and salience of the respective consumption events in the respondent's memory.

So, given the impact of the abridgement effect, we can expect the 30-day CES estimates based on a detailed schedule to be higher than the corresponding EUS estimates using an abridged schedule. If, in addition, P1 had indeed eventuated as has been maintained by the critics, then the reported 30-day recall-based estimates from CES would also have been pulled up by the 7-day reporting, compared with what they would have been had the 30-day recall been canvassed independently. This would accentuate the EUS-CES difference beyond that arising from the use in the EUS of an abridged schedule. In order to test the possibility P1, relative differences in Tables 13.1R and 13.1U provide the excess of CES estimates over those from the EUS, as a percentage of the UUlatter.

Accordingly, the CES-EUS relative differences indicate the excess of allegedly overstated CES estimates in relation to expectedly understated EUS-based estimates.

Table 13.1R. A Comparison of Estimates of Monthly per capita Expenditures (MPCE) from Consumer Expenditure Survey (CES) & Employment-Unemployment Survey (EUS)

NSS 55th Round July 1999 to June 2000 for All India Rural Population: By Item Group

S.No.	Item	CES	EUS	Diff	Dif
1.	**All Goods and Services**	**486.16**	**443.11**	**43.05**	
2.	Cereals and Substitutes	108.11	106.24	1.87	
3.	Pulses and Products	19.14	18.19	0.95	
4.	Milk and Milk Products	42.56	37.47	5.09	
5.	Edible Oil	18.16	18.05	0.11	
6.	Vegetables	29.98	29.75	0.23	
7.	Fruits (Fresh + Dry Fruits)	8.36	6.65	1.72	
8.	Egg Fish & Meat	16.14	15.72	0.42	
9.	Other Food (Sugar, Salt, Spices & Beverages)	46.36	30.04	16.32	
10.	**Total Food**	**288.81**	**262.11**	**26.7**	
11.	Paan Tobacco & Intoxicants	13.96	12.11	1.85	
12.	Fuel & Light	36.56	32.03	4.53	
13.	Entertainment	2.02	1.02	1.00	
14.	Non-Institutional Medical Services	22.94	22.43	0.51	
15.	Toilet Articles	11.62	14.66	-3.04	-
16	Travel/Conveyance	14.28	10.70	3.58	
17.	Rent	1.89	1.95	-0.06	
18.	Other misc. goods and services	26.65	12.69	13.96	1
19.	Education (Tuition+Newspapers +Books, Stationery etc.)	9.38	13.91	-4.53	-
20.	Institutional Medical Services	6.66	6.32	0.34	
21.	Cloth and Clothing	33.28	32.68	0.60	
22.	Footwear	5.37	5.39	-0.02	
23.	Durable Goods	12.76	15.62	-2.86	-

Notes: 1. CES and EUS-Mean MPCE (Rs) from CES & EUS respectively 2. Diff - difference (Rs) between CES & EUS

3. Diffre - Diff as percent of mean MPCE for respective item from EUS
4. Avg. Diff. 7d-30d: Excess of estimated mpce as per Schd. Type 2 (with 7 day reference period for food, paan, tobacco & intoxicants) over that based on Sch. Type 1 (with uniform reference period of 30-days) as a percentage of the estimates on the 30-day reference period, averaged over the four "Annual" Rounds (1994-95, 1995-96, 1996-97 and Jan-June 1998).

Source: All EUS estimates represent the average of sub-sample estimates generated from Unit Record Data. CES estimates are drawn from: GOI, NSS Report No. 457 (55/100/3), Level and Pattern of Consumer Expenditure in India, 1999-2000, May 2001.

Table 13.1U. A Comparison of Estimates of Monthly per capita Expenditures (MPCE) from Consumer Expenditure Survey (CES) & Employment-Unemployment Survey (EUS)

NSS 55th Round July 1999 to June 2000 for All India Urban Population: By Item Group

S.No.	Item	CES	EUS	Diff	D
1.	**All Goods and Services**	**854.92**	**762.93**	**91.99**	**12**
2.	Cereals and Substitutes	106.02	102.34	3.68	3
3.	Pulses and Products	25.20	24.22	0.98	4
4.	Milk and Milk Products	74.17	66.91	7.26	10
5.	Edible Oil	26.81	27.02	-0.24	-0
6.	Vegetables	43.90	47.86	-3.96	-8
7.	Fruits (Fresh + Dry Fruits)	20.68	17.26	3.42	19
8.	Egg Fish & Meat	26.78	25.90	0.91	3
9.	Other Food (Sugar, Salt, Spices & Beverages)	87.39	52.26	35.13	67
10.	**Total Food**	**410.95**	**363.77**	**47.18**	**12**
11.	Paan Tobacco & Intoxicants	16.22	13.79	2.43	17
12.	Fuel & Light	66.26	58.79	7.47	12
13.	Entertainment	9.88	4.87	5.01	10
14.	Non Institutional Medical Services	30.95	29.57	1.38	4
15.	Toilet Articles	26.34	25.41	0.93	3
16.	Travel/Conveyance	47.19	30.14	17.05	56
17.	Rent	38.16	38.58	-0.42	-1
18.	Other misc. goods and services	67.02	33.06	33.96	10
19.	Education (Tuition+Newspapers+Books, stationary etc.)	37.06	55.83	-18.77	-3
20.	Institutional Medical Services	12.33	11.60	0.68	6
21.	Cloth and Clothing	51.76	50.33	1.43	2
22.	Footwear	10.05	10.22	-0.17	-1
23.	Durable Goods	30.85	36.98	-6.13	-1

Notes: 1. CES and EUS-Mean MPCE (Rs) from CES & EUS respectively 2. Diff - difference (Rs) between CES & EUS

3. Diffre - Diff as percent of mean MPCE for respective item from EUS
4. Avg. Diff. 7d-30d: Excess of estimated mpce as per Schd. Type 2 (with 7-day reference period for food, paan, tobacco & intoxicants) over that based on Sch. Type 1 (with uniform reference period of 30-days) as a percentage of the estimates on the 30-day reference period, averaged over the four "Annual" Rounds (1994-95, 1995-96, 1996-97 and Jan-June 1998).

Source: All EUS estimates represent the average of sub-sample estimates generated from Unit Record Data. CES estimates are drawn from: GOI, NSS Report No. 457 (55/100/3), Level and Pattern of Consumer Expenditure in India, 1999-2000, May 2001.

Now, the central question is **how large should this excess be in order to validate P1?**

As noted earlier, the annual 51st to 54th 'thin sample' rounds of the NSS provide unbiased

estimates of the order of magnitude of this excess (NSSO (2000 (a)). Accordingly, given the expected understatement in the EUS, if P1 holds, we expect the excess of CES over EUS to be unequivocally greater than the excess of the 7-day estimates over the corresponding estimates, averaged over the 4 'thin' rounds (or average 7-day-30-day difference for short). If this does not hold, P1 is not proven. This leaves us with possibility P2 as having eventuated. If this is so, then, the 55th Round would indeed have captured the 30-day recall rendering it comparable to all the earlier rounds of NSS as far as food group is concerned.

It needs to be stressed that the empirical support for P2 does not rest solely on the absence of validation of P1. Specifically, as we shall see presently, **in the case of many significant item groups, the size of the CES-EUS differential is quite small and thus consistent with P2 being true, after allowing for abridgement effect and sample variability.**

Comparing CES and EUS by Commodity Groups

In the light of the foregoing a priori considerations, we now undertake an empirical implementation of the suggested test procedure to resolve the 7-day-30 day recall controversy. It is organised in two parts. The first compares the CES-EUS at the aggregate level of the total rural/urban population but separately across all the comparable commodity groups identified in the abridged EUS schedule. This information is collected in Tables 13.1R and 13.1U, for the rural and urban populations, respectively. The second part performs a similar comparison, but only for the contested

commodity groups, and at a disaggregated level, dividing the population into 20 fractile groups of 5 per cent each. A CES-EUS comparison is given for each fractile group. The commodity group details in this part are confined only to those item groups that are affected by the 7-day-30 day controversy. The information is presented for rural and urban population in Tables 13.2R and 13.2U.

