

# POVERTY AND INEQUALITY IN INDIA

## Getting closer to the truth

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*The 55<sup>th</sup> round of the NSS, which used a different methodology from all previous NSS rounds and arrived at lower poverty estimates, has confused about what happened to poverty and inequality in India during the 1990s. A consensus from earlier NSS rounds that poverty reduction had been setback during the 1990s was challenged. This was bolstered apparently by some ‘adjustments’, which although agreeing that the 55<sup>th</sup> round had overestimated poverty reduction, claimed that the number of poor had nonetheless fallen by 30-45 million. However, a detailed re-examination shows that these ‘adjustments’ got it wrong, and that the earlier consensus was correct after all. It is now certain that economic inequality increased sharply during the 1990s in all its aspects and, as a result, poverty reduction deteriorated markedly despite higher growth. It is most likely that the number of poor increased during the decade. This has implications for policy, and lessons for future survey design.*

### I. THE ISSUES AND THE BACKGROUND

In an earlier paper [Sen (2000)], published before release of final results from the National Sample Survey (NSS)’s 55<sup>th</sup> Round (1999-00), one of the present authors had warned that estimates of consumption expenditure and of poverty from this round would be controversial. In particular, it was pointed out that:

- (i) reference periods in the Consumer Expenditure Survey of the 55<sup>th</sup> Round were changed from the uniform 30 day recall used till then to *both* 7 and 30 day questions for items of food and intoxicants and *only* 365 day questions for items of clothing, footwear, education, institutional medical expense and durable goods;
- (ii) this change followed nine NSS rounds during 1990-98 (rounds 46 to 54) in each of which poverty, particularly rural, was found higher than in round 45 (1989-90), attracting influential criticism that NSS consumption estimates, which *are* lower than from National Accounts, were diverging increasingly during the 1990s;
- (iii) this criticism had very little factual basis since the 1990-97 growth rate of nominal consumption expenditure from the NSS was almost identical to that from the then current National Accounts series (NAS) with 1980-81 base and since 1990s NSS growth of rural consumption also agreed with the implicit NAS growth of rural incomes; but both NAS and NSS methodologies were changed thereafter;

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- (iv) the existing NAS series was replaced by a new series (base 1993-94) in 1999, which implied higher 1990s growth of both consumer expenditure and rural incomes; this lent some ex-post credibility to claims of increased NSS-NAS divergence but underlying this were huge upward revisions to production and consumption estimates of fruits and vegetables that were both arbitrary, i.e. not based on reliable data, and implausible;
- (v) an experimental schedule with 7 day reference period for food and intoxicants and 365 day reference period for clothing, footwear, education, institutional medical expenses and durable goods had been canvassed during NSS rounds 51 to 54 (i.e. 1994-98), independently of the standard 30 day schedule, to assess how choice of reference periods affects estimates of consumer expenditure and its distribution;
- (vi) the result from these experiments was that use of these alternative reference periods reduced measured poverty very sharply, by about half: the 7 day reference period for food etc. increased estimated consumption of these items by about 30 per cent and the 365 day reference period for clothing etc. made the distribution of consumer expenditure much more equal, increasing the share of the poorest 40 per cent by nearly 10 per cent;
- (vii) however, lacking any in-survey benchmark, these experiments could not establish which recall was closer to truth and conflicting criteria were used: 7 day questions were included for food etc. despite higher standard error of estimates since these were closer to NAS than 30 day estimates, but 365 day estimates for clothing etc, which were further from NAS, were preferred because of lower variance; both changes were towards lowering measured poverty and in “a last minute compromise” the final choice retained the 30 day questions for food etc.

In anticipation of full 55<sup>th</sup> round results, the paper had validated 1990s NSS data, pleaded against allowing users’ priors to interfere in statistical design of data generation, and argued for a new “large sample” survey with uniform 30day recall. It was shown that inclusion of both 7 and 30 day questions for food etc. had led to “contamination”, i.e. had made either or both non-comparable with previous estimates using corresponding recalls, and that contradictory conclusions were possible about the direction of poverty change depending on the reference periods compared.

In the event, there has been no subsequent survey using the uniform 30day reference period. The Planning Commission had, therefore, to base its official poverty estimates on the 55<sup>th</sup> round’s 30day recall for food etc. This implied apparently that All-India poverty incidence had declined by 10 percentage points and the number of poor had reduced by about 60 million since 1993-94 (i.e. the previous “large sample” 50<sup>th</sup> round). However, while releasing these, the Commission drew attention to “changes in methodology of data collection” and qualified that “estimates may not be strictly comparable to earlier estimates of poverty”.

Since then, a sizeable literature has grown up on the 55<sup>th</sup> round. This was discussed intensively at a seminar organised by the National Sample Survey Organisation (NSSO) in May 2001 and was the subject of a joint Planning Commission-World Bank workshop in January 2002. Although several interesting papers examined trends and regional patterns taking the 55<sup>th</sup> round data as such, and important new data and analysis were made available by the NSSO on the choice of reference periods and on NSS-NAS comparability, both discussions were dominated by the issue of how comparable the 55<sup>th</sup> round was with previous NSS rounds. Interestingly, frequent references were made in this context to the paper mentioned above with no one questioning any of the points listed earlier, including that there was little validity in the criticism of 1990-97 NSS data which forced the abrupt change in methodology. There was unanimity that the 55<sup>th</sup> round was non-comparable with previous rounds and that official figures had overestimated poverty decline. However, differences emerged on how much the 55<sup>th</sup> round may have underestimated poverty and indeed on

whether it was even possible with available data to put numbers on what actually happened. Nonetheless, the then World Bank Chief Economist reflected the dominant view at the 2002 workshop accurately when he closed this by observing that poverty had probably declined during the 1990s, although he then surprised by stating that this could have been by “about ten percentage points”, i.e. by about the same as if the 55<sup>th</sup> round had been fully comparable with earlier rounds!

The incredible implication – that after all this the methodological changes in the 55<sup>th</sup> round did not matter – was of course a slip, but minor. It was more accurately slight exaggeration of results from two serious attempts to “correct” the 55<sup>th</sup> round for changes in methodology. Final versions and extensions of these papers [Sundaram & Tendulkar (2003a and 2003b), Deaton (2003a and 2003b) and Deaton & Dreze (2002)] have been published. Using 55<sup>th</sup> round Consumer Expenditure and Employment-Unemployment Surveys, Sundaram-Tendulkar (S-T) denied that presence of 7 day questions on food etc. inflated 30 day responses. And, while agreeing that 365day questions for clothing etc. did reduce measured inequality, offered “comparable” estimates from the 50<sup>th</sup> round (in which both 365 and 30 day questions were asked for these items) that implied 8.2 percentage points reduction in the All-India headcount ratio. Deaton used a different method, exploiting the fact that only 30 day questions were asked for some non-food items in both rounds and assuming that probability of being poor has a stable relationship with spending on these. His “adjusted” 55<sup>th</sup> round All-India headcount ratio was 7 percentage points lower than in 50<sup>th</sup> round. Since Deaton apparently corrected for 7day questions also, these reinforced each other to imply that poverty reduction during the 1990s was no less than earlier. These reversed the pre-55<sup>th</sup> round consensus.

The present paper reports a detailed re-examination of NSS data of poverty and inequality during the 1990s, beginning with a critical appraisal of the methods adopted by S-T and Deaton. This was done, first, because uncritical acceptance of these may privilege ex-post data adjustments over the crucial statistical priority of maintaining comparability at the data generation stage, and, second, because these results were *prima facie* implausible. In particular:

- (i) The earliest problem noted about the 55<sup>th</sup> round Consumer Expenditure Survey (CES) was that although poverty reduced sharply by its 30 day estimates for food, this *increased* when its 7 day food estimates were compared to previous surveys using the same recall (Sen, 2000). In an effort to resolve this, Sundaram (2001) used data from the abridged consumption schedule of the 55<sup>th</sup> round Employment-Unemployment Survey (EUS) that asked *only* 30day questions for food etc. He noted that schedule abridgement may have overestimated poverty in EUS, but that it too showed poverty reduced - by 2.7 percentage points all-India between rounds 50 and 55. Thus, S-T used EUS originally, not to argue against contamination in CES, but to circumvent this. At the 2001 seminar, Sen (2001) had observed that the poverty decline from EUS was not robust, since experiments in rounds 51-54 suggested that the 365 day recall for clothing etc. used in it reduced measured poverty *by 4 to 6 percentage points* compared to the 30 day recall.
- (ii) During this stage of the debate, when the primary focus was on “contamination” from 7day food questions to 30day answers, the NSSO released 55<sup>th</sup> round Report No. 471 on Nutritional Intake, showing increase in the proportion of people reporting inadequate nutrition. Meenakshi and Vishwanathan (2003) presented a similar result at the 2002 workshop. Since this result was from CES, in which food estimates were if anything inflated, this not only implied increase in nutrition poverty but also, given the large measured reduction in income poverty, a significant shift from food to non-food even among the poor. Quite apart from the welfare problem of choosing between conflicting poverty criteria, this ran counter to Deaton’s assumption of a stable relationship between poverty and non-food spending.

- (iii) At the 2002 workshop, Datt, Kozel and Ravallion (2003) had reported projections from an econometric model fitted to data till 1993-94 that implied only 40 per cent of poverty reduction obtained by comparing unadjusted data from the 50<sup>th</sup> and 55<sup>th</sup> rounds. Although parametric projection with out-of-survey variables is different from Deaton's non-parametric method to derive "adjusted" estimates from in-survey data on a subset of comparable items, both involve implicit models and require relational stability. Both confirmed 55<sup>th</sup> round underestimation of poverty, but the large conflict in orders of magnitude suggested that much of this might not have been adjusted for by Deaton (and S-T who claimed even larger poverty reduction).
- (iv) A very important point, noted by both Deaton-Dreze and S-T, is that although unadjusted data show inequality reduced between rounds 50 and 55, this *increases* on adjusting for the 365 day reference period. For example, against Gini indices for Rural India of 28.6 and 26.3 from unadjusted 50<sup>th</sup> and 55<sup>th</sup> round, Sundaram-Tendulkar (2003a)'s "comparable" 50<sup>th</sup> round Gini was only 23.8. But, very oddly, this was not reflected in their "comparable" poverty estimates. It should be noted that rural poverty declines only 7 percentage points when the 50<sup>th</sup> round distribution with uniform 30 day recall is scaled up to 55<sup>th</sup> round mean per capita consumption. Any inequality increase should have implied lower poverty decline than this, by about one percentage point per Gini-point increase. Yet, S-T claimed 9 percentage point decline in comparable rural poverty while reporting 2.5 Gini-point increase in comparable inequality. Deaton's "adjusted" 7 percentage point rural poverty decline was also inconsistent with any increase in rural inequality.

In addition to these inconsistencies arising from non-sampling biases of recall, the discussion on the 55<sup>th</sup> round raised the issue of sampling biases, both in the 55<sup>th</sup> round and in other NSS rounds, especially the "thin samples". This issue of sampling bias is not a primary concern here, but it cannot be avoided without ducking the matter of viewing the 55<sup>th</sup> round in the context of nearby rounds. Although the inconvenient "thin samples" were ignored in the defence of 55<sup>th</sup> round poverty estimates except partially by Deaton-Dreze, any re-examination must take into account the recently released thin sample NSS 56<sup>th</sup> and 57<sup>th</sup> rounds, which retained only the 365 day recall for low frequency purchases such as clothing etc. but used *only* the 30 day recall for food etc.

At the outset it must be stated that the re-examination carried out in the light of the above was on comparability and consistency of NSS data and not their validity. The principal motivation was to assess the consensus that seemingly emerged after the 55<sup>th</sup> round against the pre-55<sup>th</sup> round consensus. Moreover, since the matter is sensitive, earlier versions of this paper were circulated widely in order to arrive at some general agreement on its technical content. In particular, clarification was sought on two points that had emerged fairly early in this research and which taken together was strong evidence against the consensus from Sundaram-Tendulkar and Deaton-Dreze. First, that S-T had erroneously underestimated (by over 50 percent) the difference in poverty ratios obtained from uniform 30day and mixed 30-365day recalls in the 50<sup>th</sup> round. Second, that Deaton's adjustment, which among other things aimed to correct the likely upward bias in 55<sup>th</sup> round food estimates due to its 7-day questions, had in fact *increased* these further.