Table 13.2U. Percentage Excess of CES estimates over EUS Estimates of mpce in Food, Paan, Tobacco and Intoxicants in 1999-2000: All India: Urban Population for Five Percent Fractile Groups (percent)

Fractile Group	Cereals & Substitutes	Pulses & products	Milk & Milk Products	Edible Oils	Vegetables	Fruits & Nuts	Eggs, Fish & Meat	Other Food
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. All India Avg. Diff. 7 vs 30 days (%)	15.9	42.1	12.2	22.3	52.5	69.3	50.4	53.4
B. Excess of CES over EUS (%) All Fractile Groups	3.6	4.1	10.9	-0.8	-8.3	19.8	3.4	67.22
B.1 0-5	9.9	3.2	5.3	-3.3	1.8	-6.9	-14.1	60.8
B.2 5-10	5.7	1.7	7.9	-0.7	3.2	1.7	2.3	56.9
B.3 10-15	6.9	1.7	3.1	0.1	1.2	20.8	4.3	56.4
B.4 15-20	2.1	4.2	7.2	0.6	-1.6	20.9	-3.3	64.4
B.5 20-25	4.3	2.2	5.8	-0.3	-3.9	15.5	0.6	57.9
B.6 25-30	2.2	9.1	4.5	2.8	-0.7	12.7	1.8	58.7
B.7 30-35	5.0	2.8	2.9	2.4	-3.4	8.8	-0.6	60.1
B.8 35-40	4.6	4.3	3.4	-1.5	-5.7	10.5	1.0	62.7
B.9 40-45	8.1	9.8	4.4	-1.1	-5.0	13.2	3.7	58.6
B.10 45-50	7.0	3.2	7.6	0.1	-4.1	12.3	8.0	58.0
B.11 50-55	4.2	7.0	16.1	0.2	-5.0	17.3	-2.4	67.7
B.12 55-60	6.3	4.3	11.1	0.7	-7.6	24.2	9.0	65.0
B.13 60-65	2.6	6.2	15.2	1.7	-7.1	22.0	3.0	61.6
B.14 65-70	-0.3	4.4	17.3	2.1	-9.5	24.1	-5.8	65.9
B.15 70-75	-0.5	4.6	11.9	1.4	-14.6	25.7	7.4	69.7
B.16 75-80	4.0	5.4	15.5	-1.7	-12.6	18.1	-0.4	55.8
B.17 80-85	3.0	5.9	11.3	0.3	-10.8	19.2	6.1	65.7
B.18 85-90	4.9	0.6	9.7	-2.7	-12.0	16.4	9.7	67.1
B.19 90-95	-0.3	5.2	15.6	Neg	-12.7	30.2	2.0	61.4
B.20 95-100	-2.5	9.7	9.1	-10.1	-18.2	20.4	12.1	65.2

Notes:
1. Avg. Diff. 7 vs 30 days (%: Ratio of 7-day-recall based estimate to corresponding 30-day-recall based estimate expressed as a percentage and averaged over 51st to 54th rounds of NSS.
2. CES: Consumer Expenditure Survey
3. EUS: Employment-Unemployment Survey

4. 0-5 denotes bottom 5 percent, 5-10, the next 5-percent of the population and so on.
Sources: 1. NSSO (2000a) for the first row. 2 Our calculations based on unit level record for the 55th round of NSS

Table 13.2R. Percentage Excess of CES estimates over EUS Estimates of mpce in Food, Paan, Tobacco and Intoxicants in 1999-2000: All India: Rural Population for Five Percent Fractile Groups (percent)

Fractile Group	Cereals & Substitutes	Pulses & products	Milk & Milk Products	Edible Oils	Vegetables	Fruits & Nuts	Eggs, Fish & Meat	Other Food
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. All India Avg. Diff. 7 vs 30 days (%)	12.9	48.2	19.6	22.8	55.3	60.3	54.2	54.6
B. Excess of CES over EUS (%) All Fractile Groups	1.8	5.2	13.6	0.6	0.8	25.7	2.8	54.3
B.1 0-5	5.6	-7.1	-14.1	-2.5	12.7	30.7	-11.8	34.8
B.2 5-10	3.4	-2.3	-2.8	-2.3	13.6	17.2	-17.8	42.7
B.3 10-15	3.8	1.2	-2.3	-0.7	10.6	-1.7	-8.2	45.3
B.4 15-20	3.0	-0.5	7.1	-2.8	6.6	3.4	-4.5	41.0
B.5 20-25	0.7	2.3	15.0	0.0	6.9	13.8	-4.0	46.2
B.6 25-30	1.8	3.6	9.3	-2.9	2.0	19.2	-7.6	46.3
B.7 30-35	0.5	5.3	11.1	1.4	7.0	6.7	-4.0	49.8
B.8 35-40	0.9	2.7	15.9	0.1	8.2	16.5	6.0	49.9
B.9 40-45	2.3	5.8	11.0	-2.3	5.5	12.7	-2.4	53.2
B.10 45-50	0.3	3.9	12.1	1.6	4.0	17.2	3.7	54.4
B.11 50-55	0.5	6.9	14.6	2.7	6.1	29.5	2.7	49.3
B.12 55-60	-0.4	8.3	11.1	2.9	0.6	34.8	16.1	56.2
B.13 60-65	-0.4	5.4	14.1	3.2	1.8	20.9	-2.7	59.3
B.14 65-70	2.2	4.6	16.7	4.0	-0.5	21.5	5.2	55.6
B.15 70-75	1.0	7.5	13.7	1.8	1.5	21.0	4.2	51.6
B.16 75-80	2.4	5.3	12.0	1.4	-1.5	25.1	6.7	54.9
B.17 80-85	1.8	6.9	21.0	-0.7	-3.2	26.9	-4.4	57.7
B.18 85-90	0.1	6.7	16.7	2.1	-4.9	28.8	11.6	51.3
B.19 90-95	5.0	12.4	13.7	1.6	-7.6	32.5	13.4	52.9
B.20 95-1000	4.3	8.5	15.5	0.9	-7.0	39.3	8.8	67.9

Notes: 1. Avg. Diff. 7 vs 30 days (%): Ratio of 7-day-recall based estimate to corresponding 30-day-recall based estimate expressed as a percentage and averaged over 51st to 54th rounds of NSS.
2. CES: Consumer Expenditure Survey
3. EUS: Employment-Unemployment Survey
4. 0-5 denotes bottom 5 percent, 5-10, the next 5-percent of the population and so on.
Sources: 1. NSSO (2000a) for the first row. 2. Our calculations based on unit level record for the 55th round of NSS.

Let us turn to an examination of Tables 13.1R and 13.1U. For as many as eight out of the nine items in the food group in both tables, the differences between CES and EUS

estimates are well short of the benchmark average 7-day-30day difference emerging from the 51st to 54th annual rounds. In fact, the estimates are amazingly close to each other, given the impact of the use of an abridged schedule in the EUS[3].

The only exception to the above result is the omnibus category of `other food`, comprising sugar, salt, spices, beverages and processed foods including cooked meals. This shows the highest percentage excess within the food group. An excess of 54 per cent almost touches the 7-day-30-day norm for the rural population, whereas for the urban population the CES-EUS difference for this item-group at 67 per cent overshoots the 53 per cent norm emerging from the 'thin' rounds. This item group by itself accounts for nearly two thirds (61 percent in rural India and 64 percent in urban India) of the total difference (disregarding sign) between the CES and EUS in the total food category.

Before proceeding to discuss further the CES-EUS difference in respect of the items in the food group it is useful to review the relative difference between CES and EUS estimates for items outside the food group. Identical reference periods are used for these items in both the 55th round CES and EUS[4]. Therefore, if CES estimates are higher, it is due entirely to the abridgement effect in the EUS. So that, this would provide some bench marks for the pure abridgement effect.

Only for three item groups - `entertainment`, travel/conveyance` and the catch-all category of `other miscellaneous goods and services` - do CES estimates exceed EUS estimates by more than 30 per cent. This does not account for items for which the EUS

estimates actually exceed the CES estimates namely `education`, `footwear` and `durable goods`. In both rural and urban India, the difference is more than 100 per cent in the case of both ` `entertainment` and `other miscellaneous goods and services`. Each of these constitutes a heterogeneous basket where the abridgement effect is expected to be significant, as has been observed in similar cases all over the world.

Notably, the catch-all category of `other miscellaneous goods and services` accounts for a major part of the cumulated difference between CES and EUS estimates outside the food group: 40 per cent of the sum of absolute differences in rural India, and 36 per cent in urban India. To reiterate, any observed excess of CES estimates over the EUS estimates in respect of **all the items outside the food group** are due to the impact of abridgement in the EUS and of sampling variability and **not** the result of any interference due to recall on any alternative recall period.

With this assessment of abridgement effect outside the food group that is free from recall-period effect, let us now revert to a consideration of the CES-EUS differences for items in the food group where both the effects are present.

In eight out of the nine item-groups, as noted previously, the excess of CES estimates over the corresponding EUS estimates (as a percentage of the latter) are well below the average 7-day/30-day difference observed in the 4 "thin" rounds preceding the 55th Round Survey, with only the heterogenous group of "other food" as the exception. The exception is on expected lines as it is consistent with *a priori* reasoning and attributable

to the abridgement effect based on the evidence from international surveys.