Sundaram and Tendulkar (2003c) have acknowledged inadvertent error. In correction, they have reduced their estimate of poverty reduction between rounds 50 and 55 from 8.2 to 4.8 percentage points or by over 30 million people. Also, Angus Deaton has communicated that his method does unexpectedly involve an implicit *upward* revision of 55<sup>th</sup> round food expenditures. In absence of evidence that the 55<sup>th</sup> round had underestimated comparable food expenditure, this confirms that Deaton (and Deaton-Dreze) also overestimated poverty reduction between rounds 50 and 55. It is therefore now agreed that these adjustments reported at the 2002 workshop (and published in

*Economic and Political Weekly*) did not gauge fully the 55<sup>th</sup> round overestimation of poverty reduction. Further, during course of research, Peter Lanjouw drew attention to work-in-progress at the World Bank [Kijima and Lanjouw (2003)] that suggested even less reduction of poverty ratios between these rounds than reported in the present paper. Consequently, adjustments made in this paper for contamination from 7day food questions in the 55<sup>th</sup> round to its 30day estimates could be conservative, and this is also suggested by some recent NSSO comparisons of 52<sup>nd</sup> round short and full schedules. Nonetheless, these have been retained to inform a wider audience on ongoing research into this important subject, the literature on which has involved some rather misleading use of hyperbole, creating confusion in both academia and policy circles.

This paper is organised as follows. Section II presents “comparable” estimates following Sundaram-Tendulkar (S-T). However, this needs to be justified and involves two steps:

- (i) First, to obtain 50<sup>th</sup> round estimates using its 365day, rather than 30day, reports for clothing, footwear, durable goods, education and institutional medicine; and check comparability against the 55<sup>th</sup> round that used *only* 365day recall for these items. It is found that distributions are not comparable, but poverty estimates are. Avoiding S-T’s error, 50<sup>th</sup> round poverty using MRP is placed at 30.6 percent All-India, against 35.9 percent using URP. Estimates are also obtained for 43<sup>rd</sup> round, which used both 30 and 365day recalls for clothing, footwear and durables.
- (ii) Second, to correct 55<sup>th</sup> round estimates of food and intoxicants for possible “contamination” from 7day questions. This too follows S-T, i.e. use of 55<sup>th</sup> round Consumer Expenditure and Employment-Unemployment Surveys to arrive at a judgement. However, S-T’s argument that there was no contamination is found wanting, and the analysis here goes on to use their results and information from nearby NSS rounds to arrive at some estimates. At its *lower* bound, the extent of such “contamination” does turn out to be small. But even this implies 55<sup>th</sup> round All-India poverty incidence using MRP to be 27.8 percent as against 26.1 percent officially.

Comparable All India MRP poverty ratios are thus found to decline but, although official poverty lines are used, trends are very different from official estimates. The measured decline between 1993-94 and 1999-99 is *at most* only 2.8 percentage points implying *increase* in the number of poor, as against 9.8 percentage points and decline of about 60 million officially. Moreover, by these MRP estimates, the poverty ratio declined less during 1993-94 to 1999-2000 than during 1987-88 to 1993-94. Since annual reduction in the poverty ratio using comparable official estimates had already come down to less than half during 1987-88 to 1993-94 than achieved during 1977-78 to 1987-88, *there can be little doubt that poverty reduction did suffer a serious setback in the 1990s*, at least so long as NSS data and official poverty lines are accepted.

In section III, Deaton’s adjustment is examined in this light and is shown to fail because of shifts in consumption patterns from food to non-food. Contrary to the known direction of bias, Deaton’s procedure actually involved upward revision to 55<sup>th</sup> round food estimates, leading to estimates of poverty reduction larger than from direct MRP comparison. However, a slight modification of his method also leads to estimates close to the estimates described above. Section IV extends the comparison of rounds 50 and 55 to the level of NSS regions and considers some alternative adjustments with a view to assess what disaggregated conclusions are possible. In Section V, these estimates are put in the context of longer time series, including data from subsequent 56<sup>th</sup> and 57<sup>th</sup> rounds, to examine the growth and distribution aspects that underlie the poverty changes.

An important finding of this paper is that on proper comparison 55<sup>th</sup> round results agree reasonably with trends from other NSS rounds during the 1990s, testifying to integrity of NSS field operations

in face of fairly severe methodological shocks. Although it is necessary to calibrate both sampling and non-sampling biases further, it is the pre-55<sup>th</sup> round consensus that is found consistent, not its attempted revision. This restores and gives confidence to the earlier assessment that poverty had increased significantly in the early 1990s when growth had faltered during crisis and stabilisation, and that poverty reduction has been held back during the subsequent growth recovery because of increased inequalities. In fact, later NSS rounds, i.e. 56 and 57, confirm a very significant trend for inequalities to increase in almost all dimensions, particularly from the mid-1990s. However, the main lesson from post-55<sup>th</sup> round research is that poverty estimates are very sensitive to both survey design and post-survey analysis. For poverty monitoring to be credible, not only should survey design be stable and kept free from users' priors, some non-survey issues need urgent reopening, e.g. the poverty lines currently in use and the procedures to update these.

## ON COMPARABILITY OF THE 55<sup>th</sup> ROUND

The following are the uncontested facts regarding comparability problems of the 55<sup>th</sup> NSS round that arose as result of a changed choice of reference periods:

- (a) Official distributions and poverty ratios before the 55<sup>th</sup> round were based on data using the uniform 30day reference period for all items (URP). The 55<sup>th</sup> round Consumer Expenditure Survey (CES) used *only* the 365day reference period for five low frequency items (i.e. clothing, footwear, durable goods, education and institutional medicine) and used *both* 30 and 7day reference period for food and intoxicants. Since no data was collected by the 30day recall for low frequency items in the 55<sup>th</sup> round, URP estimates are not available from this round. Official 55<sup>th</sup> round distribution and poverty estimates use its 365day recall for the low frequency items and 30day recall for all other items, including food and intoxicants. This 30-365 day Mixed Reference Period (MRP) of the 55<sup>th</sup> round is not comparable to URP from previous rounds. Subsequent thin sample NSS rounds 56 and 57 have also used this MRP but did not ask 7day questions on food and intoxicants.
- (b) Although official estimates before the 55<sup>th</sup> round used only the URP, and thin samples before 50<sup>th</sup> round did not ask any 365 day questions, questions on the five low frequency items were asked by *both* 30 and 365 day recalls in the thick sample 50<sup>th</sup> round. It is therefore possible to obtain directly, from unit level data of 50<sup>th</sup> round, distributions and poverty rates using the MRP that was used officially in the 55<sup>th</sup> round. Although not identical, MRP estimates can also be obtained from the previous thick sample, i.e. the 43<sup>rd</sup> round, in which both 30 and 365 day questions were asked for three of these low frequency items (i.e. for clothing, footwear and durable goods).
- (c) However, while part of the comparability problem can thus be resolved objectively, MRP estimates from the 50<sup>th</sup> and 55<sup>th</sup> round CES could still remain non-comparable despite their identical reference periods. This is because of possible “contamination”, i.e. influence of questions by one recall on answers by another. First, 365day answers on low frequency items in the 50<sup>th</sup> round may have been affected by presence of the 30day questions on these items that were not present in the 55<sup>th</sup> round. Second, 30day answers on food and intoxicants in the 55<sup>th</sup> round CES may have been affected by presence of the 7day questions on these that were not present in the 50<sup>th</sup> round. No direct and objective resolution is possible of these.
- (d) Although the direction of bias of how 30 and 365 day recalls affect expenditure reports on low frequency items is known, no in-survey test has been carried out of how answers to 365day questions are affected by presence or absence of 30day questions in the same questionnaire. Besides previous thick sample rounds such as 43 and 50 where both 30 and 365 day questions were asked to the same informants, the only other rounds where estimates were collected by both these recalls are the thin sample rounds 51 to 54 where these were put to two independent samples. Relative results from these two sets of contemporaneous 30 and 365 day estimates, i.e. rounds 43 and 50 on the one hand and rounds 51 to 54 on the other, are the only information available to assess this.
- (e) Similarly, although it is known that reported expenditure on food and intoxicants is much higher by the 7day than the 30day recall, no proper in-survey assessment has been done of how presence or absence of 7day questions affect response to 30day questions. While both 7 and 30day questions were put to the same respondents in the 55<sup>th</sup> round CES, the 55<sup>th</sup> round Employment-Unemployment Survey (EUS) did simultaneously collect data using only 30day questions on food expenditure. But the EUS used an abridged schedule and its estimates may therefore not be comparable with those obtained from the full CES schedule. Nonetheless,

comparison of results from 55<sup>th</sup> round CES and EUS with each other and with results of other nearby NSS rounds remains the only available method of assessing this.

The main thrust of Sundaram & Tendulkar (2003a and 2003b) was to argue that “contamination” was unlikely and that 50<sup>th</sup> round estimates obtained by following step (b) above are “comparable” to 55<sup>th</sup> round CES. They rebuilt the required 50<sup>th</sup> round distribution of consumer expenditure from unit-level data. But, as mentioned in the introduction, S-T erred with regard to this step. As result of an oversight, expenditure on non-institutional medical care was excluded, underestimating total expenditure and overestimating 50<sup>th</sup> round poverty<sup>2</sup>. Comparing these erroneous estimates to the 55<sup>th</sup> round CES they concluded that rural and urban poverty ratios had declined by 8.9 and 5.7 percentage points respectively. Since this implied that the number of poor had reduced by nearly 45 million, they claimed “greater improvement in the poverty situation in the 1990s than in the previous ten-and-half-year period”, thus largely vindicating official estimates.

However, on receiving results of this paper, Sundaram and Tendulkar (2003c) have revised their estimates of “comparable” poverty. Although they continue with hyperbole of “better performance in poverty reduction in the 1990s”, their revised estimate of 4.8 percentage points decline in All-India poverty ratio during 1993-2000 is not only *less than half* the official decline but implies less annual reduction than during the 1980s<sup>3</sup>. Also, although they report absolute numbers of poor reduced, their revised estimate of 13 million is *well below quarter* of that measured officially.

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<sup>2</sup> The NSS Compact Disk on 50<sup>th</sup> round Consumption Expenditure Survey (CES) contains 14 data files, aggregating to about 2 Gigabytes of information, in addition to details on multipliers and documentation. Of these, two relatively small files D376SUMR and D376SUMU aggregating 43 Megabytes, contain unit-level summary information that the NSSO had generated for tabulation purposes from the other detailed files. Since the data layout on item-wise consumption in these summary files correspond to a summary block in the original questionnaire, and appear to contain information by both 30 and 365 day recalls for items on which a 365 day question was asked, these seem to be the obvious source files from which to obtain the alternative 50<sup>th</sup> round distributions. Sundaram-Tendulkar used these. However, on closer examination of the data, it turns out that these summary files return incorrect estimates of the alternative 50<sup>th</sup> round distributions using the 365day recall. This is because while these files contain the requisite information to replace the 30day responses by 365day responses in case of clothing, footwear and durable goods, this is not possible for education and institutional medicine. In fact, data on education and medical expenses are aggregated together in these files, and are put in the data fields for education leaving empty the fields for medical care, probably because the break-up was not required in the NSSO tabulation plan to which these summary files were input. As a result, although separate data fields exist for 30 and 365 day entries under education and medicines, since only 30 day questions were asked on non-institutional medicines, expenditure on this is included in the aggregated entry with 30 day recall but excluded from the aggregated entry with 365 day recall. It is, therefore, not possible in these files to isolate the expenditure on non-institutional medical care and this gets dropped altogether if the 30 day aggregate entries on education and health are replaced by the corresponding 365 day entries. Sundaram and Tendulkar did not notice this. Consequently, their 50<sup>th</sup> round MRP estimates excluded non-institutional medical expenses, which account for 4 per cent of total consumer expenditure, and correspondingly overstated 50<sup>th</sup> round poverty “comparable” to the 55<sup>th</sup> round. Luckily, however, this oversight can be rectified. The data on both education and medical expenses were collected in Block 8.1 of the original 50<sup>th</sup> round questionnaire, and the detailed unit-level information from this are contained in files D150L89R and D150L89U of the 50<sup>th</sup> round CES CD. The summary files can be made complete by entering data from these more detailed files into the separate fields for education, institutional and non-institutional medical care, distinguishing further between the 30 and 365 day responses on the first two of these.

<sup>3</sup> Sundaram and Tendulkar (2003c) continue to make this claim while reporting corrected 50<sup>th</sup> round MRP results, and base this on some comparisons of poverty reduction during 1993-94 to 1999-00 and 1983 to 1993-94. But this is hyperbole since the opposite also follows from their estimates. S-T had earlier reported URP (rural+urban) headcounts of 51.9, 46.5, 42.8, 36.2 and 37.4 using their poverty lines for rounds 32, 38, 43, 45 and 50. They now report MRP counts of 32.1 and 27.3 for rounds 50 and 55. If their 50<sup>th</sup> round URP-MRP difference is taken to be valid for 55<sup>th</sup> round also, the 1999-00 URP count is 32.6. The implied poverty reduction rates are 1.3 percentage points per annum during 1977-1990, 0.9 during 1983-1994, 0.8 during 1993-2000 and only 0.4 during 1989-2000. These also imply that, even ignoring 55<sup>th</sup> round contamination, the number of poor *increased* 27 million between 1989-90 and 1999-00 or over the “1990s” as usually understood, after *decrease* of more than 30 million during the previous twelve years.