Further, in rural India, for 4 item-groups (Cereals and substitutes, Edible Oils, Vegetables, and Egg, Fish and Meat), the CES-EUS difference is less than 3 percent, with this difference slightly exceeding 5 percent for Pulses and Products. In urban India, the CES-EUS difference is below 5 percent for the same 5 item-groups (including two cases, Edible Oils and Vegetables, where the EUS estimates exceed the CES estimates). In both segments, these 5 item-groups accounted for close to two-thirds of the average expenditure on all food in CES.

In respect of all these item-groups, a CES-EUS difference of the order of 5 percent or less, (and way below the 7-day/30-day difference in the "thin" rounds) is quite consistent with the absence of an effect on the 30-day response of a **prior response** on the 7-day reference – if the latter was canvassed first – allowing for the presence of abridgement effects and sampling variability.

This leaves us with three item-groups; Milk and Milk Products (CES-EUS difference of above 5 percent and below, but close to the 7-day/30-day difference); Paan, Tobacco and Intoxicants (CES-EUS difference above 10 percent but well-below the 7-day/30-day difference); and the heterogenous group of "Other Food" with CES-EUS difference being large and close to or above the 7-day/30-day difference.

In respect of Milk and Milk Products (where the CES-EUS difference is 14 percent in

rural India and 11 percent in urban India), a plausible bench mark for the "order of magnitude" of CES-EUS difference that is unaffected by the 7-day-30-day controversy and that reflects only the effects of abridgement and sampling variability is provided by the case of another compositionally diverse group of Fuel and Light which also has a sizeable share in overall PCTE. In the case of Fuel and Light, the CES-EUS difference is 14 percent in rural India and 13 percent in urban India. Further, given that there are 5 major item-categories where the size of the CES-EUS difference is small enough (5 percent or less) to be consistent with the hypothesis of no upward bias in CES on account of the presence of 7-day questions, it does not appear plausible to argue that the responses of the households on the 7-day recall influenced their reporting on the 30-day recall for **Milk and Milk Products** but not for, say, **vegetables** when these item-categories are not very dissimilar in terms of salience and frequency of purchase.

In respect of "**other food**" and, **Paan, Tobacco and Intoxicants**, a rough indication of the size of the CES-EUS differential that can be expected for a very heterogenous group **even in the complete absence of any influence of an alternative reference period on the 30-day recall, and reflecting only the effects of abridgement and sampling variability**, is provided by the differential for the group "Miscellaneous goods and services" in the non-food category: 100 percent for rural India and 103 percent for urban India. As can be readily seen, in respect of both 'Other Food' and, Paan, Tobacco and Intoxicants, the observed CES-EUS differences are well below these bench-mark levels. If this is accepted, even in respect of the two heterogeneous item-groups in the food category which show a large CES-EUS difference, the 55th Round CES estimates can be

taken to reflect the responses on the 30-day recall.

In all these cases, therefore, the size of the CES-EUS differential, allowing for the abridgement effect and sampling variability, is consistent with the hypothesis P2 rather than P1, that is to say, **the 55th Round CES estimates on items in the food group indeed reflect responses on the 30-day recall and hence are comparable to those in the earlier NSS rounds.**

Critics of the 55th round might argue that the test for resolving the 7-day-30-day controversy, when implemented at the aggregate level for the entire population may conceal uneven incidence of the recall problem at the disaggregated level, affecting certain population groups. Indeed, if the 7-day recall had biased upward the 30-day estimate in CES at the lower end of the size distribution, this would overstate consumer expenditure for poorer groups, and hence lead to an understatement in corresponding poverty indicators.

In order to evaluate this possibility, the percentage excess of CES estimates over EUS estimates are mapped across 20 fractile groups of 5 percent size each in Annexure Tables 13.2R and 13.2U, respectively for the rural and urban populations. As mentioned earlier, we apply this analysis only to those items which have been involved in the 7-day-30-day controversy, namely, food, beverages, paan, tobacco and intoxicants. The first line in both tables provides the respective norms for the 7-day-30-day difference derived from the average over the 'thin' 51st to the 54th rounds, as used also in Tables 13.1R and

13.1U for all-India rural and urban populations. These broad yardsticks continue to be used as the common standard of comparison because differentials derived from comparable `thin samples` at the fractile-group level are expected to carry higher relative standard errors.

Remarkably, in both Tables 13.2R and 13.2U, CES-EUS differences for all but one of the item groups lie well below the yardsticks provided by the 51st through 54th rounds. The exception is provided by the same group that stood out in Tables 13.1R and 13.1U – namely `other food`. The reason is also the same: this is an aggregate of heterogeneous items for which abridgement effect is expected to be very pronounced. However, it is remarkable that for the bottom 40 per cent of the rural population, even this diverse group of items registers relative CES-EUS differences that are well below their respective yardsticks.

Further, in almost all fractile groups in the bottom 40 percent, the CES-EUS difference is 5 percent or less for at least 4 item-categories.

What we have therefore shown is that the observed differences between the 30-day-based CES estimates and EUS estimates overwhelmingly reflect the combined impact of the abridged schedule in the EUS and sampling variability. **These differences in turn are too small to support the hypothesis that the CES estimates on the 30-day reference period have been artificially inflated because households extrapolated their 30-day reporting from a 7-day recall.** Therefore, the narrowed differential between the 7- and

30-day recall-based estimates in the 55th round CES that we noted in I.1 has to be due to possibility P2 which, as outlined in the same sub-section, requires that the households predominantly reported expenditures on the 30-day recall and may subsequently have adjusted their 7-day estimates accordingly.

Adjusting the 50th Round Result for Mixed Reference Periods

As mentioned in section I.1, in the CES for 1993-94 (50th round), information on clothing, footwear, durables, education and health (institutional) was collected from each sample household for two alternative reference periods of 30 days and 365 days. Notably, for all the remaining items in the 50th round, a uniform 30-day recall was used. It is thus possible to compute two alternative size distributions for the 50th round-one based on a uniform reference period (URP) of 30 days, and another based on a mixed reference period (MRP) of 365 days for above-mentioned items, and 30 days for the remaining items. This is important for establishing recall-period comparability between the 50th round and the 55th round, in view of the shift to MRP in the latter.

Before we report the results of our exercise, it is useful to raise the question of whether canvassing two alternative recall periods in the case of the 50th round raises possible problems of the first recall influencing the reporting for the second, of the kind discussed in connection with the food group in the previous sections. In the 50th round CES, the items of concern are: (a) clothing, (b) footwear, (c) durables, (d) education and (e) institutional health expenditures. As noted above, information on these items was

collected in the 50th round on two alternative recall periods of 30 days and 365 days, from the same set of sample households. In the schedules of enquiry, the blocks relating to (a) to (c) were placed one after the other, with the 30-day recall coming first, whereas for (d) and (e), they were side-by-side. Prima facie, it cannot be completely ruled out that this might pose problems.

In our judgement, however, their incidence is likely to be minimal, for the following reasons. First, expenditures on (a) to (e) relate to events that are relatively less frequent and more salient in the respondent`s memory than those in the food group. Accordingly, expenditures over the last 30 days can be more easily distinguished from those in the last 365 days. This is not the case with the items in the food group. Purchases of these food items are likely to have been more frequent and less memorable, providing greater incentive to minimise the additional effort required to accurately recall expenditures. Second, it is deemed significant that there was some previous experience in the use of the two recall periods in the case of clothing etc. Information on items (a) to (c) had been collected from the same set of households, eliciting information on the basis of the same two alternative recall periods, for the three quinquennial rounds preceding the 50th round. In addition, field officials had been explicitly instructed to check the recorded entries against the two recall periods, presumably to keep some check on the investigators.

What light does the evidence from the 'thin' rounds throw on this issue of the 50th Round estimates of consumer expenditure on the 365-day reference period being influenced by the prior responses on the 30-day recall in respect of items of low-frequency purchase?

We have tabulated, for all-India, but separately for the rural and the urban populations, the estimates of consumer expenditure on the two recall periods for the 50th Round and three full-year, "thin" rounds (51st, 52nd and the 53rd) for Clothing and Durables. This has been done for broad fractile groups – the bottom 40 percent and the middle 40 percent, with the top 20 percent being split into three-groups: the 80th-90th percentile; the 90th-95th percentile and the top 5 percent. For the 50th Round these are exact percentiles, but, for the 'thin' rounds, they would be approximate – obtained by aggregating the estimates for (fixed) expenditure – classes[5]. The outcome is presented in Tables 13.3R and 13.3U.

For the population as a whole, in the 'thin' rounds, the expenditure reported on the two reference periods are fairly close to one another for clothing in the rural population while the urban population reported higher expenditure on 365 day recall than that for 30 days. However, in respect of durables the 365-day estimates are substantially lower than the estimates on the 30-day recall, for both the segments.

In the 50th Round, the overall monthly per capita expenditure (MPCE) on clothing on the 365-day recall was about 40 percent higher than that on the 30-day recall. In the case of durables, however, the estimated expenditure on the 365-day recall were **lower** by about 14 percent (rural) and 20 percent (urban).