Thus, what they now report is no longer vindication of official estimates but huge differences with these. Further, such large differences are obtained still assuming that there was no “contamination” from the 7day questions on food and intoxicants asked in the 55<sup>th</sup> round.

**TABLE 1a: KEY RESULTS FROM UNIFORM AND MIXED RECALLS: 43<sup>rd</sup> ROUND RURAL**

	MONTHLY PER CAPITA CONSUMER EXPENDITURE				GINI INDEX	POVERTY MEASURES			
	Poorest 40%	Next 40%	Richest 20%	All		National Poverty Line	State-specific Poverty Line		
						Headcount Ratio	Head-count Ratio	Poverty Gap	Squared Poverty Gap
<b>Uniform 30 day Reference Period</b>									
Andhra Pradesh	88	149	322	158.90	30.9	40.0	21.0	4.4	1.4
Assam	104	156	275	158.80	23.0	27.7	39.4	7.5	2.0
Bihar	84	131	246	134.90	25.6	48.7	53.9	12.9	4.5
Gujarat	101	161	304	165.64	26.1	28.4	28.3	5.4	1.6
Haryana	125	215	428	221.44	29.2	13.9	15.4	3.6	1.3
Karnataka	85	145	295	150.78	29.7	41.2	32.6	7.9	2.8
Kerala	112	194	434	209.18	32.1	19.7	29.3	6.3	2.0
Madhya Pradesh	79	133	270	138.45	29.2	49.6	42.0	10.6	3.8
Maharashtra	88	145	323	157.96	31.2	40.6	40.9	9.6	3.2
Orissa	77	127	239	129.23	26.9	53.0	58.7	16.3	6.2
Punjab	135	228	472	239.66	29.7	9.6	12.8	2.0	0.5
Rajasthan	93	167	351	174.33	31.5	31.8	33.3	8.6	3.4
Tamilnadu	82	145	328	156.38	33.0	44.3	46.3	12.6	4.8
Uttar Pradesh	86	143	291	149.89	28.8	42.9	42.3	10.0	3.3
West Bengal	93	147	275	151.04	25.8	36.6	48.8	11.6	4.0
<b>All India</b>	<b>88</b>	<b>150</b>	<b>312</b>	<b>157.69</b>	<b>29.9</b>	<b>39.0</b>	<b>39.0</b>	<b>9.3</b>	<b>3.2</b>
<b>Mixed 30/365 days Reference Periods</b>									
Andhra Pradesh	92	150	286	153.72	26.9	36.7	17.7	3.4	1.1
Assam	108	161	277	163.19	22.2	24.1	34.8	6.2	1.6
Bihar	88	134	229	134.71	22.7	44.1	49.4	11.1	3.7
Gujarat	109	172	317	175.83	25.4	22.1	21.9	4.0	1.2
Haryana	135	220	388	219.18	25.1	10.1	12.5	2.5	0.9
Karnataka	85	145	292	150.64	29.2	40.5	32.0	7.7	2.7
Kerala	114	195	421	207.79	31.0	19.6	28.2	6.0	1.9
Madhya Pradesh	85	138	251	138.98	25.7	43.8	37.4	8.4	2.8
Maharashtra	95	151	285	155.31	26.1	34.6	34.9	7.4	2.3
Orissa	81	130	228	129.92	24.4	49.9	55.7	14.3	5.1
Punjab	147	237	453	244.11	26.8	5.3	8.0	1.1	0.3
Rajasthan	100	169	324	172.28	28.0	27.3	29.1	6.7	2.5
Tamilnadu	85	149	311	155.98	30.7	41.2	43.5	11.3	4.2
Uttar Pradesh	91	146	271	148.62	25.8	39.6	39.0	8.4	2.6
West Bengal	96	150	264	151.56	24.0	33.9	45.9	10.4	3.4
<b>All India</b>	<b>93</b>	<b>153</b>	<b>294</b>	<b>157.33</b>	<b>27.3</b>	<b>35.2</b>	<b>35.2</b>	<b>7.8</b>	<b>2.6</b>

**Source:** Unit-level data from NSS 43<sup>rd</sup> round.

**Note:** The MRP estimates are from distributions obtained using the 365day recall for clothing, footwear and durable goods and 30 days recall for all other items. The State-wise poverty lines used in columns 8 to 10 are those that were used by the Planning Commission based on the Expert Group methodology. The National poverty line implied by these is Rs 115.20 and is used in column 7. The All-India estimates in the table are those obtained by applying the national poverty line to the All-India distribution and need not correspond to the population weighted average of the State level poverty estimates.

**TABLE 1b: KEY RESULTS FROM UNIFORM AND MIXED RECALLS: 43<sup>rd</sup> ROUND URBAN**

	MONTHLY PER CAPITA CONSUMER EXPENDITURE				GINI INDEX	POVERTY MEASURES			
	Poorest 40%	Next 40%	Richest 20%	All		National Poverty Line	State-specific Poverty Line		
						Headcount Ratio	Head-count Ratio	Poverty Gap	Squared Poverty Gap
<b>Uniform 30 day Reference Period</b>									
Andhra Pradesh	112	204	509	228.07	36.1	45.7	41.1	10.6	3.9
Assam	143	237	522	256.15	31.0	28.7	11.3	1.5	0.3
Bihar	104	172	384	187.21	31.0	57.9	51.9	13.0	4.6
Gujarat	138	224	448	234.32	27.8	32.1	38.5	8.2	2.6
Haryana	143	249	483	253.46	28.7	36.9	18.4	3.6	1.1
Karnataka	113	208	477	223.50	34.0	45.1	49.2	14.1	5.7
Kerala	123	237	591	261.70	36.9	38.2	38.7	10.0	3.9
Madhya Pradesh	119	218	492	232.98	33.2	40.9	47.4	13.6	5.3
Maharashtra	131	262	580	273.18	34.8	30.6	40.5	12.4	5.2
Orissa	119	213	446	222.01	31.0	39.2	42.6	11.1	4.2
Punjab	157	267	531	275.67	28.8	21.0	13.7	2.3	0.6
Rajasthan	126	219	535	245.11	34.6	36.9	37.9	9.6	3.4
Tamilnadu	118	224	542	245.19	35.8	38.9	40.2	11.5	4.6
Uttar Pradesh	108	200	454	214.00	34.0	48.6	45.0	12.2	4.5
West Bengal	123	229	536	247.98	34.6	39.7	33.7	7.4	2.4
<b>All India</b>	<b>121</b>	<b>227</b>	<b>533</b>	<b>245.71</b>	<b>35.0</b>	<b>38.7</b>	<b>38.7</b>	<b>10.2</b>	<b>3.8</b>
<b>Mixed 30/365 days Reference Periods</b>									
Andhra Pradesh	118	210	458	222.78	32.0	42.8	36.3	9.0	3.2
Assam	150	248	474	253.72	27.2	24.6	10.2	1.1	0.2
Bihar	110	177	360	186.71	28.0	55.6	46.8	10.9	3.7
Gujarat	149	244	463	249.74	26.6	24.5	29.8	6.1	1.8
Haryana	155	267	486	265.89	26.9	21.2	13.7	2.6	0.7
Karnataka	120	214	441	222.04	30.6	38.8	43.4	12.0	4.7
Kerala	129	249	596	270.06	35.8	34.8	35.4	8.6	3.2
Madhya Pradesh	129	226	472	236.45	30.4	35.3	43.3	11.0	4.0
Maharashtra	140	273	561	277.43	32.4	27.3	36.3	10.5	4.2
Orissa	126	218	434	224.56	29.1	36.6	38.1	9.6	3.3
Punjab	167	274	528	282.16	27.3	16.3	10.4	1.6	0.4
Rajasthan	134	229	504	246.32	31.2	32.7	33.8	7.7	2.5
Tamilnadu	123	226	512	242.03	33.6	35.7	37.7	10.4	4.1
Uttar Pradesh	114	207	437	215.71	31.6	45.7	41.6	10.4	3.6
West Bengal	128	235	519	249.11	32.9	36.8	30.4	6.4	2.0
<b>All India</b>	<b>128</b>	<b>235</b>	<b>514</b>	<b>247.99</b>	<b>32.7</b>	<b>34.9</b>	<b>34.9</b>	<b>8.6</b>	<b>3.1</b>

**Source:** Unit-level data from NSS 43<sup>rd</sup> round.

**Note:** The MRP estimates are from distributions obtained using the 365day recall for clothing, footwear and durable goods and 30 days recall for all other items. The State-wise poverty lines used in columns 8 to 10 are those that were used by the Planning Commission based on the Expert Group methodology. The National poverty line implied by these is Rs 162.16 and is used in column 7. The All-India estimates in the table are those obtained by applying the national poverty line to the All-India distribution and need not correspond to the population weighted average of the State level poverty estimates.

**TABLE 2a: KEY RESULTS FROM UNIFORM AND MIXED RECALLS: 50<sup>th</sup> ROUND RURAL**

	MONTHLY PER CAPITA CONSUMER EXPENDITURE				GINI INDEX	POVERTY MEASURES			
	Poorest 40%	Next 40%	Richest 20%	All		National Poverty Line	State-specific Poverty Line		
						Headcount Ratio	Head-count Ratio	Poverty Gap	Squared Poverty Gap
<b>Uniform 30 day Reference Period</b>									
Andhra Pradesh	167	272	565	288.70	29.0	35.4	15.9	2.9	0.9
Assam	185	264	393	258.11	18.0	29.3	45.1	8.3	2.2
Bihar	143	219	368	218.30	22.6	55.3	58.0	14.7	5.1
Gujarat	192	304	526	303.32	24.0	23.9	22.2	4.1	1.2
Haryana	207	365	779	385.01	31.4	18.1	28.3	5.6	1.7
Karnataka	160	264	499	269.38	27.1	39.2	30.1	6.3	2.0
Kerala	218	371	773	390.41	30.1	15.3	25.4	5.6	1.8
Madhya Pradesh	147	243	479	252.01	28.0	46.5	40.7	9.5	3.3
Maharashtra	150	259	546	272.66	30.7	42.2	37.9	9.3	3.4
Orissa	138	216	391	219.80	24.7	56.7	49.8	12.0	4.1
Punjab	255	409	837	433.00	28.2	6.2	11.7	1.9	0.5
Rajasthan	194	317	590	322.39	26.5	22.3	26.4	5.2	1.6
Tamilnadu	162	272	600	293.62	31.2	36.6	32.9	7.3	2.5
Uttar Pradesh	158	266	521	273.83	28.2	39.5	42.3	10.4	3.5
West Bengal	175	267	509	278.78	25.4	33.3	41.2	8.3	2.5
<b>All India</b>	<b>162</b>	<b>271</b>	<b>541</b>	<b>281.40</b>	<b>28.6</b>	<b>37.2</b>	<b>37.2</b>	<b>8.5</b>	<b>2.8</b>
<b>Mixed 30/365 days Reference Periods</b>									
Andhra Pradesh	177	280	504	283.49	24.9	30.6	12.5	2.2	0.6
Assam	196	281	411	272.86	17.6	22.6	36.0	6.3	1.6
Bihar	153	231	367	227.15	20.9	48.8	52.9	11.8	3.9
Gujarat	206	328	527	319.08	22.3	18.3	16.6	2.9	0.8
Haryana	225	374	700	379.55	26.9	12.8	22.3	4.0	1.2
Karnataka	176	280	488	279.88	24.3	30.5	22.0	4.3	1.3
Kerala	232	386	732	393.75	27.2	11.3	21.9	4.4	1.4
Madhya Pradesh	161	257	459	258.78	25.0	38.8	32.8	7.0	2.2
Maharashtra	165	275	508	277.50	26.7	36.1	31.0	6.6	2.2
Orissa	146	222	375	222.49	22.4	53.0	45.6	10.0	3.2
Punjab	277	434	758	436.35	23.8	4.2	8.5	1.2	0.3
Rajasthan	212	330	568	330.38	23.5	16.6	19.2	3.4	0.9
Tamilnadu	172	283	563	294.72	28.2	31.5	28.1	6.0	2.0
Uttar Pradesh	170	275	494	277.10	25.2	34.1	37.3	8.1	2.5
West Bengal	184	279	502	285.98	23.8	27.9	35.5	6.7	1.9
<b>All India</b>	<b>174</b>	<b>283</b>	<b>519</b>	<b>286.58</b>	<b>25.8</b>	<b>31.6</b>	<b>31.6</b>	<b>6.6</b>	<b>2.1</b>

Source: Unit-level data from NSS 50<sup>th</sup> Round.