Tables 13.3R and 13.3U show that there are differences in consumer behaviour in respect of these relatively infrequently purchased items across fractile groups.

Now, **focusing on the bottom 40 percent**, we find that the estimates of expenditure on clothing on the 365-day recall are substantially higher than those on the 30-day recall in both the 50th Round and in the 'thin' rounds – but the differential is greater in the 50th Round. Broadly, the same is also true in respect of the durables: an excess of estimates on the 365-day recall over those on the 30-day recall of between 4 and 54 percent in the 'thin' rounds and of 160 percent in the 50th Round. (See Tables 13.3R and 13.3U). In other words, for the poor population these items are much more infrequent in their purchases of the last 30 days as compared to those during the last 365 days.

Table 13.3R. 30-day/365-day estimates of MPCE for Clothing and Durables by Broad Fractile Group in the 50th, 51st, 52nd and 53rd Rounds of the NSS Consumer Expenditure Surveys: All-India Rural (Rs.0.00)

Clothing

	50th Round		51st Round		52nd Round	
	30-days	365-days	30-days	365-days	30-days	365-days
Bottom 40%	**2.63**	**14.09**	**3.43**	**10.64**	**2.84**	**12.38**
Middle 40%	10.14	21.29	12.54	16.44	10.44	18.91
80-90	27.03	29.23	31.68	23.88	28.44	26.79
90-95	47.48	33.21	49.94	28.48	56.39	32.86
95-100	98.74	46.92	136.85	44.88	130.48	45.88
All	**15.12**	**21.18**	**21.78**	**21.21**	**26.63**	**26.43**

Durables

	50th Round		51st Round		52nd Round	
	30-days	365-days	30-days	365-days	30-days	365-days
Bottom 40%	**1.00**	**2.60**	**1.18**	**1.23**	**1.12**	**1.33**
Middle 40%	3.04	5.22	3.40	2.46	3.76	2.85
80-90	7.28	10.33	8.84	5.71	8.68	5.81
90-95	11.09	14.70	17.49	8.54	16.40	8.79
95-100	95.54	33.44	196.91	30.41	113.80	29.96
All	**7.67**	**6.57**	**16.12**	**6.29**	**15.36**	**8.25**

Source: Computed from NSSO (2000a).

Table 13.3U. 30-day/365-day differences in MPCE for Clothing and Durables by Broad Fractile Group in the 50th, 51st, 52nd and 53rd Rounds of the NSS Consumer Expenditure Surveys: All-India Urban (Rs.0.00)

Clothing

	50th Round		51st Round		52nd Round	
	30-days	365-days	30-days	365-days	30-days	365-days
Bottom 40%	**3.58**	**18.51**	**3.75**	**14.11**	**3.31**	**15.71**
Middle 40%	15.94	32.90	17.68	26.62	16.84	27.97
80-90	40.46	48.47	41.97	39.82	49.43	42.56
90-95	62.07	62.07	66.62	49.57	73.72	54.57
95-100	129.62	84.12	154.25	72.67	213.29	79.00
All	**21.43**	**32.72**	**28.11**	**34.26**	**42.65**	**40.10**

Durables

	50th Round		51st Round		52nd Round	
	30-days	365-days	30-days	365-days	30-days	365-days
Bottom 40%	**1.20**	**3.02**	**1.72**	**1.71**	**1.48**	**1.60**
Middle 40%	5.14	8.82	5.04	3.89	5.08	4.79
80-90	13.77	18.62	14.72	11.81	16.72	13.82
90-95	26.53	32.95	21.44	19.75	26.26	15.13
95-100	198.64	78.44	226.09	59.00	308.81	74.58
All	**15.16**	**12.17**	**22.89**	**12.47**	**38.75**	**18.31**

Source: Computed from NSSO (2000a).

For purposes of poverty estimates we may focus on the above-stated results for the bottom 40 percent: that the excess of the estimates of expenditures on clothing and durable on the 365-day recall over those on the 30-day recall are greater in the 50th Round relative to the differentials yielded by the 'thin' rounds. If the argument is that canvassing the two alternative recall periods on the same set of households has biased the estimates on the 365-day recall because of their *prior* responses on the 30-day recall by minimising their recall efforts, then such an interference should have brought the comparable *monthly* estimates on the two recall periods *closer* relative the differences

emerging from the 'thin' rounds. This has *not* happened. The estimates on the two recall periods appear to be indeed based on independent recall efforts on the part of the respondents.

Tables 13.4R and 13.4U present, respectively for the rural and the urban populations, the size distributions of total household consumer expenditure in the 50th Round with uniform and mixed referenced periods according to 5 percent fractile groups. The households are ranked according to the size of monthly per capita total consumer expenditure (PCTE).

Table 13.4R. NSS 50th Round: A Comparison of Size Distribution by 5% Fra Uniform and Mixed Reference Periods: All India: Rural Population

Fractile Group	Cumulative % of Population	Average pcte URP	Cum % CE by 30-day	Average pcte I
0-5%	5	101.3139	1.80	110.2837
5-10%	10	131.1899	4.13	141.7052
10-15%	15	147.2251	6.75	158.7001
15-20%	20	160.8434	9.61	172.626
20-25%	25	172.7032	12.67	184.7478
25-30%	30	183.6508	15.94	196.1252
30-35%	35	195.0225	19.40	207.5231
35-40%	40	206.4848	23.07	218.9433
40-45%	45	218.0165	26.94	231.0298
45-50%	50	230.531	31.04	243.5303
50-55%	55	243.749	35.37	256.804
55-60%	60	257.9355	39.95	270.8079
60-65%	65	273.5705	44.82	286.229
65-70%	70	291.2079	49.99	303.3376
70-75%	75	312.0809	55.53	322.6343
75-80%	80	337.115	61.52	345.9822
80-85%	85	371.5535	68.13	376.3839
85-90%	90	419.6128	75.58	419.0215
90-95%	95	499.0608	84.45	490.8102
95-100%	100	875.375	100.00	781.9013
0-100%		281.4032		285.9563

Notes: All numbers in bold are the revised estimates.
URP: uniform (30 day) reference period for all items of consumer expenditure.
MRP: mixed reference period: 365 days for clothing, footwear, education and health (institutional) and 30 days for all the remaining items
CE: Aggregate Consumer Expenditure
Pcte: per capita total consumer expenditure
Sources: Estimates by authors from the unit level records of the 50th Round.

Table 13.4U. NSS 50th Round: A Comparison of Size Distribution by 5% Between Uniform and Mixed Reference Periods: All India: Urban Population

Fractile Group	Cumulative % of Population	Average pcte URP	Cum % CE by 30-day	**Average pcte MRP**	**C**
0-5%	5	133.0799	1.45	**144.2726**	
5-10%	10	175.8905	3.37	**188.5886**	
10-15%	15	201.9348	5.58	**215.6687**	
15-20%	20	222.8357	8.01	**237.9062**	
20-25%	25	242.3559	10.65	**258.9554**	
25-30%	30	261.9733	13.51	**279.101**	
30-35%	35	281.1159	16.58	**298.7234**	
35-40%	40	302.5225	19.88	**319.4199**	
40-45%	45	323.6575	23.42	**341.5709**	
45-50%	50	346.5325	27.20	**365.0693**	
50-55%	55	370.3242	31.24	**389.3419**	
55-60%	60	397.9061	35.58	**416.542**	
60-65%	65	430.2546	40.28	**447.7376**	
65-70%	70	467.1801	45.38	**484.4874**	
70-75%	75	513.6512	50.99	**528.6223**	
75-80%	80	569.3199	57.20	**583.3929**	
80-85%	85	641.3186	64.20	**651.9997**	
85-90%	90	742.1016	72.30	**747.8689**	
90-95%	95	911.4375	82.25	**911.5722**	
95-100%	100	1626.268	100.00	**1457.917**	
0-100 %		458.083		**463.4379**	

Notes: All numbers in bold are revised estimates.
URP: uniform (30 day) reference period for all items of consumer expenditure.
MRP: mixed reference period: 365 days for clothing, footwear, education and health (institutional) and 30 days for all the remaining items
CE: Aggregate Consumer Expenditure
pcte: per capita total consumer expenditure

Source: Estimates by authors from the unit level records of 50th Round.

It may be noted that a shift from 30-day recall to 365-day recall in respect of clothing, footwear, durables, education and institutional health expenditure leads to a higher mean

PCTE for fractile groups in the bottom 85 percent and 95 percent of the rural and urban populations, respectively. In other words, for these sections of the population, mean per capita monthly expenditure on the above-mentioned items was higher on the basis of 365-day recall than it was for the preceding 30-day recall. In contrast, for the top 10 percent and 5 percent of the respective rural and urban population, the mean monthly per capita household expenditure on these items was lower with a 365-day reference period in this instance. The overall mean PCTE turns out to be marginally higher (by 1.6 percent in rural India and by 1.2 percent in urban India) with the mixed reference period.