Note: The MRP estimates are from distributions obtained using the 365day recall for clothing, footwear, durable goods, education and institutional medical care and 30 days recall for all other items. The State-wise poverty lines used in columns 8 to 10 are those that were used by the Planning Commission based on the Expert Group methodology. The National poverty line implied by these is Rs 205.88 and is used in column 7. The All-India estimates in the table are those obtained by applying the national poverty line to the All-India distribution and need not correspond to the population weighted average of the State level poverty estimates.

**TABLE 2b: KEY RESULTS FROM UNIFORM AND MIXED RECALLS: 50<sup>th</sup> ROUND URBAN**

	MONTHLY PER CAPITA CONSUMER EXPENDITURE				GINI INDEX	POVERTY MEASURES			
	Poorest 40%	Next 40%	Richest 20%	All		National Poverty Line	State-specific Poverty Line		
						Headcount Ratio	Head-count Ratio	Poverty Gap	Squared Poverty Gap
<b>Uniform 30 day Reference Period</b>									
Andhra Pradesh	214	385	845	408.60	32.3	39.9	38.8	9.3	3.2
Assam	257	444	892	458.57	29.0	25.9	7.9	0.9	0.2
Bihar	192	333	714	353.03	30.9	50.1	34.8	7.9	2.6
Gujarat	258	437	879	454.18	29.1	24.4	28.3	6.2	2.0
Haryana	269	464	903	473.92	28.4	22.0	16.5	3.0	0.9
Karnataka	217	416	849	423.14	31.9	35.7	39.9	11.4	4.4
Kerala	253	448	1066	493.83	34.3	24.6	24.3	5.5	1.9
Madhya Pradesh	214	376	859	408.06	33.1	39.5	48.1	13.4	5.1
Maharashtra	247	507	1142	529.80	35.7	25.5	35.0	10.2	4.2
Orissa	213	396	793	402.54	30.7	36.5	40.9	11.4	4.3
Punjab	290	506	960	510.73	28.1	16.3	10.9	1.7	0.4
Rajasthan	236	416	820	424.73	29.3	31.1	31.0	7.0	2.2
Tamilnadu	221	397	957	438.29	34.8	35.7	39.9	10.2	3.9
Uttar Pradesh	201	369	804	388.97	32.6	42.3	35.1	9.0	3.3
West Bengal	235	450	1000	474.19	33.9	31.1	22.9	4.5	1.4
<b>All India</b>	<b>228</b>	<b>427</b>	<b>980</b>	<b>458.04</b>	<b>34.4</b>	<b>32.6</b>	<b>32.6</b>	<b>8.0</b>	<b>2.9</b>
<b>Mixed 30/365 days Reference Periods</b>									
Andhra Pradesh	225	399	817	413.06	30.3	35.0	34.2	7.9	2.7
Assam	275	463	922	479.73	28.3	18.9	4.6	0.7	0.2
Bihar	206	356	729	370.69	29.7	43.6	28.8	6.2	2.0
Gujarat	278	474	870	474.77	26.9	20.2	23.7	4.8	1.4
Haryana	290	488	906	492.97	26.7	17.0	10.0	2.0	0.6
Karnataka	234	441	861	442.10	30.4	31.0	36.0	9.2	3.3
Kerala	260	447	1007	484.07	32.3	21.8	21.5	5.0	1.7
Madhya Pradesh	232	392	811	412.02	29.7	32.5	43.4	10.8	3.8
Maharashtra	268	522	1128	541.70	33.5	20.5	30.2	8.1	3.1
Orissa	223	404	787	408.35	29.4	35.1	38.5	10.1	3.6
Punjab	308	522	953	522.90	26.5	12.3	7.6	1.3	0.3
Rajasthan	256	431	799	434.28	26.8	25.0	25.0	5.1	1.5
Tamilnadu	234	412	928	443.99	32.8	31.6	36.0	8.6	3.2
Uttar Pradesh	216	388	782	397.78	30.2	37.2	30.6	7.3	2.4
West Bengal	248	469	1018	490.47	32.7	27.8	18.2	3.5	1.1
<b>All India</b>	<b>243</b>	<b>446</b>	<b>948</b>	<b>464.83</b>	<b>31.9</b>	<b>27.9</b>	<b>27.9</b>	<b>6.5</b>	<b>2.2</b>

Source: Unit-level data from NSS 50<sup>th</sup> Round.

Note: The MRP estimates are from distributions obtained using the 365day recall for clothing, footwear, durable goods, education and institutional medical care and 30 days recall for all other items. The State-wise poverty lines used in columns 8 to 10 are those that were used by the Planning Commission based on the Expert Group methodology. The National poverty line implied by these is Rs 281.36 and is used in column 7. The All-India estimates in the table are those obtained by applying the national poverty line to the All-India distribution and need not correspond to the population weighted average of the State level poverty estimates.

Tables 1 and 2 present key results from rounds 43 and 50 by both URP and MRP. Unlike S-T, who use their own poverty lines, poverty estimates in these tables use official poverty lines in order to maintain consistency with a larger literature. But since doubts have been expressed about validity of state/sector cost of living differentials implicit in official State-specific poverty lines, headcount ratios are also presented applying national poverty lines uniformly over States. This poverty line choice has important bearing on matters such as inter-state allocation of anti-poverty resources, particularly for Andhra Pradesh and Assam, and is discussed later. The more pertinent and immediately relevant point from these tables is that the *MRP returns lower poverty than the URP, irrespective of round, state, sector or poverty measure used.*

The 50<sup>th</sup> round URP-MRP differences for All-India headcount ratios using official poverty lines, 5.6 percentage points rural and 4.7 percentage points urban, are almost exactly the same as S-T report after correction using their different poverty lines. It is this large URP-MRP difference that explains why on comparing the 55<sup>th</sup> round with the correct 50<sup>th</sup> round MRP they now accept so much less poverty reduction than official comparisons of the 55<sup>th</sup> round with the 50<sup>th</sup> round URP. Moreover, although the magnitude of the URP-MRP difference in poverty measures does vary somewhat across states, sectors and rounds, its underlying causes are systematic:

- (i) In all cases, i.e. irrespective of state, sector or round, the Gini ratio obtained from the MRP distribution is lower than obtained from the URP distribution.
- (ii) It is this greater equality of the MRP distribution than URP that drives results regarding URP-MRP differences in poverty, and not differences in means. Mean per capita consumption expenditure (MPCE) is higher with the URP than MRP in about a third of the cases reported above, but in every such case poverty by every measure is nonetheless higher using the URP.
- (iii) The greater equality of MRP distribution is obtained because in every case the bottom four quintiles of the population from this distribution report higher consumption than corresponding quintiles from the URP distribution, and because in the overwhelming majority of cases the top quintile from the MRP distribution reports lower consumption than from the URP distribution.
- (iv) The most important reason why reported consumption of poorer groups is higher by MRP than URP is because use of 30day recall for low frequency purchases elicits a very large percentage of zero responses. Such nil response to a short recall is quite natural for poorer respondents and is reduced very considerably on using the longer 365day recall. The frequency of zero response with URP, and its reduction with MRP, is particularly marked for the bottom 40 percent. For this fractile, the MRP-URP difference in MPCE is in almost all cases (i.e. except a few rural cases in round 43) found to lie within the relatively narrow range of 4 to 9 percent.
- (v) The reason why the top quintile reports lower consumption by MRP is less clear, but use of the longer recall does appear to lead to memory loss. In most cases, the average household in the top quintile reports higher expenditure on low frequency items during “last 30days” than the 30day equivalent of what the same household reports as its annual expenditure on these items.

These observations are relevant to assess comparability of the 50<sup>th</sup> and 55<sup>th</sup> round distributions using 30/365day recall, i.e. of possible “contamination” of 365day replies on low frequency items as result of the presence of 30day questions on these items in round 50 but not in round 55.

Sundaram and Tendulkar have asserted that the influence from one recall to another is unlikely since in the case of these low frequency expenditures since these are “salient in memory of

respondents”. But this is not correct. In the 50<sup>th</sup> round, reported average expenditure on these items was higher by the 365day recall, whereas in rounds 51 to 54, where the two recalls were used on separate samples, the 30day recall returned higher average expenditure on these items. This indication, that presence of 30day questions leads to higher 365-day answers, means that the 365-day estimates from the 50<sup>th</sup> round are not fully comparable with those from the 55<sup>th</sup> round.

**TABLE 3: PERCENTAGE CHANGE IN FRACTILE SPECIFIC MPCE DUE TO SHIFT FROM 30 DAY TO 365 DAY REFERENCE PERIOD BY ITEM**

NSS Round	RURAL				URBAN			
	Bottom 40%	Next 40%	Top 20%	All	Bottom 40%	Next 40%	Top 20%	All
<b>Clothing</b>								
43	5.3	2.6	-3.7	0.7	5.8	3.6	-1.7	1.7
50	6.6	4.2	-3.7	2.3	6.2	4.0	-1.5	2.6
51	5.3	2.1	-5.4	-0.1	6.3	3.2	-2.5	1.2
52	6.5	2.6	-6.8	-0.1	6.2	2.0	-5.2	-0.5
53	5.8	2.3	-5.1	0.1	5.7	2.5	-2.4	0.9
<b>Footwear</b>								
43	0.2	0.1	-0.6	-0.1	0.4	0.1	-0.4	0.0
50	0.5	0.4	-0.6	0.1	0.6	0.5	-0.2	0.3
51	0.5	0.2	-0.5	-0.0	0.8	0.6	-0.2	0.3
52	0.6	0.2	-0.9	-0.1	0.8	0.5	-0.8	-0.0
53	0.4	0.2	-0.9	-0.2	0.8	0.5	-0.3	0.2
<b>Durable Goods</b>								
43	0.6	0.3	-2.6	-0.8	0.4	0.8	-2.7	-0.8
50	0.7	0.5	-2.6	-0.4	0.5	0.5	-2.9	-0.6
51	0.3	0.1	-8.1	-3.1	0.3	0.4	-4.9	-2.0
52	0.4	0.0	-5.6	-2.0	0.4	0.5	-8.3	-3.4
53	0.2	0.2	-5.4	-2.0	0.4	1.0	-4.1	-1.4
<b>Above 3 items</b>								
43	6.1	3.0	-6.9	-0.2	6.6	4.5	-4.8	0.9
50	7.8	5.1	-6.9	2.0	7.3	5.0	-4.6	2.3
51	6.1	2.4	-14.0	-3.3	7.4	4.3	-7.6	-0.5
52	7.5	2.8	-13.3	-2.2	7.4	2.9	-14.3	-3.9
53	6.4	2.8	-11.4	-2.1	7.0	4.1	-6.9	-0.2
<b>Education</b>								
50	0.2	0.1	-0.4	0.1	0.3	0.1	-1.8	-0.3
51	0.1	-0.2	-0.7	-0.4	0.7	0.3	-1.3	-0.4
52	0.1	-0.3	-0.9	-0.4	0.5	-0.3	-3.4	-1.5
53	-0.6	-1.1	-1.1	-1.0	-0.2	-1.4	-3.1	-1.9
<b>Institutional Medicine</b>								
50	0.1	0.2	-1.2	-0.2	0.2	0.2	-1.7	-0.5
51	0.1	0.0	-1.3	-0.5	-0.1	0.1	-1.0	-0.5
52	0.4	0.2	-0.5	-0.0	0.4	0.1	-0.9	-0.3
53	0.1	0.2	-1.9	-0.7	0.2	0.3	-2.9	-1.1
<b>Above 5 items</b>								
50	8.1	5.5	-8.5	1.9	7.7	5.2	-8.0	1.5
51	6.2	2.2	-16.0	-4.1	7.9	4.7	-10.0	-1.4
52	8.0	2.7	-14.7	-2.7	8.3	2.8	-18.6	-5.8
53	5.9	1.8	-14.4	-3.7	7.0	3.0	-12.8	-3.3

**Note:** Each cell gives the value of  $100 * (c_{ij}^{365} - c_{ij}^{30}) / y_j^{30}$  by round/sector/item. Here,  $y_j^{30}$  is mpce using the uniform 30 day recall of the jth fractile group formed using mpce by this recall;  $c_{ij}^{30}$  is the 30 day consumption report on the ith item by the jth fractile group when fractiles are formed using the mpce by uniform 30 day recall; and  $c_{ij}^{365}$  is the 365 day consumption report on the ith item by jth fractile group when fractiles are formed using the mpce by mixed 30-365 day recall.

However, detailed analysis summarised in Table 3, of 43<sup>rd</sup> and 50<sup>th</sup> round differences between 30 and 365 day recalls with corresponding differences in rounds 51 to 53 shows this to be confined largely to the upper tail of the distribution<sup>4</sup>. The richest quintile not only report less consumption of low frequency items by the 365day than the 30day recall, the difference magnifies significantly when 365-day questions are asked without 30day questions. In round 50, the top quintile by MRP reported 75-80 percent of the spending on 365-day items than the top quintile by URP, but this ratio fell to half in round 51 to 53. This explains almost entirely why reported total consumption of these items was higher by MRP in the 50<sup>th</sup> round but higher by URP in rounds 51 to 53. On the other hand, presence or absence of 30-day questions does not appear to matter for the poorest 40% of population since, irrespective of this, 365day questions elicit many more non-zero replies. In particular, implied MRP-URP differences in MPCE for this fractile in rounds 51 to 53 are well within the 4-9 percent range found from rounds 43 and 50. Sundaram-Tendulkar are therefore correct that salience of low frequency purchases in respondents' memory makes influence from 30day questions to 365day answers unlikely for the majority of the population. But the rich are exceptions since they are frequent buyers of these items and do suffer memory lapse with the long reference period. This becomes more pronounced if not prompted by a shorter recall.

Certain important conclusions follow from this regarding the nature of "contamination" bias from the influence of 30day questions on low frequency items to the 365day replies on these:

- (a) First, since absence of 30-day queries lead to lower 365day reports of low frequency items by the top quintile who are major consumers of these items, measured MPCE with MRP is lower. This can affect survey-capture. Low frequency items already account for sizeable part of NAS-NSS difference, and expenditure on these items is increasing faster than total consumption.
- (b) Second, since absence of 30day queries reduces consumption reports of only the relatively rich, measured inequality is lower. Although inequality is reported less with MRP than URP in all rounds, Gini differences in rounds 43 and 50 were only about half that in rounds 51 to 53<sup>5</sup>.
- (c) Third, and crucially, since presence or absence of 30 day questions does not appear to affect the 365 day consumer expenditure estimates for the poorest 40 percent of population, poverty counts from the MRP of 50<sup>th</sup> round are almost fully comparable with the MRP in later rounds.

This closes discussion on comparability regarding 30 and 365 day recalls for low frequency items. Since 30day queries on these were dropped in 55<sup>th</sup> and subsequent rounds, the 365day recall in

<sup>4</sup> However, this analysis, although very strongly suggestive, cannot be conclusive. The NSS has so far not included a direct control to test how presence of 30day queries affects 365day answers within the same round. Moreover, rounds 51-54 had two schedules: one which used an uniform 30 day reference period and another which used not only the 365 day recall for low frequency items but also the 7 day recall for food and intoxicants. It therefore needs to be assumed that presence of 7day questions on food did not affect outcomes by the 365day recall for low frequency items. The analysis above has ignored the 54<sup>th</sup> round since this was only a half-year round and may be affected by seasonality. More generally also, only full year NSS rounds have been used in the rest of this paper.

<sup>5</sup> The Ginis being compared are from the MRP and URP of the 43<sup>rd</sup> and 50<sup>th</sup> round distributions reported above and from schedule types 1 and 2 in rounds 51 to 53. Inequality was lower by 2.5 and 2.8 Gini points by the mixed recall in urban and rural areas in the 50<sup>th</sup> round, and by 2.7 and 2.3 points in round 43, as against an average difference of 5.3 and 5.0 Gini points in urban and rural areas between schedules 1 and 2 of rounds 51 to 53. It should be noted, however, that the comparison is not exact since schedule type 2 in rounds 51 to 53 contained 7day questions on food.

these is similar to those in experimental schedules of rounds 51 to 53. Consequently, both MPCE and inequality are likely to have been underestimated in these later rounds as compared to MRP of rounds 43 and 50. Nonetheless, it must be accepted that Sundaram and Tendulkar were correct in treating poverty estimates from the 50<sup>th</sup> round MRP as a valid *objective* method of dealing with the 365-day issue. However, poverty comparisons from 55<sup>th</sup> round remain subject to problems created by the 7-day questions on food and intoxicants in its Consumer Expenditure Survey (CES).

**TABLE 4: HEADCOUNT POVERTY RATIOS BY THE 30/365 DAYS REFERENCE PERIODS**

	Using Official State-specific Poverty Lines					Using National Poverty Lines for all States				
	43rd MRP	50 <sup>th</sup> MRP-A	50 <sup>th</sup> MRP	55 <sup>th</sup> EUS	55 <sup>th</sup> CES	43rd MRP	50 <sup>th</sup> MRP-A	50 <sup>th</sup> MRP	55 <sup>th</sup> EUS	55 <sup>th</sup> CES
<b>RURAL</b>										
Andhra Pradesh	17.7	12.7	12.5	13.8	11.1	36.7	30.8	30.6	31.6	27.8
Assam	34.8	36.9	36.0	48.3	40.0	24.1	23.5	22.6	35.0	28.5
Bihar	49.4	53.1	52.9	51.9	44.3	44.1	49.0	48.8	49.7	42.2
Gujarat	21.9	17.1	16.6	18.5	13.2	22.1	18.8	18.3	20.5	14.7
Haryana	12.5	21.6	22.3	14.2	8.3	10.1	12.8	12.8	9.4	4.8
Karnataka	32.0	22.4	22.0	30.1	17.4	40.5	31.4	30.5	35.1	21.4
Kerala	28.2	22.4	21.9	17.6	9.4	19.6	12.3	11.3	10.3	4.9
Madhya Pradesh	37.4	33.4	32.8	43.9	37.1	43.8	39.6	38.8	49.6	41.8
Maharashtra	34.9	31.2	31.0	32.9	23.7	34.6	36.2	36.1	36.3	26.0
Orissa	55.7	45.3	45.6	54.3	48.0	49.9	52.3	53.0	55.7	49.3
Punjab	8.0	8.5	8.5	11.5	6.4	5.3	4.7	4.2	7.6	3.3
Rajasthan	29.1	20.0	19.2	17.5	13.7	27.3	16.5	16.6	14.0	11.0
Tamilnadu	43.5	28.3	28.1	31.5	20.6	41.2	31.8	31.5	37.0	25.6
Uttar Pradesh	39.0	37.7	37.3	35.7	31.2	39.6	34.6	34.1	32.9	28.6
West Bengal	45.9	35.6	35.5	43.8	31.9	33.9	28.0	27.9	36.3	26.1
<b>All-India</b>	<b>35.2</b>	<b>31.9</b>	<b>31.6</b>	<b>34.0</b>	<b>27.1</b>	<b>35.2</b>	<b>31.9</b>	<b>31.6</b>	<b>34.0</b>	<b>27.1</b>
<b>URBAN</b>										
Andhra Pradesh	36.3	34.6	34.2	33.6	26.6	42.8	35.4	35.0	32.8	25.9
Assam	10.2	4.7	4.6	10.5	7.5	24.6	18.4	18.9	22.7	22.8
Bihar	46.8	29.4	28.8	33.1	32.9	55.6	44.3	43.6	48.6	47.3
Gujarat	29.8	23.6	23.7	19.6	15.6	24.5	20.0	20.2	16.8	12.8
Haryana	13.7	10.0	10.0	15.7	10.0	21.2	16.1	17.0	19.6	12.6
Karnataka	43.4	36.0	36.0	31.8	25.3	38.8	31.6	31.0	24.5	18.3
Kerala	35.4	22.0	21.5	27.7	20.3	34.8	22.4	21.8	24.6	17.6
Madhya Pradesh	43.3	44.1	43.4	45.6	38.4	35.3	32.3	32.5	41.1	33.8
Maharashtra	36.3	30.5	30.2	33.0	26.8	27.3	20.7	20.5	22.4	17.6
Orissa	38.1	38.1	38.5	48.7	42.8	36.6	34.6	35.1	45.2	39.5
Punjab	10.4	7.9	7.6	9.6	5.8	16.3	12.5	12.3	16.6	12.7
Rajasthan	33.8	25.0	25.0	27.9	19.9	32.7	25.1	25.0	25.2	17.8
Tamilnadu	37.7	36.0	36.0	22.2	22.1	35.7	31.3	31.6	19.0	19.4
Uttar Pradesh	41.6	30.8	30.6	36.4	30.9	45.7	37.1	37.2	43.6	37.3
West Bengal	30.4	18.4	18.2	17.9	14.9	36.8	27.8	27.8	24.5	21.6
<b>All-India</b>	<b>34.9</b>	<b>28.0</b>	<b>27.9</b>	<b>28.9</b>	<b>23.6</b>	<b>34.9</b>	<b>28.0</b>	<b>27.9</b>	<b>28.9</b>	<b>23.6</b>
<b>MEMO: Number of Poor (million)</b>										
<b>All-India</b>	<b>278</b>	<b>276</b>	<b>274</b>	<b>327</b>	<b>262</b>	<b>278</b>	<b>276</b>	<b>274</b>	<b>327</b>	<b>262</b>
<b>15 Major States</b>	<b>274</b>	<b>269</b>	<b>267</b>	<b>319</b>	<b>257</b>	<b>272</b>	<b>271</b>	<b>268</b>	<b>319</b>	<b>259</b>

**Note:** Columns 2 and 7 are from 43rd<sup>h</sup> round unit level data, i.e. Tables 1a and 1b; columns 4 and 9 are from 50<sup>th</sup> round unit level data, i.e. Tables 2a and 2b; columns 3 and 8 are also from 50<sup>th</sup> round unit level data but MRP-A is the

MRP corresponding to the 43<sup>rd</sup> round, i.e. 365 day estimates are used only for clothing, footwear and durable goods; column 6 gives the official counts from the 55<sup>th</sup> round and column 11 reworks this applying the national poverty line uniformly to the grouped data of every state; columns 5 and 10 are obtained by applying the same poverty lines as in columns 6 and 11 to grouped data from the consumption schedule of the 55<sup>th</sup> round Employment-Unemployment Survey. The All-India number of poor is obtained applying the All-India poverty ratios to All-India population. For the 15 major States, the number of poor in each state is obtained by applying the state poverty ratio to state population.

The nature of the problem created by 7-day queries for food etc. in the 55<sup>th</sup> round CES is illustrated in Table 4 which compares poverty headcounts from the 43<sup>rd</sup> and 50<sup>th</sup> round MRPs with two sets of 30/365 day counts from the 55<sup>th</sup> round. The first are from the 55<sup>th</sup> round Employment-Unemployment Survey (EUS) which although free from 7 day problems may overestimate poverty because of an abridged consumption schedule. The second are the official 55<sup>th</sup> round counts that, although from the full CES schedule, may underestimate poverty because of its 7-day questions on food etc. It is evident from this table that despite the comparability provided by 50<sup>th</sup> round MRP on low frequency items, even the direction of poverty change is contestable. With the number of poor in India up by over 50 million between 1993-94 and 1999-00 according to its EUS but down by 12 million according to its CES, objective comparisons from the 55<sup>th</sup> round are inconclusive.

More importantly, a third objective comparison, of poverty counts using 7 day recall for food and intoxicants from 55<sup>th</sup> round CES with counts from schedule type 2 of rounds 51 to 53 which used exactly the same reference periods, also shows increase in the proportion of poor – by a magnitude even larger than obtained above by comparing 55<sup>th</sup> round EUS to 50<sup>th</sup> round MRP (see Sen 2000, 2001). This was consequence of “contamination” that occurred because the 55<sup>th</sup> round CES asked both 7 and 30 day questions on food and intoxicants to all respondents. This caused the 7 and 30day reports to converge, either because 7-day questions influenced 30day answers or the other way round or, as is most likely, by some combination of both. Although estimates of food expenditure by these two recalls did differ in the 55<sup>th</sup> round CES, this was by only 6 per cent as against 30 per cent in experimental rounds 51 to 54 where these questions had been put to different samples. Comparable poverty counts using the 7day reports in 55<sup>th</sup> round CES are overestimates to the extent that presence of 30day questions pulled down 7day reports. But, similarly, comparable 30day counts from the CES are underestimates to the extent that 7day questions pulled up 30day reports. The real issue, since official estimates use 30day reports and field instructions in 55<sup>th</sup> round CES were also to ask the 30 days question first, is by how much were 30 days answers affected, i.e. what would these have been without the 7day questions?

On this, the only direct objective check is the 55<sup>th</sup> round EUS. But, unfortunately, no independent analysis of this is possible since no details, apart from distributions of total per capita consumption by expenditure class, have been published. Moreover, the official NSSO Compact Disk containing 55<sup>th</sup> round EUS unit level data does not include its consumption schedule. This is a serious drawback since EUS estimates can mislead unless account is taken of its commodity composition. For, example, not having access to this, Sen (2001) had assumed that the 10 per cent shortfall of EUS total expenditure from CES could be attributed entirely to food and intoxicants. Since this implied a difference of 25 per cent between 7 day CES and 30 day EUS food estimates, i.e. the same ball park as 7/30 day differences in rounds 51 to 54 where the two recalls were used on separate samples, he had concluded that it was very likely that most of the “contamination” in CES was from 7 day questions to 30 day answers. It now turns out that this conclusion was incorrect.