The corresponding Lorenz curves (LC's) presented in Chart 1 for the rural population and in Chart 2 for the urban population, show that the LC based on a mixed reference period (MRP) lies uniformly inside the LC based on 30-day uniform reference period (URP). Consequently, the summary measure of relative inequality based on the LC, namely the Gini coefficient, is distinctly lower when it is based on an MRP than on a URP. The respective Gini coefficients for rural and urban population are 0.2581and 0.3184 for the MRP, and 0.2859 and 0.3438 for the URP.

Since the reported PCTE for the bottom fractile groups is higher under MRP than that under URP, for 1993-94, the headcount ratios based on MRP.are expected to be lower than that based on URP.

Poverty Outcomes in the 1980s: The All-India Picture

Comparable Headcount Ratios and Related Measures of Poverty

In the previous section we discussed the problems of comparability pertaining to consumer expenditure surveys from the 50th and 55th rounds of the NSS, which have been highlighted during recent debates about poverty trends in the 1990s in India. Our empirical analysis, based partly on the published results, and partly on unit-level records of the 50th and the 55th rounds of NSS, have established the following:

- First, the published size-distribution of the first five quinquennial rounds, including the 50th round in 1993-94, are based on a uniform, 30-day reference period (URP) and headcount ratios calculated from them are comparable.
- Second, the published size-distributions of the 50th round for 1993-94, and the 55th round for 1999-2000 are not directly comparable because of the differences in the recall period, namely, URP in the 50th round and a mixed reference period (MRP) in the 55th round.
- Third, as regards the 7-day-30-day controversy besetting the CES in the 55th round, evidence presented in section I suggests that the size-distribution of the CES in the 55th round based on 30-day recall for the food group is comparable to the MRP-based size-distribution of the 50th round.
- Fourth, the size-distribution of the 50th round can be recast for MRP, and we have recalculated it with MRP in section I.4, to make it directly comparable to the 55th round.

These points enable us to calculate comparable poverty indicators in order to assess

India's much-debated aggregate poverty outcomes over the 1980s and 1990s. To this end we use five summary indicators that capture different dimensions of absolute deprivation.

The first and generally the most widely used indicator is the headcount ratio (HCR), which specifies the proportion of the population that is estimated to be at or below an exogeneously defined poverty line. However, it ignores size of the poverty gap, that is, how far below poverty line different poor households are in terms of their PCTE relative to the poverty line. It also does not take account of relative inequality among the poor.

The second indicator is a poverty gap index (PGI), which sums up the poverty gaps of poor households and normalises the resulting aggregate (weighted) poverty gap. This is done by reference to the maximum possible poverty gap for the entire poor and non-poor population, derived from the product of the poverty line and the total population. Accordingly, given two populations with the same level of HCR, the one with higher PGI will have a larger concentration of the poor population living farther away from the poverty line. Hence it is taken to describe the depth of poverty.

The third and fourth poverty indicators are the squared poverty gap (SPG, denoted as FGT* in subsequent discussion) and the Sen Index (SI) (Sen 1976). In addition to the headcount ratio and the poverty gap, these indicators take into account the relative inequality among the poor. However, SPG and SI differ from each other in terms of the underlying summary measure of relative inequality. SPG incorporates squared coefficient of variation, whereas the SI uses the Gini coefficient among the poor

population. Because of their sensitivity to relative inequality, SPG and SI are taken to measure the severity of poverty. Indeed, because they incorporate as component measures both the HCR and the poverty gap, as well as the measure of relative inequality among the poor, these indicators are by far the most comprehensive measures of absolute deprivation. Accordingly, given the same HCR and PGI for two populations, the one with higher SPG and SI reflects a greater severity of poverty. A reference may be made to Sundaram and Tendulkar (1993) for a discussion of these measures.

We may add that HCR, PGI and SPG, or FGT* are special cases of general class of decomposable poverty indicators suggested by Foster et al (1984).

The fifth and final indicator of poverty used in this paper is the size of the poor population – variously described also as the 'absolute headcount', 'the numerical magnitude', or simply 'the number of poor people'. It is given by a multiplication of the sample survey-based estimated headcount ratio (HCR) and the *estimated* total population at the midpoint of the survey period. The qualifying adjective 'estimated' is to be underlined because both components of the product are *estimated* independently of each other and are not based on direct observations: HCR is based on the estimated size distribution of PCTE among the universe of all households, which, in turn, is based on an appropriately selected sample of households. Similarly, 'total population at the midpoint of the survey period' is an interpolated, or projected figure. Consequently, the size of the poor population is to be regarded as a probabilistic point estimate of the aggregate macro-level order of magnitude of the poor population.

Three comments are warranted on the interpretation of the last indicator. First, it does not permit physical identification of poor persons or households at the micro level. This would require a complete census. Second, a change in the size of the poor population during the time interval between the two surveys merely indicates the net change in the estimated number of poor people between the midpoints of the two survey periods from all sources. Third, this change in size has two components: (a) change due to changes in the HCR between two time-points, which is then applied to the base year population; (b) change in the total population between two time-points, which is applied to the HCR in the terminal year. Notice that (b) is always positive while (a) will be negative in cases where the headcount ratio declines. Either component may dominate the other.

The five summary indicators of poverty are presented in Table 13.5. They are shown for the rural, urban and total population at the all-India level, mapped across three time points: 1983, 1993-94 and 1999-2000. The choice of years is governed by a specific set of considerations. The idea is to monitor descriptively the progress in poverty reduction over the last two decades and in the process also bring out differences in the level comparability of HCR, arising from uniform and mixed reference periods. To represent the decade of the 1980s, we could have chosen to compare the 43rd round for 1987-88 with the 38th round for 1983. However, poverty – in particular rural poverty – is known to be affected by abnormal harvests and 1987-88 was a meterological drought year. Hence it was excluded. So that, in our subsequent discussion, we refer the 10½ years period between the 1983 and 1993-94 Surveys as the decade of the 1980s and the 6-year

period between 1993-94 and 1999-2000 as representing the decade of the 1990s. Other analysts, notably Sen and Himanshu (Sen and Himanshu, 2004) take the 6-year period between the 1987-88 and the 1993-94 surveys to represent the decade of the 1980s.

Table 13.5. Alternative Measures of Poverty in India: All-India Rural, Urban All-Areas: 1983-1999-2000

Segment/Measure	Measures on URP		Measures on
	1983	1993-94	**1993-94**
(1)	(2)	(3)	**(4)**
ALL-INDIA RURAL			
1. Head Count Ratio (Percent)	49.02	39.66	**34.19**
2. Poverty-Gap Index	0.1386	0.0928	**0.0728**
3. FGT*	0.0545	0.0315	**0.0232**
4. Sen Index	0.1882	0.1278	**0.1014**
5. Number of Poor ('000)	**268, 593**	**261, 380**	**225, 330**
ALL-INDIA URBAN			
1. Head Count Ratio (Percent)	38.33	30.89	**26.41**
2. Poverty-Gap Index	0.0995	0.0749	**0.0600**
3. FGT*	0.0366	0.0265	**0.0202**
4. Sen Index	0.1362	0.1034	**0.0833**
5. Number of Poor ('000)	**65, 798**	**72, 633**	**62, 099**
ALL-INDIA ALL AREAS			
1. Head Count Ratio (Percent)	46.47	37.35	**32.14**
2. Poverty-Gap Index	0.1293	0.0881	**0.0694**
3. FGT*	0.0502	0.0302	**0.0224**
4. Sen Index	0.1758	0.1214	**0.0966**
5. Number of Poor ('000)	**334, 391**	**334, 013**	**287, 429**
Memorandum Item			
Total (All areas) Population (000)	719, 587	894, 188	**894, 188**
Share of Urban Population (Percent)	23.86	26.30	**26.30**

Notes:
1. Official all-India poverty lines in terms of monthly per capita total expenditure (mpcte) of Rs.49.09 (rural) and Rs.56.64 (urban) at 1973-74 prices have been used in the calculations in this Table. They have been adjusted for changes in prices using the price indices specifically compiled for the poor population. The numerical values of the price adjusted poverty lines in terms of mpcte at current prices are given below for the years used in this study

	1983	1993-94	1999-2000
Rural	93.16	211.30	335.46
Urban	111.25	274.88	451.19

2. All numbers in column 4 are the revised estimates.

Sources: Estimates HCR, PGI, FGT* and SI for 1983 are drawn from, Tendulkar, Sundaram and Jain (1993), Parallel estimates for 1993-94 with Uniform and Mixed Reference Periods and with Mixed Reference Period for 1999-2000 have been estimated from unit record data for the 50th rounds of Consumer Expenditure Survey

Table 13.5 provides two estimates for 1993-94, one based on uniform reference periods (URP) and another based on mixed reference periods (MRP). The estimates based on URP are comparable to the 1983 estimates while the MRP-based estimates for 1993-94 are comparable to the estimates for 1999-2000.