Sundaram and Tendulkar (1993a), who did have access to unit level EUS consumption data, have clarified matters. They report that not all the difference between EUS and CES was on account of food, and that EUS estimates are about 10 per cent lower for both food and non-food. They note

correctly that, since identical reference periods were used in EUS and CES for non-food items, the lower EUS estimates for these cannot be due to “contamination”. They attribute this entirely to abridgement in the EUS. Since CES is the official benchmark and no obvious reason exists for it to have overestimated consumption of non-food items, any assessment of comparability of poverty estimates from EUS and of “contamination” in the CES must take this as the starting point.

Fortunately, it is possible to purge the EUS of underestimation in non-food items that could not have been affected by “contamination”. This requires synthetic distributions in which per capita consumption of each fractile is the fractile-specific sum of food etc. from EUS and of remaining items from CES. Since full CES details are available, and Sundaram-Tendulkar have provided fractile-wise ratios of EUS to CES expenditure on food etc., these could be computed. These imply poverty counts of 31.7 and 27.9 per cent for rural and urban India, in-between the corresponding counts from EUS and CES and almost identical to the 50<sup>th</sup> round MRP. But although this does reduce the upper bound on comparable 55<sup>th</sup> round poverty, these adjusted EUS counts continue to imply that there was no reduction in poverty ratios between 1993-94 and 1999-00. Nonetheless, since these adjusted EUS counts are similar to those from 50<sup>th</sup> round MRP, there is the positive implication that comparable poverty ratios must have reduced if any part of CES-EUS difference in estimates of food etc. was due to abridgement in EUS rather than to “contamination” in CES.

On this remaining issue of CES-EUS differences in estimates of food and intoxicants expenditure only, Sundaram and Tendulkar take the view that this was due entirely to abridgement in EUS and not at all to “contamination” in CES. But they employ a curious logic. In a vast majority of cases they find 30-day CES estimates to be higher than corresponding EUS estimates but by less than the difference that was found between 7 and 30 days estimates in experimental rounds 51 to 54. From this, i.e. absence of *full* “contamination”, they conclude *no* “contamination”. For some items, e.g. “other food”, they do find CES-EUS differences consistent with full “contamination”. But even for these they deny *any* “contamination”, arguing that the abridgement effect in EUS is likely to have been larger for heterogeneous items. They assume basically that only two outcomes are possible, either full “contamination” or none, and that this must be similar across all item groups. Since full “contamination” is not found for most food items, they cite the evidence that abridgement in EUS did measure lower non-food consumption to argue that this rules out not only full “contamination” in the few food items where this was possibility but also any “contamination” for any food item.

However, contrary to S-T’s assertions on schedule abridgement and against “contamination”, past NSS evidence is that schedule abridgement does *not* reduce reported food consumption. A methodological survey in the 38<sup>th</sup> round had found no difference in reported food expenditures from a short schedule and the full, and the same result was repeated in the 52<sup>nd</sup> round<sup>6</sup>. The short schedules in the 52<sup>nd</sup> round were in fact worksheets that, although more aggregated on non-food items, used exactly the same aggregation of food items as the worksheet of 55<sup>th</sup> round EUS<sup>7</sup>. As compared to the full 30day (type 1) schedule of 52<sup>nd</sup> round, these worksheets returned about 25 percent lower reported non-food expenditure but reported identical total food expenditure<sup>8</sup>. On this

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<sup>6</sup> See “A Note on the Results of the Methodological Survey on Integrated Short-Schedule on Consumer Expenditure” *Sarvekshana* Vol XI No. 3, January 1988; and NSSO Expert Group on Non-sampling Errors: “*Preliminary Comparison of Consumption data collected through Detailed and Abridged Schedules: NSS 52<sup>nd</sup> round*” (mimeo).

<sup>7</sup> These 52<sup>nd</sup> round worksheets (schedules 25.0 and 25.2) asked only 8 questions (all using 365day recall) on broadly aggregated non-food items, as against 24 (10 using 30day recall and 14 using 365day recall) in 55<sup>th</sup> round EUS. However, both asked only 30day questions on the same 8 broadly aggregated food items although, unlike 55<sup>th</sup> round EUS, the 52<sup>nd</sup> round worksheets also recorded break-down of food items by “home-grown” and “others”.

<sup>8</sup> Ratios of worksheet to full schedule All-India consumption estimates were 1.004, 0.774 and 0.914 for food, non-food and total in rural and 1.002, 0.731 and 0.867 in urban. However, within the food group, worksheet estimates were

evidence it is not possible to concur with ST's inference that, since the EUS returned lower non-food reports than CES, its food reports must also be necessarily less than comparable.

Since the range of uncertainty regarding poverty estimates from the 55<sup>th</sup> round cannot be reduced any further with 55<sup>th</sup> round data alone, it is worth summarising where matters stand:

- (a) Comparing with 50<sup>th</sup> round MRP, poverty headcount ratios declined 4.1 and 4.5 percentage points in rural and urban India if it is assumed that the 30 day estimates of food and intoxicants in the 55<sup>th</sup> round CES were completely uncontaminated by presence of 7day questions. If so, the absolute number of poor declined by about 12 million between 1993-94 and 1999-00.
- (b) At the other extreme, if EUS estimates of food and intoxicants are assumed unaffected by schedule abridgement, comparable 55<sup>th</sup> round poverty ratios are same as from 50<sup>th</sup> round MRP. If so, the absolute number of poor *increased by 33 million* between 1993-94 and 1999-00.
- (c) This difference is due entirely to the 10 per cent higher expenditure on food and intoxicants estimated from the 30 days recall in the CES than from the same recall in the EUS.
- (d) That the CES and EUS differ so much on food estimates makes it certain that a joint hypothesis of no effect of abridgement in EUS and no "contamination" in CES can be rejected.
- (e) Full "contamination" either way, with or without effect of abridgement, can also be rejected because 7 and 30 days food estimates do differ in the CES.
- (f) Sundaram and Tendulkar claim that the entire CES-EUS difference in food expenditure was due to abridgement in EUS and there was no "contamination" from 7 to 30 day recall in CES.
- (g) However this claim is neither supported by past NSS evidence on the effect of schedule abridgement and nor is the logic employed on "contamination" entirely sound<sup>9</sup>.

In view of the above, it is not possible to accept (a) as correct comparison. On the other hand, since (b) cannot be ruled out on past NSS evidence, any acceptable bound must admit the possibility that poverty ratios did not decline between 1993-94 and 1999-00. However, since schedule abridgement is generally believed to reduce estimates despite the NSS evidence, a more reasonable conclusion would be that there was probably both some "contamination" in CES and some effect of abridgement on EUS. The issue then is of the relative extents of EUS underestimation and CES overestimation of food expenditures. This requires recourse to data external to the 55<sup>th</sup> round.

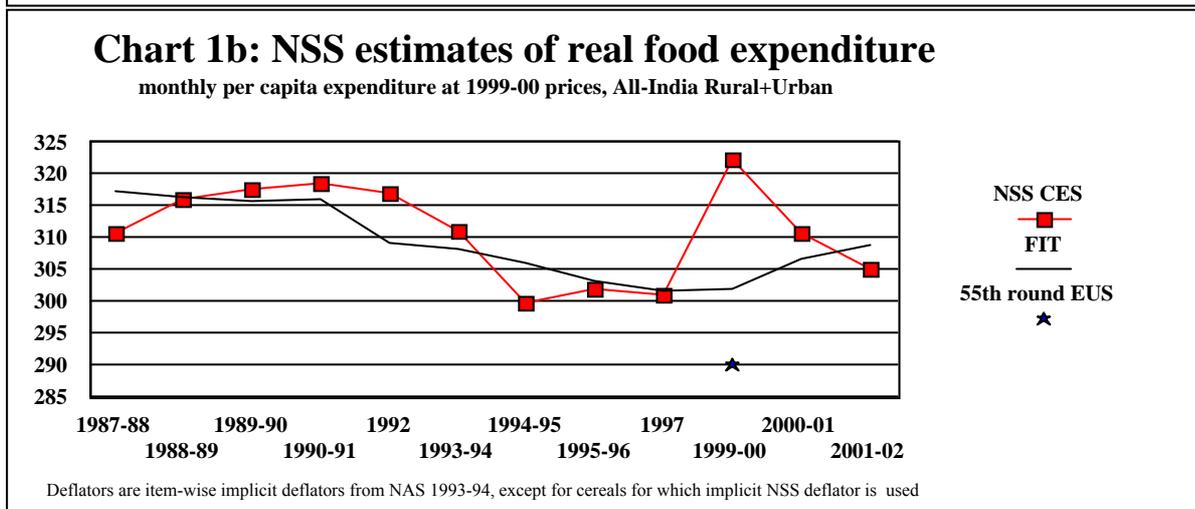
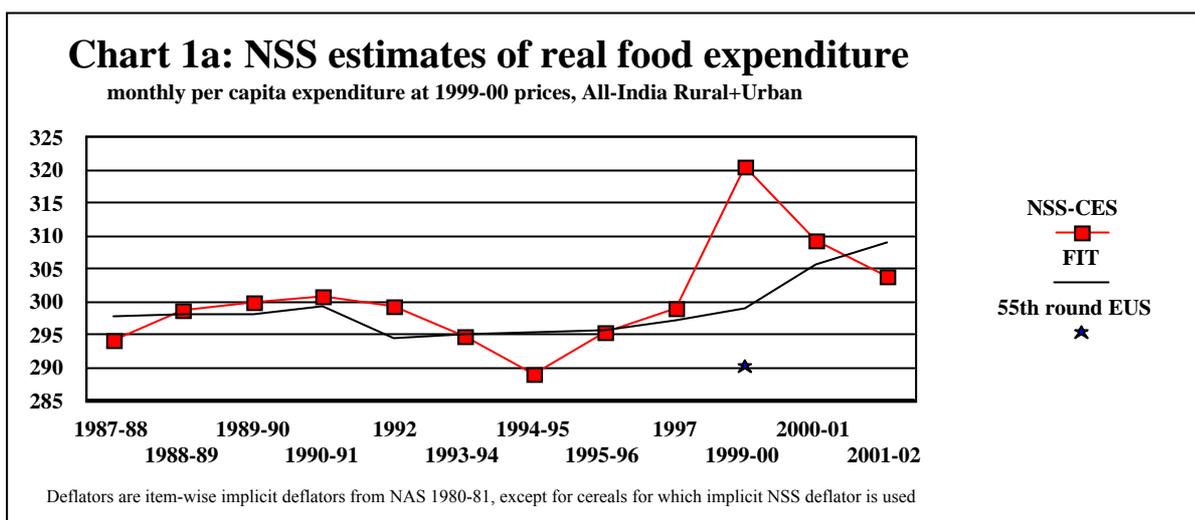
Since the purpose here is to assess 55<sup>th</sup> round comparability, not its validity, the only suitable external references are estimates from other NSS rounds. Problems of deflation do vitiate, but Charts 1 a & b, which plot real per capita food consumption from all full-year NSS rounds since 1987-88, show the 55<sup>th</sup> round CES above and EUS below all other rounds. NSS food consumption

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higher for fruits, vegetables and meat etc. and lower for other items. Interestingly, despite lower MPCE and because of their 365day recall non-food distribution, poverty counts from these worksheets were almost identical to those from the type 1 schedules of round 52. These All-India counts were about 3 percentage points larger than from 55<sup>th</sup> round EUS, reflecting almost entirely the much larger non-food underestimation in 52<sup>nd</sup> round worksheets.

<sup>9</sup> The really curious aspect of Sundaram-Tendulkar's argument is that although they report most CES-EUS differences as between full and no "contamination", they rule out the obvious. They do not even examine partial "contamination", i.e. that 7 day queries in the 55<sup>th</sup> round CES led to average outcomes somewhere in between no "contamination" and the 7-30 day difference expected from rounds 51 to 54. Their logic underlying this appears to be that each individual is likely to have given either the 30day or the 7day reply, and that the final estimate must therefore be either of these and nothing in between. But, even ignoring that this rules out arbitrarily that different individuals may have had different in-between responses for different items, there is the fact that each pairing of respondent and investigator in a random survey is an independent event. Given this, their argument that the aggregate outcome must be either the 30 or 7 day estimate, and nothing in-between, is in terms of logic dangerously close to the assertion that *since a tossed coin can only come down head or tail, in many tosses too there can only be either all heads or all tails*.

had fallen in the early 1990s when food prices increased, reversing earlier growth, but rose again when prices fell in 2000-01. A simple model, including only time trend and relative food price, shows the excess of 55<sup>th</sup> round CES over the underlying fit to be statistically significant and to account for about 70 percent of CES-EUS difference. This counterfactual would imply that poverty reduced between rounds 50 to 55, but by only 1-1.5 percentage points. However, the relative extent of CES overestimation and EUS underestimation can still be contested. Not only is there definite indication of EUS underestimation, this is nearly two-thirds the CES-EUS difference when only the nearest round, i.e. round 56, is considered reference.