Poverty outcomes in India in the 1980s

To contextualise this exercise, and to provide a point of reference for the changes in poverty over the 1990s, let us first consider briefly the changes in poverty over the 10½ years between July 1, 1983 and January 1, 1994. In both rural and urban India, and hence, also at the all-India level, there is a clear reduction in the headcount ratio, poverty-gap index, FGT* and Sen Index. In rural India, the annual average decline in the headcount ratio over the 10½ year period was a little under 0.9 percentage points. In urban India, the corresponding decline was 0.7 percentage points per year. For rural and urban areas taken together, the average decline in HCR was close to, but below 0.9 percentage points per annum.

In terms of the estimated number of people living below the poverty line, or, the poor population, there is a clear rural-urban contrast. While in rural India the size of the poor population declined by a little under 7.2 million over the 10½ year period , translating into an annual average decline of 0.69 million, in urban India, the number of poor people increased by 6.8 million between July 1, 1983 and January 1, 1994, despite the reduction in the corresponding headcount ratio. Consequently, for both rural and urban areas taken

together, the number of poor people in India increased marginally by 0.38 million.

However, the rise in population of the poor in urban India, which more than offset the decline in the size of the poor population in rural India, has to be seen in the context of a rapid growth in urban population, from 171.7 million to 235.2 million. This corresponds to a growth rate of over 3 per cent per annum.

We may caution also that the entire increase in urban population cannot be attributed to rural-urban migration. A rise in the urban population also takes place (a) because of natural population growth in areas which remain classified as urban across survey years; (b) because of an addition of population in the areas that in the base year were rural but re-classified as urban in the terminal year; and (c) because of inter-censal growth of this population.

Poverty in India in 1990s

What has been the record on poverty in India over the 1990s?

To start with, notice that a shift from URP to MRP for 1993-94 results in a head count ratio for 1993-94 that is nearly five-and-a-half percentage points lower than that on the uniform reference period for rural India. For urban India, the difference is much lower (4.5 percentage points). For the country as a whole (that is taking the rural and the urban population together), the headcount ratio for 1993-94 on the mixed reference period is lower by 5.2 percentage points. Accordingly, an uncorrected and hence inappropriate

comparison based on the published results (URP for 1993-94 and MRP for 1999-2000) would overstate the decline over the six years by the same magnitude.

Using comparable MRP-based measures for both1993-94 and 1999-2000, we find that, except in respect of the number of poor in urban India, all measures of poverty showed a clear decline in both rural and urban areas and, therefore, also for the country as a whole.

Consider first the rural population. At the all-India level over the six year period from 1st January,1994 to 1st January, 2000, the head count ratio declined by over 5 percentage points translating to an average decline of a slightly under 0.9 percentage points per annum- roughly the same as that realised between 1983 and 1993-94. It is necessary further to normalise by reference to the initial level value of the indicator for appropriate comparability[6]. By taking the annual average decline by reference to the base year level values (of 49 percent on URP for 1983 and of 34 percent on MRP for 1994). The rate of annual average decline between 1993-94 and 1999-2000 at 2.6 percent is higher than that achieved between 1983-1993-94 (1.8 percent). In terms of the number of rural poor, the 1990s witnessed a decline of a little under 14.7 million over the six year period i.e, an annual average decline of a little under 2.5 million. This may be contrasted with the annual average decline of a little over 0.7 million between 1983 – 1993-94.

As noted above, PGI, FGT* and Sen Index also record a decline for the rural population between 1993-94 and 1999-2000.

For urban India too, HCR, PGI, FGT*, and Sen Index record a decline between 1993-94 and 1999-2000. Taken as they are, the annual average decline in all these Indices are slightly smaller in the 1990s than that between 1983 and 1994. However, when normalised by reference to the relevant base year values, the rates of annual average decline are slightly higher between 1993-94 and 1999-2000. In terms of the **number of poor in urban India we have a rise in both periods**. However, aided by a slightly slower growth in urban population, the annual average increase (0.3 million) between 1993-94 and 1999-2000 was less than half the annual average increase in the number of urban poor between 1983 - 1993-94 (0.65 million).

The picture for the country as a whole, (i.e. taking the rural and urban population together) parallels that for the rural population with declines in all the poverty indicators between 1993-94 and 1999-2000, with the normalised (with reference to base year values) annual average declines being higher for the 1990s than for the 1980s. Particularly noteworthy is the decline in the absolute number of poor at nearly 3 (2.7) million per annum compared to an increase (albeit marginal) between 1983 and 1993-94.

Our assessment of a clear decline in poverty in India in the 1990s is now shared by almost all analysts of the poverty situation in India with differences being limited to the extent of decline. Tied to this question of the extent of decline is the issue of whether or not there has been a decline in the number of poor in the country.

The alternative view that the number of poor in India increased between 1993-94 and 1999-2000 has been argued in an important paper by Sen and Himanshu (Sen and Himanshu (2004)).

Central to their result of a rise in the number of poor, in rural India and in the country as a whole is their estimates of head count ratio for 1999-2000 derived by altering the 55th Round CES size-distribution by "adjusting pro-rata its unit level data item-wise and state-wise with corrections for 'contamination'". (Ibid, p.4255).

A few comments are in order.

First, based on their "estimates of over estimation due to 'contamination' in 30-day estimates of the 55th Round Consumer Expenditure Survey" (Table 5, ibid p.4254). Sen and Himanshu themselves note that these results "attribute bulk of CES-EUS difference to EUS underestimation and return strikingly small estimates of CES 'contamination'" Ibid (emphasis added).

It needs to be emphasized that, having arrived at this judgement, we take the size-distribution from the NSS 55th Round Consumer Expenditure Survey on the 30-day recall for items in the food group as they are to generate poverty measures for 1999-2000. In particular, we do not seek to alter the reported 55th Round CES size-distribution by "adjusting pro-rata its unit level data item-wise and state-wise with corrections for 'contamination'" as Sen and Himanshu do. (Ibid, p.4255).

We have deliberately refrained from doing any such pro-rata 'Item-wise and State-wise' adjustment of the 55th Round unit-level data. Our reasoning for **not** doing such a pro-rata adjustment is the following.

As can be seen from Tables 13.2R and 13.2U, the CES-EUS differences are uneven across fractile groups and, in respect of 'other food' which accounted for the bulk of the CES-EUS difference for the 'food group' taken as a whole, the CES-EUS differences for the bottom 40 percent are lower than the average. So that, if at all any adjustment to unit-level data are to be made 'Item-wise and state-wise', then the extent of "contamination" too needs to be specified by fractile groups (preferably 5 percent-fractiles) for each State and each of the affected items. Even for a state as a whole, the CES and the EUS estimates of item-wise expenditure may be expected to carry sizeable "sampling errors."

The size of these errors will necessarily be larger when these are sought to be estimated for deciles or 5-percent fractile groups. It needs to be emphasized that, having arrived at this judgement, we find pro-rata adjustment in observed behaviour to be inappropriate and consequently we take the size-distribution from the NSS 55th Round Consumer Expenditure Survey on the 30-day recall for items in the food group as they are to generate poverty measures for 1999-2000.

Secondly, it needs to be re-iterated that our derivation of an alternative MRP-based size-distribution for 1993-94 merely involves re-combining at the unit-level the households' own responses on the 365-day reference period for clothing, footwear, durables, education and (institutional) health care and on the 30-day reference period for all other items. Specifically, no pro-rata scalar adjustments have been made to unit level data. On this, Sen and Himanshu have noted that, "…it must be accepted that S-T (Sundaram &

Tendulkar) were correct in treating poverty estimates from the 50th round MRP as a valid objective method of dealing with the 365-day issue". (Ibid, p.4251)

Finally, if we use the Sen-Himanshu MRP-estimates for 1993-94 and, their 'unadjusted' estimates for 1999-2000 (on a judgement that their 'itemwise, state-wise adjustment' is inappropriate for the reasons indicated above) then, it can be readily shown that, the number of poor in both rural and urban India did decline between 1993-94 and 1999-2000.

Thus, using the population estimate given in Table 13.5 and the Sen-Himanshu HCR estimates for 1993-94 based on MRP (Rural: 31.6% & urban 27.9% as per Table 4, p. 4253) and their unadjusted estimates for 1999-2000 (Table 6(a) for Rural India and Table 6(b) for Urban India, pages 4255, and 4256) of 27.0 percent (Rural) and 23.4% (Urban), the absolute number of rural poor declines from 208.3 million in 1993-94 to 196.6 million in 1999-2000. For the
country as a whole – putting rural and urban areas together – the number of poor declines from 273..9 million to 261 5 million, i.e. a decline of 12.4 million between 1993-94 and 1999-2000.

Table 13.6. Estimates of Poverty in India, 1993-94-2004-05
Head Count Ratios (Percent) Number of Poor ('000s)

Panel A: On Uniform Reference Period

	Rural		Urban		All-Areas	
Year	HCR	Number of Poor	HCR	Number of Poor	HCR	Number of Poor

1993-94	39.66	261,380	30.89	72,633	37.35	334013
2004-05 (Poverty Line)	31.80 (Rs.371.29)	248,029	26.74 (Rs.546.20)	74,102	29.47	322131

Panel B: On Mixed Reference Period

	Rural		Urban		All-Areas	
Year	**HCR**	**Number of Poor**	**HCR**	**Number of Poor**	**HCR**	**Number of Poor**
1993-94	34.19	225,330	26.41	62,099	32.14	287429
1999-2000	28.93	210,673	23.09	63,987	27.32	274660
2004-05 (Poverty Line)	25.95 (Rs.371.29)	202,401	22.84 (Rs.546.20)	71,504	25.06	273905

Notes:
(1)Total Population: 2004-05 ('000s): Rural: 779,967; Urban: 313,064; Total: 1093,031
(2) Estimates for 1993-94 and 1999-2000 drawn from Table 5.

Summary and Conclusions

Two key changes in the design of the NSS 55th Round Consumer Expenditure Survey – the canvassing on two alternative reference periods of 30-days and 7-days of household consumer expenditure on food, paan, tobacco and intoxicants and recorded in blocks located side-by-side, and, the use of a single 365-day reference period in respect of expenditure on clothing, footwear, education and (institutional) health care – had raised serious doubts about the comparability of the size distributions and of the poverty

measures based on them from the NSS 50th (1993-94) and the 55th (1999-2000) rounds of Consumer Expenditure Surveys. Set against these doubts, our effort in this paper has been to derive a set of comparable estimates of poverty measures, separately for the rural and the urban populations, at the all-India level.

Comparability of the poverty measure for 1993-94 and 1999-2000 has been established in two steps.

First, it is established that the 30-day CES estimates have not been artificially biased upwards by the simultaneous canvassing on the 7-day reference period. This has been done by undertaking a comparison of the CES estimates of consumer expenditure on individual items in the food group with those identified in the 55th Round Employment-Unemployment Survey – canvassed with a single reference period of 30 days over an independent sample of households drawn from the same population. This exercise showed that the 30-day estimates from the Consumer Expenditure Survey (CES) were strikingly close to the independent EUS-estimates with divergences reflecting overwhelmingly the effects of the use in the EUS of a highly abridged worksheet.

For generating estimates of poverty measures for 1993-94 that are comparable to the estimates for 1999-2000 (with a 365-days for clothing, footwear, durables, education and institutional health care and 30-days for all other items including the food group) we derive, from the responses of the households about their expenditure on clothing, footwear etc. on a 365-day reference, a new size-distribution with a mixed reference

period comparable to that used in the NSS 55th Round Consumer Expenditure Survey. This was possible because the 50th round collected information on the infrequently purchased items on both the 30-days and the 365-days recall periods. Poverty measures for 1993-94 comparable to the estimates for 1999-2000 (labelled MRP estimates) are estimated using the size-distribution of consumer expenditure derived as described above.

Using comparable estimates of poverty measures for 1993-94 and 1999-2000 derived as above it has been shown in this paper that in rural India and in the country as a while there has been a clear decline in poverty over the 1990s on all the five measures – the head count ratio, the poverty-gap Index, the squared poverty gap or FGT*, the Sen-Index and the absolute number of poor. In urban India too, except for a small rise in the number of poor, we observe a decline in poverty on all the other four poverty measures.

Finally, a word of caution in interpreting these results.

In the paper, we have deliberately avoided bringing in a discussion of the possible factors explaining the decline in poverty. In this vein, we would also like to caution that the average annual percentage point decline is not expected to be spread evenly over the intervening years. In an earlier paper, one of us had brought out the complexity of causal mechanisms impacting poverty on the basis of poverty calculations from 1970-71 to 1993-94 (Tendulkar 1998). It was argued that a poverty outcome in a given year is a combined consequence of (a) the impact of economic reforms and reform-related factors; (b) the impact of other secular factors operating since pre-reform years; and (c) the

impact of year-specific abnormal factors, such as a drought.

We may also emphasise that the expected favourable effects of economic reforms and reform-related factors on poverty operate through their impact on raising the long-term growth path of the economy. Higher growth rates, in turn, generate sustainable productive employment opportunities which provide the only enduring solution to poverty-eradication.

A Post script: Some Results from NSS 61st round survey, 2004-05

The release late last year of the results of the NSS 61st Round Consumer Expenditure Survey, (CES) 2004-05 has revived the debate on the poverty outcomes in India in the 1990s.

The published results provide the size-distribution of consumer expenditure on a uniform 30 day reference period but, with the exception of one table on the size distribution of households, **not** on a mixed reference period. Himanshu (2007) presents the argument about very little progress in poverty reduction between 1993-94 and 1999-2000 in two steps. In the first step, broadly comparable estimates of poverty ratios for 1993-94 and 2004-05 on a uniform reference period are presented. At the all-India level, the rural head count ratio is estimated to have declined from 37.2 percent in 1993-94 to 28.7 percent in 2004-05 and in urban India from 32.6 percent to 25.9 percent over the same period.

In the absence of CES 2004-05 results on the mixed reference period used in 1999-2000, Himanshu presents estimates of head count ratio on mixed reference period based on the (abridged) one-page schedule canvassed in the NSS 55th and the 61st Round Employment-Unemployment Surveys (EUS), for 1999-2000 and 2004-05. These show an over nine percentage point decline in rural HCR (From 34.0 to 24.9 percent) and a near four percentage point decline in Urban HCR (from 28.9 to 25.0 percent), between 1999-2000 and 2004-05. If one accepts both these results, then, the inference is obvious: that virtually all of the decline in poverty between 1993-94 and 2004-05 took place between 2000 and 2005 with little or no decline in poverty between 1993-94 and 1999-2000.

In a recent paper by one of the authors (Sundaram, 2007) it has been argued that, at least at the all-India level, there is a better alternative to using the EUS for generating comparable poverty estimates for 1999-2000 and 2004-05, namely, the size-distribution of **households** on the mixed reference period presented in Tables 6R and 60 in the published CES report for 2004-05. This can be used directly to estimate, in the first instance, the proportion of households below the poverty line in 2004-05 with parallel estimates from NSS 55th Rural Consumer Expenditure Survey. And, corresponding to the proportion of **households** below the poverty line (from CES, 2004-05) we can derive the proportion of **persons** below the poverty line or head count ratios from the 61st Round EUS[1].

Using the official all-India poverty lines, it was shown (Sundaram, 2007) that, at the all-India level, the order of decline between 2000 and 2005 in the proportion of BPL-households (4.5 percentage points in rural India and 1.5 percentage points in urban India) and that in HCR for persons (respectively 4.3 and 1.5 percentage points in the two population segments) are roughly the same. It can be readily seen, that, these estimates of the order of decline in HCR (persons), between 2000 and 2005, based on official poverty lines and mixed reference period size-distribution of households from the 61st Rural CES are much smaller than Himanshu's estimates based on EUS for 1999-2000 and 2004-05. This suggests that the latter may need to be substantially revised downwards.

Using the methodology outlined above, but using our alternative poverty lines (updated by reference CPIAL and CPIIW for rural and Urban India), Table 13.6 presents comparable estimates on uniform reference period for 1993-94 and 2004-05 (Panel A) and on mixed reference period for 1993-94, 1999-2000 and 2004-05 (Panel B).

On a comparable basis, the order of decline in HCR between 1993-94 and 2004-05 are roughly the same on both uniform & mixed reference periods, with the decline under MRP being somewhat larger in rural India, and, somewhat smaller in urban India as well as for the total (rural plus urban) population.

On the mixed reference period, our estimates indicate a distinct slow-down in the pace of poverty decline in the first quinquennium of the 21st century relative to that between

1993-94 and 1999-2000. Between 1994 and 2000, rural HCR declined by 0.88 percentage points per year on the average and urban HCR by 0.55 per centage points per year. Normalised for base year levels, rural HCR declined at the rate of 2.7 percent per annum and urban HCR at the rate of 2.2 percent per annum.

In the first quinqnennium of this century, rural HCR declined by 0.6 percentage points per annum or at the rate of 2.1 percent per annum. In urban India, the corresponding numbers would be:0.05 percentage points, and, 0.2 percent, per annum.

As we have argued elsewhere, (Sundaram, 2007) this result of a slow-down in the pace of poverty decline between 2000 and 2005 relative to that between 1994 and 2000 is also consistent with the slow-down in real wages of workers rural India and an absolute decline in urban real wages between 2000 and 2005 (relative to the 1994-2000 period); and, with the virtually across-the-board slow-down in the growth of labour productivity between 2000 and 2005.