**Notes:**

1. Except for cereals, constant price estimates have been obtained by deflating NSS current price estimates item-wise by the relevant private consumption deflator from the National Accounts, (base 1980-81 for Chart 2a and base 1993-94 for chart 2b) and shifting base to 1999-00. For cereals, implicit NSS deflators have been used in both cases.
2. The difference in the two series is entirely because of the larger food price inflation during 1993-94 to 1997 implicit in NAS 1993-94 compared to NAS 1980-81.
3. NSS CES are 30day estimates of food expenditure from NSS Consumer Expenditure Surveys in rounds 43 (1987-88) to 56 (2000-01). In the 55<sup>th</sup> round, respondents were asked about their food consumption by both the 30day and 7day recall and the answer to the 30day question is used above. In all other rounds, only 30day questions were canvassed on food etc from the same respondent. In rounds 51 to 53, a separate experimental schedule containing 7day food questions was administered on a separate sample. Results from these experimental schedules are not included above.
4. FIT are fitted values from the following regressions:

For Chart 2a:

$$\text{FEXP} = 5.8117 + 0.0007 * T - 0.3199 * \text{RPFD} + 0.0704 * \text{D55}; \quad R^2 = 0.827; \quad \text{DW} = 2.29$$

(0.7294)                      (2.6145)                      (4.7062)

For Chart 2b:

$$\text{FEXP} = 6.1278 - 0.0024 * T - 0.3578 * \text{RPFD} + 0.0655 * \text{D55}; \quad R^2 = 0.704; \quad \text{DW} = 1.76$$

(2.2230)                      (2.4347)                      (3.6776)

where FEXP is log of per capita food expenditure as in NSS CES above, T is time, RPFD is log of the price of food relative to non-food and D55 is a 55<sup>th</sup> round dummy. Figures in parenthesis are t-values. The plot in the chart suppresses the dummy.

In the light of this, and since an upper bound on comparable 55<sup>th</sup> round poverty has already been established, a more detailed procedure was adopted to obtain what might be a lower bound. This was based on Sundaram-Tendulkar's (1993b) finding that CES-EUS differences were concentrated on a few items, and were small for the remaining items. Since they provided item-wise, state-wise EUS details, it was possible to assess these individually against corresponding counterfactuals from neighbouring rounds, particularly the 56<sup>th</sup>. In many cases, particularly pulses, edible oil, meat etc. and vegetables, EUS estimates exceeded counterfactuals, while in other cases, particularly "other foods" and milk and products, EUS estimates were well below counterfactuals. Given this asymmetry, it was decided to conclude "contamination" in CES only if the CES estimate was higher than both the EUS and the counterfactual; and to limit its measured extent to excess of CES over the higher of these two. This procedure, i.e. only upward adjustments item-wise state-wise to EUS for its abridged schedule and no adjustment of CES to below EUS, captures Sundaram-Tendulkar's intuition and confirms their assessment of substantial EUS underestimation of items such as "other food". The results of this exercise, presented in table 5, attribute bulk of CES-EUS difference to EUS underestimation and return strikingly small estimates of CES "contamination".

The results are surprising for two reasons. First, implied extents of EUS underestimation are found to be much larger than had been found comparing estimates from 52<sup>nd</sup> round worksheets with corresponding full schedule estimates<sup>10</sup>. Second, implied extents of "contamination" from 7day food questions in the 55<sup>th</sup> round CES are almost unbelievably low. The 7-day questions in the 55<sup>th</sup> round CES questionnaire had preceded 30 day ones and instructions to ask these in reverse order were not issued till six weeks (i.e. 11.5 percent) of the survey was over. Even with full compliance, expected "contamination" of 30day reports of 55<sup>th</sup> round CES would be about this proportion of the 7-30 day differences found in experimental rounds 51-54. However, most estimates in table 5 are less than this<sup>11</sup>. This does raise questions regarding both estimates and benchmarks. But since the calculations follow S-Ts intuition, and use their tabulations that could not be checked against primary data, these small "contaminations" can safely be taken to be the *minimal* necessary correction to their unacceptable claim of no "contamination" from 7day queries<sup>12</sup>.

Table 6 presents key results on 55<sup>th</sup> round distribution and poverty, both before any adjustment and after adjusting *pro-rata* its unit level data item-wise and state-wise with the corrections for "contamination" in table 5. Although these small corrections increase 55<sup>th</sup> round All-India poverty

<sup>10</sup> Thus, for "other foods", the ratio of EUS to the implied uncontaminated CES from table 5 is 0.72 and 0.67 in rural and urban All-India while 52<sup>nd</sup> round ratios of short to full schedule estimates were 0.98 and 0.87.

<sup>11</sup> The highest implicit CES "contamination" obtained in table 5 is for "other foods", 10 and 11 percent in rural and urban All-India. These are about a fifth of the average 7-30 day difference (of 55 and 53 percent) found in rounds 51-54. In the experimental rounds, vegetables, fruits, and meat, fish and eggs also had large 7-30 day differences. For all these items, the implicit CES "contamination" is less than a tenth of the average 7-30 day difference in round 51-54.

<sup>12</sup> In particular, "contamination" is almost certainly underestimated for vegetables, fruits and for meat, fish and eggs. For these, 52<sup>nd</sup> round full schedule estimates were *lower* than from worksheets (e.g. the ratio of short to full schedule estimates for vegetables was 1.20 rural and 1.34 urban) but the calculations above do not adjust CES below EUS.

headcounts from 27.0 percent to 28.8 rural and from 23.4 to 25.1 percent urban, the “food adjusted” counts *are* lower than from 50<sup>th</sup> round mixed recall and imply reduction in poverty incidence. However, in view of all the other evidence presented and the deliberate downward bias used in computation, these must be treated as *lower* bounds to the range of comparable 55<sup>th</sup> round poverty estimates at whose upper bound All-India poverty ratios may have remained unchanged from the 50<sup>th</sup> round. Nonetheless, accepting these lower bounds conservatively for what follows, poverty reduction between 1993-94 and 1999-00 is placed finally at 2.8 percentage points. This, however, implies increase in the absolute number of poor by about 5 million and some deterioration in poverty reduction performance compared to 1987-88 to 1993-94 (Table 7).

**TABLE 5: ESTIMATED OVERESTIMATION DUE TO “CONTAMINATION” IN 30 DAY ESTIMATES OF THE 55<sup>th</sup> ROUND CONSUMER EXPENDITURE SURVEY**  
(as % of reported consumption)

	Cereals etc	Pulses etc	Milk etc	Edible Oils	Vegetables	Fruits & Nuts	Meat etc	Other food	Pan, tobacco etc.	All
<b>RURAL</b>										
Andhra Pradesh	0.00	0.00	0.00	0.00	0.40	0.00	0.00	6.30	0.00	1.03
Assam	0.00	2.17	0.00	0.00	0.00	0.00	0.00	10.22	0.00	1.18
Bihar	0.00	6.89	0.00	3.19	7.92	6.28	0.00	16.13	0.00	3.29
Gujarat	0.00	4.58	1.21	0.00	0.00	0.23	0.00	0.71	0.00	0.72
Haryana	0.26	11.19	7.15	0.00	0.00	0.00	0.00	15.29	3.20	6.07
Karnataka	0.00	6.89	9.64	0.00	12.43	11.95	0.00	5.23	0.72	4.13
Kerala	0.00	0.00	0.00	0.00	0.00	16.38	2.67	12.95	9.00	5.06
Madhya Pradesh	1.96	7.32	13.19	2.25	0.79	0.00	0.00	9.40	0.00	4.61
Maharashtra	4.24	11.77	0.00	0.00	1.28	0.00	0.00	3.44	0.00	3.08
Orissa	0.00	0.00	0.00	0.00	4.67	0.00	0.70	0.00	14.87	1.22
Punjab	2.22	9.91	0.00	0.99	0.00	10.31	0.00	16.85	13.21	5.43
Rajasthan	0.00	6.28	1.94	0.00	0.00	0.00	1.77	12.23	4.03	2.92
Tamil Nadu	0.00	11.97	0.00	0.00	2.25	12.76	0.00	17.42	0.00	5.64
Uttar Pradesh	2.82	6.80	0.96	7.06	0.00	0.00	0.00	13.80	8.68	4.52
West Bengal	0.00	0.00	2.06	2.72	7.83	0.00	7.38	0.00	4.31	2.26
All India	0.95	6.35	2.43	2.04	2.81	5.03	1.78	9.90	3.23	3.38
<b>URBAN</b>										
Andhra Pradesh	3.61	0.00	0.00	0.00	0.00	0.00	0.00	1.57	4.84	1.67
Assam	2.25	0.00	12.82	0.00	0.00	0.00	1.38	20.56	13.98	6.14
Bihar	0.00	4.31	1.49	6.89	0.00	0.00	3.57	7.27	0.10	2.21
Gujarat	0.00	6.10	2.94	3.57	0.00	14.53	0.00	11.53	0.00	4.46
Haryana	0.11	0.50	3.94	0.00	0.00	0.00	0.00	0.00	26.09	2.48
Karnataka	3.62	0.00	7.24	0.00	0.00	18.79	0.00	15.06	0.00	6.65
Kerala	2.81	0.00	0.00	0.00	0.42	11.06	0.00	0.00	0.00	1.65
Madhya Pradesh	4.40	10.55	2.73	0.00	0.00	0.00	0.50	3.69	4.00	3.32
Maharashtra	2.46	3.75	0.72	0.99	0.00	3.73	0.89	8.11	4.98	3.22
Orissa	2.82	2.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.22
Punjab	2.50	4.40	0.00	0.00	0.00	0.00	6.98	6.41	0.00	2.21
Rajasthan	2.44	3.85	10.15	1.96	0.00	0.00	9.95	11.51	8.80	6.47
Tamil Nadu	0.41	9.67	4.76	0.00	0.00	20.30	1.38	20.63	6.86	8.19
Uttar Pradesh	1.67	10.95	0.00	6.45	0.00	15.04	0.81	8.50	0.00	3.90
West Bengal	0.00	0.00	4.94	0.00	0.00	0.00	5.66	24.02	0.00	6.09
All India	1.92	5.16	2.96	1.65	0.01	9.20	2.13	11.02	3.79	4.38

**Note:** The table above reports the percentage difference between the reported CES estimate and its “uncontaminated” counterpart CES\*. The latter is estimated as

$$\text{CES}^* = \text{Min}[\text{CES}, \text{Max}(\text{EUS}, \text{Z})]$$

where CES and EUS are the relevant actual survey estimates and Z is a counterfactual. Z varies slightly from case to case but corresponds closely in all cases with interpolation to the 55<sup>th</sup> round from corresponding estimates of NSS rounds 53 and 56. EUS is derived from figures in Sundaram and Tendulkar (2003a and 2003b). All India figures are weighted averages of State-specific figures and, since no negative adjustment is being allowed at the State-level, are slightly higher than if all-India estimates of CES, EUS and Z were used.

**TABLE 6a: KEY RESULTS FROM THE 30/365 DAY RECALL OF 55<sup>th</sup> ROUND RURAL**

	MONTHLY PER CAPITA CONSUMER EXPENDITURE				GINI INDEX	POVERTY MEASURES			
	Poorest 40%	Next 40%	Richest 20%	All		National Poverty Line	State-specific Poverty Line		
						Headcount Ratio	Head-count Ratio	Poverty Gap	Squared Poverty Gap
<b>UNADJUSTED</b>									
Andhra Pradesh	292	445	794	453.47	23.8	27.5	10.5	1.8	0.5
Assam	288	438	677	425.90	20.3	27.6	40.1	8.4	2.7
Bihar	261	386	628	384.45	20.8	42.2	44.1	8.8	2.5
Gujarat	348	553	952	551.24	23.8	14.3	12.4	2.2	0.6
Haryana	436	719	1256	714.16	25.0	4.9	7.4	1.3	0.4
Karnataka	314	492	885	499.60	24.5	21.5	16.8	2.7	0.7
Kerala	437	734	1486	765.57	28.9	4.4	9.4	1.5	0.4
Madhya Pradesh	252	399	706	401.33	24.4	42.1	37.3	7.7	2.3
Maharashtra	299	490	904	496.62	26.2	25.3	23.2	4.4	1.3
Orissa	231	371	660	372.95	24.7	49.5	48.1	11.7	4.0
Punjab	456	733	1333	742.29	25.3	2.9	6.0	0.8	0.2
Rajasthan	367	554	900	548.77	21.3	10.6	13.5	2.1	0.5
Tamilnadu	298	495	984	513.75	28.4	25.3	20.0	3.8	1.1
Uttar Pradesh	291	457	836	466.44	24.9	28.5	31.1	5.8	1.6
West Bengal	296	454	769	454.24	22.6	25.9	31.7	6.5	1.9
<b>All India</b>	<b>293</b>	<b>476</b>	<b>892</b>	<b>485.87</b>	<b>26.3</b>	<b>27.0</b>	<b>27.0</b>	<b>5.3</b>	<b>1.5</b>
<b>ADJUSTED FOR 7 DAY QUESTIONS ON FOOD ETC.</b>									
Andhra Pradesh	290	442	789	450.43	23.8	28.3	11.1	1.9	0.6
Assam	286	434	671	422.27	20.3	28.4	41.3	8.7	2.8
Bihar	255	377	614	375.73	20.8	44.8	46.7	9.6	2.8
Gujarat	347	551	948	548.75	23.8	14.4	12.6	2.3	0.6
Haryana	421	693	1218	688.97	25.0	5.6	9.2	1.5	0.4
Karnataka	306	479	864	486.64	24.5	23.3	19.1	3.1	0.8
Kerala	424	711	1448	743.86	29.0	5.5	10.7	1.7	0.4
Madhya Pradesh	246	387	684	389.97	24.2	44.3	39.6	8.4	2.6
Maharashtra	292	481	893	487.82	26.4	27.2	24.9	4.8	1.4
Orissa	229	368	655	369.92	24.7	50.4	49.3	12.1	4.1
Punjab	441	712	1295	720.24	25.3	3.7	7.4	1.0	0.2
Rajasthan	361	544	884	538.68	21.3	11.6	14.3	2.3	0.6
Tamilnadu	287	477	950	495.70	28.4	28.6	23.2	4.5	1.3
Uttar Pradesh	283	444	815	453.78	25.0	31.2	34.1	6.6	1.9
West Bengal	293	447	757	447.24	22.6	27.0	33.0	6.9	2.1