As such, our assessment of the poverty outcomes in India over the 1990s, that the poverty decline over this period is a reality rather than an artefact remains unaltered by the results from the NSS 61st Round Surveys for 2004-05.

Figure 13.1. All India Rural Lorenz Curve (NSS 50th Round)

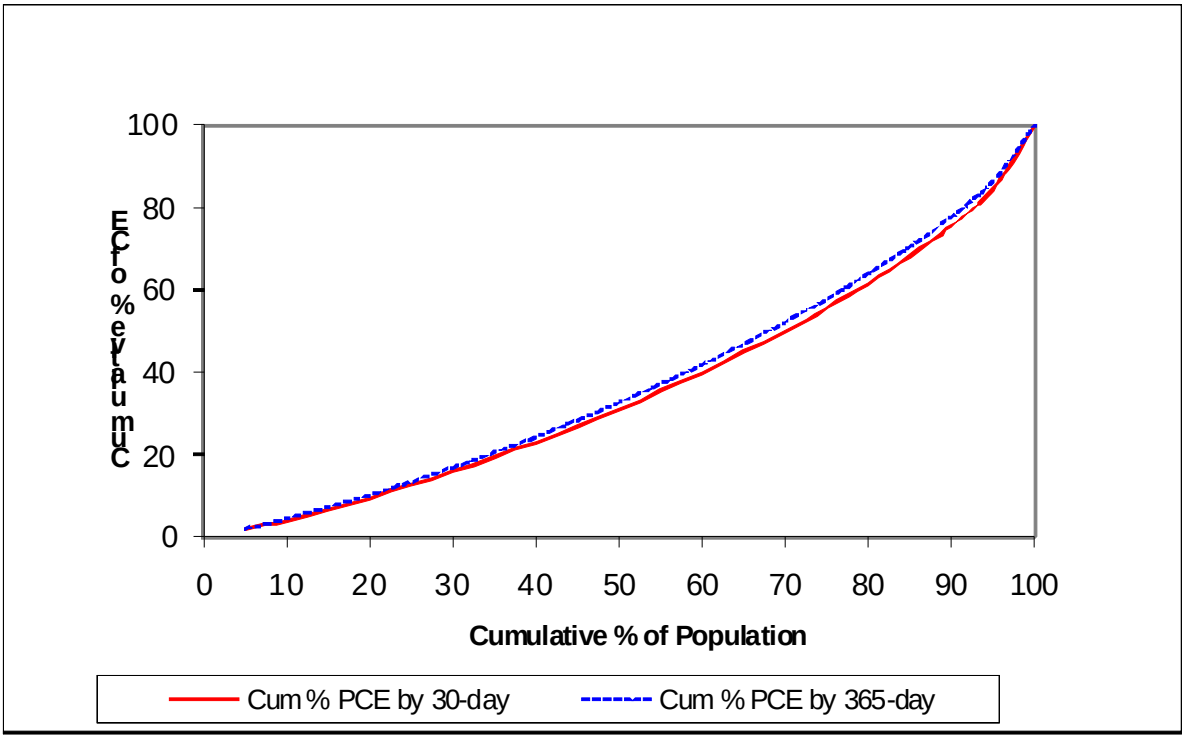
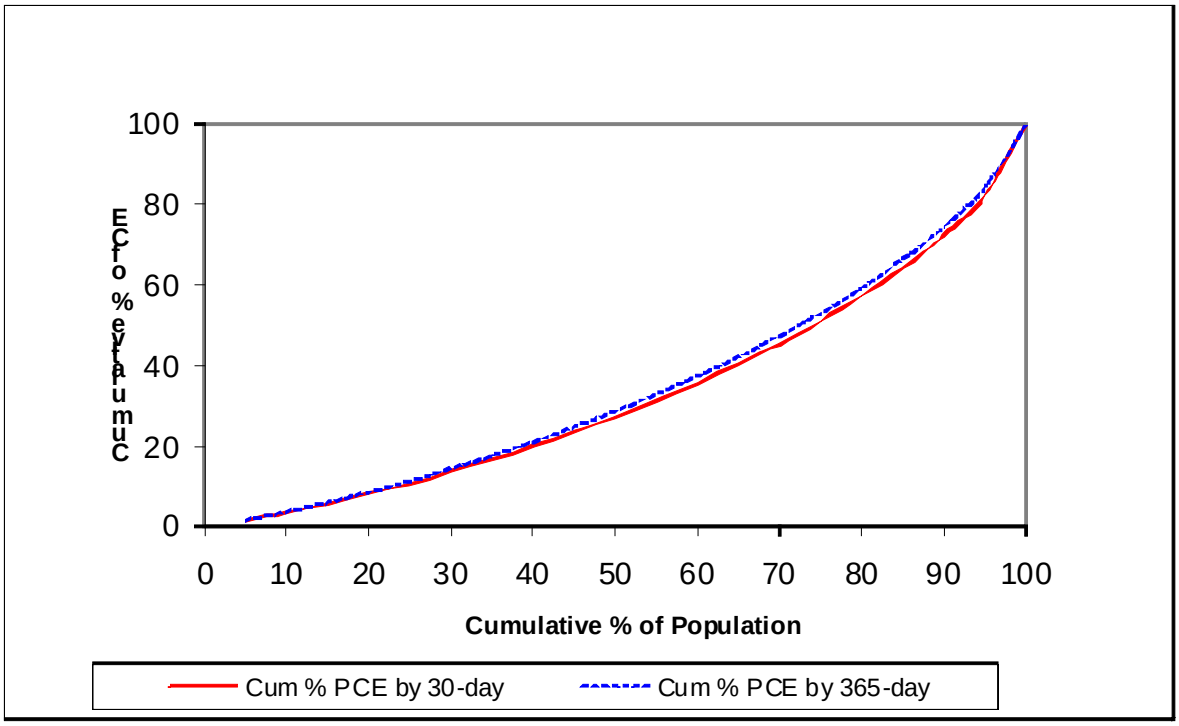


Figure 13.2. All India Urban Lorenz Curve (NSS 50th Round)



[*] This paper draws on a more detailed version due to be published in a volume titled, *Data and Dogma: The Great Indian Poverty Debate* edited by Angus Deaton and Valerie Kozel, Macmillan, Delhi (2005).A quick update has been added in a post-script to take account of the major results of the 61st round National Sample Survey for the year 2004-05

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[1] We will use 'food group' to denote food, beverages, paan, tobacco and intoxicants whereas 'total food' is used to denote the total for food and beverages only and excludes paan, tobacco and intoxicants.

[2] The initial instructions to NSS field staff did not explicitly mention the sequence in which information from respondents was to be elicited for the two recall periods. However, nearly one-and-a-half months after the field work was launched for the 55th round, a letter was sent by the sampling design and research division of NSSO, dated August 19, 1999, **asking the investigators to elicit information first for the 30-day recall for all items of the food group and then seek the same (again from the beginning) for the last 7 days.** Which sequence was in fact followed, however, remains an open question. We bypass this aspect of the issue by directly examining the outcome through a comparison of the CES estimates of monthly per capita expenditure (MPCE) on the specified items with the EUS-based estimates of MPCE canvassed with a single 30-day reference period – albeit with an abridged schedule.

[3] The only item-group where the percentage difference between the CES and EUS estimates, though less than the difference between the 7- and 30-day estimates, is

somewhat close to the latter, is milk and milk products. Like the item-group, 'Other Food' discussed below, this too is a somewhat heterogeneous item-group that accounted for less than 5 percent of total consumption for the lowest 30 percent of the rural population in 1993-94. For urban India, the corresponding proportion was a little over 7 percent (Sundaram and Tendulkar 2001).

[4] This is strictly not true in respect to two items forming a part of the category education. Unlike in the CES, two components, namely, tuition fees, and, newspapers, magazines, etc., have a 30-day reference period in the EUS, whereas they – along with school books and other educational articles – are all canvassed with a 365-day reference period in the CES. This could be a factor in explaining why the EUS estimates exceed the CES estimates.

[5] Ideally, one would have preferred to have set-up a similar comparison in respect of fractile-groups formed after excluding the expenditures on the items on the 365-day recall. Unfortunately, the unit record data for the NSS Rounds 51 thru 54 provide information only on the 30-day reference period. Efforts are on in this regard

[6] We hold the view that it is important to normalise the average annual decline by reference to the initial level value of the poverty indicator. Alternatively, one may opt for compound annual change which is also normalised in a similar fashion. Both procedures yield the same conclusion, namely, the pace of poverty decline was higher in the six-year period of 1990s than in the previous ten-and-a half years.

[1] A similar methodology was used by us earlier to analyse the poor in the Indian Labour Force (Sundaram and Tendulkar, 2003).

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