<b>All India</b>	<b>287</b>	<b>466</b>	<b>873</b>	<b>475.63</b>	<b>26.3</b>	<b>28.8</b>	<b>28.8</b>	<b>5.7</b>	<b>1.7</b>
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**Source:** Unit-level data from NSS 55<sup>th</sup> Round and adjustment factors from table 5.

**Note:** The State-wise poverty lines used in columns 8 to 10 are those that were used by the Planning Commission based on the Expert Group methodology. The National poverty line implied by these is Rs 327.56 and is used in column 7. The All-India estimates in the table are those obtained by applying the national poverty line to the All-India distribution and need not correspond to the population weighted average of the State level poverty estimates. The adjustment for 7 day questions uses the state-wise, item-wise correction factors from table 5 and applies these pro-rata to the reported CES item-wise consumption of every sample household.

**TABLE 6b: KEY RESULTS FROM THE 30/365 DAY RECALL OF 55<sup>th</sup> ROUND URBAN**

	MONTHLY PER CAPITA CONSUMER EXPENDITURE				GINI INDEX	POVERTY MEASURES			
	Poorest 40%	Next 40%	Richest 20%	All		National Poverty Line	State-specific Poverty Line		
						Headcount Ratio	Head-count Ratio	Poverty Gap	Squared Poverty Gap
<b>UNADJUSTED</b>									
Andhra Pradesh	407	743	1565	773.34	31.6	26.8	27.2	5.6	1.7
Assam	425	798	1622	813.82	31.2	23.0	7.2	1.5	0.4
Bihar	318	559	1253	601.58	32.3	47.8	33.5	6.7	2.1
Gujarat	501	867	1723	891.59	29.1	11.5	14.8	2.4	0.6
Haryana	501	914	1734	911.82	29.1	13.5	10.0	2.0	0.8
Karnataka	462	880	1871	910.78	32.8	17.7	24.6	5.6	1.8
Kerala	473	900	1913	932.48	32.6	17.3	19.8	3.9	1.1
Madhya Pradesh	367	657	1419	693.36	31.9	33.7	38.5	9.5	3.3
Maharashtra	468	908	2114	973.16	35.4	17.4	26.7	6.7	2.4
Orissa	343	599	1205	618.22	29.6	39.6	43.5	11.1	3.9
Punjab	504	860	1764	898.59	29.4	11.0	5.5	0.6	0.1
Rajasthan	458	767	1531	795.70	28.5	17.2	19.4	3.4	0.9
Tamilnadu	451	845	2265	971.34	38.9	19.7	22.5	4.8	1.5
Uttar Pradesh	355	641	1459	690.07	33.2	36.6	30.7	6.6	2.0
West Bengal	433	796	1873	866.32	34.7	21.5	14.7	2.5	0.7
<b>All India</b>	<b>420</b>	<b>798</b>	<b>1836</b>	<b>854.69</b>	<b>34.7</b>	<b>23.4</b>	<b>23.4</b>	<b>5.2</b>	<b>1.6</b>
<b>ADJUSTED FOR 7 DAY QUESTIONS ON FOOD ETC.</b>									
Andhra Pradesh	402	736	1556	766.93	31.7	27.6	28.3	5.8	1.8
Assam	411	768	1565	784.70	31.2	25.9	8.6	1.7	0.5
Bihar	314	552	1237	593.72	32.3	49.0	34.4	7.1	2.2
Gujarat	489	847	1685	871.28	29.1	13.3	16.1	2.7	0.7
Haryana	494	902	1716	901.02	29.2	13.9	10.5	2.2	0.8
Karnataka	445	851	1817	881.99	33.0	20.2	27.1	6.3	2.1
Kerala	468	893	1902	924.65	32.7	18.0	20.3	4.1	1.2
Madhya Pradesh	359	645	1401	681.81	32.2	35.0	40.0	10.2	3.6
Maharashtra	459	894	2087	958.49	35.5	18.2	27.9	7.1	2.6
Orissa	339	594	1201	613.76	29.8	40.7	43.9	11.4	4.1
Punjab	498	850	1747	888.83	29.4	11.7	6.1	0.7	0.1
Rajasthan	440	739	1483	768.55	28.7	20.2	22.3	4.1	1.1
Tamilnadu	431	811	2189	933.78	39.1	22.4	24.7	5.6	1.9
Uttar Pradesh	347	627	1433	675.91	33.3	38.0	32.4	7.1	2.2
West Bengal	422	772	1800	837.53	34.3	23.9	16.0	2.9	0.8
<b>All India</b>	<b>410</b>	<b>780</b>	<b>1799</b>	<b>836.00</b>	<b>34.8</b>	<b>25.1</b>	<b>25.1</b>	<b>5.6</b>	<b>1.8</b>

**Source:** Unit-level data from NSS 55<sup>th</sup> Round and adjustment factors from table 5.

**Note:** The State-wise poverty lines used in columns 8 to 10 are those that were used by the Planning Commission based on the Expert Group methodology. The National poverty line implied by these is Rs 454.11 and is used in column 7. The All-India estimates in the table are those obtained by applying the national poverty line to the All-India distribution and need not correspond to the population weighted average of the State level poverty estimates. The adjustment for 7 day questions uses the state-wise, item-wise correction factors from table 5 and applies these pro-rata to the reported CES item-wise consumption of every sample household.

**TABLE 7: COMPARABLE MRP POVERTY CHANGES OVER ROUNDS 43 to 55**  
(based on state-specific official poverty lines)

	HEADCOUNT RATIO (%)			POVERTY GAP (%)			NUMBER OF POOR (million)		
	1987-88 to 1993-94	1993-94 to 1999-00	1987-88 to 1999-00	1987-88 to 1993-94	1993-94 to 1999-00	1987-88 to 1999-00	1987-88 to 1993-94	1993-94 to 1999-00	1987-88 to 1999-00
<b>RURAL</b>									
Andhra Pradesh	-5.0	-1.4	-6.4	-1.2	-0.3	-1.5	-1.8	-0.3	-2.1
Assam	2.1	5.3	7.4	0.2	2.4	2.6	1.2	1.9	3.1
Bihar	3.7	-6.2	-2.5	0.8	-2.2	-1.4	7.9	0.8	8.7
Gujarat	-4.8	-4.0	-8.8	-1.0	-0.6	-1.6	-0.8	-0.8	-1.6
Haryana	9.1	-13.1	-4.0	1.4	-2.5	-1.1	1.4	-1.6	-0.2
Karnataka	-9.6	-2.9	-12.5	-3.4	-1.2	-4.6	-2.3	-0.5	-2.8
Kerala	-5.8	-11.2	-17.0	-1.5	-2.7	-4.2	-1.0	-2.3	-3.3
Madhya Pradesh	-4.0	6.8	2.8	-1.3	1.4	0.1	0.0	6.0	6.0
Maharashtra	-3.7	-6.1	-9.8	-0.7	-1.8	-2.5	-0.3	-2.0	-2.3
Orissa	-10.4	3.7	-6.7	-4.3	2.1	-2.2	-1.6	2.2	0.6
Punjab	0.5	-1.1	-0.6	0.1	-0.2	-0.1	0.2	-0.1	0.1
Rajasthan	-9.1	-4.9	-14.0	-3.2	-1.1	-4.3	-1.9	-1.0	-2.9
Tamilnadu	-15.2	-4.9	-20.1	-5.3	-1.5	-6.8	-5.2	-2.1	-7.3
Uttar Pradesh	-1.3	-3.2	-4.5	-0.3	-1.5	-1.8	3.9	1.7	5.6
West Bengal	-10.3	-2.5	-12.8	-3.7	0.2	-3.5	-2.8	0.4	-2.4
15 Major States	-3.2	-2.8	-6.0	-1.4	-0.8	-2.2	-3.2	2.3	-0.9
All India	-3.3	-2.8	-6.1	-1.2	-0.9	-2.1	1.2	1.5	2.7
<b>URBAN</b>									
Andhra Pradesh	-1.7	-5.9	-7.6	-1.0	-2.1	-3.1	0.6	-0.7	-0.1
Assam	-5.5	4.0	-1.5	-0.4	1.0	0.6	-0.1	0.2	0.1
Bihar	-17.4	5.6	-11.8	-4.6	0.9	-3.7	-1.3	1.4	0.1
Gujarat	-6.2	-7.6	-13.8	-1.3	-2.1	-3.4	-0.2	-0.8	-1.0
Haryana	-3.7	0.5	-3.2	-0.7	0.2	-0.5	-0.0	0.1	0.1
Karnataka	-7.4	-8.9	-16.3	-2.7	-2.9	-5.6	-0.2	-0.7	-0.9
Kerala	-13.4	-1.2	-14.6	-3.5	-0.9	-4.4	-0.6	0.0	-0.6
Madhya Pradesh	0.8	-3.4	-2.6	-0.2	-0.6	-0.8	1.4	0.7	2.1
Maharashtra	-5.8	-2.3	-8.1	-2.4	-1.0	-3.4	0.2	1.1	1.3
Orissa	0.0	5.4	5.4	0.5	1.3	1.8	0.3	0.5	0.8
Punjab	-2.5	-1.5	-4.0	-0.3	-0.6	-0.9	-0.1	0.0	-0.1
Rajasthan	-8.8	-2.7	-11.5	-2.5	-1.0	-3.5	-0.3	0.1	-0.2
Tamilnadu	-1.7	-11.3	-13.0	-1.7	-3.0	-4.7	0.8	-1.1	-0.3
Uttar Pradesh	-10.8	1.8	-9.0	-3.2	-0.2	-3.4	-1.1	2.3	1.2
West Bengal	-12.0	-2.2	-14.2	-2.9	-0.6	-3.5	-1.6	-0.1	-1.7
15 Major States	-6.0	-3.2	-9.2	-2.1	-1.0	-3.2	-2.2	3.1	0.9
All India	-6.9	-2.8	-9.7	-2.1	-0.9	-3.0	-2.9	3.7	0.8

**Note:** Changes from 1987-88 to 1993-94 are based on 365 day recall for clothing, footwear and durable goods for both rounds 43 to 50. Changes from 1993-94 to 1999-00 are based on 365 day recall for clothing, footwear, durable goods, education and institutional health in both rounds 50 and 55. Estimates for 55<sup>th</sup> round are food adjusted as in

tables 6 a and b. Figures for “15 major states” are on basis of state-level poverty estimates and Census population of states. Figures under All-India are based on estimates using the NSS All-India distribution and All-India poverty lines.

## II. THE DEATON ADJUSTMENT

Results of the previous section have pared down reduction in headcount poverty between rounds 50 and 55 from over 8 percentage points originally claimed by Sundaram-Tendulkar to at most 3. However, this opens up a difference with Deaton’s (2003a) claim that the poverty ratio declined 7 percentage points, implying reduction in the number of poor by at least 30 million. Unlike S-T’s direct objective comparison on the 30/365 day issue, and their subjective view on presence of 7 day questions, Deaton had attempted to deal with both of these simultaneously but indirectly. He exploited the fact that, despite serious non-comparability of recall, both the 50<sup>th</sup> and 55<sup>th</sup> rounds used only 30 day questions for non-food items other than clothing, footwear, durable goods, education and institutional medical care. He pointed out that reported expenditure on this set of items are fully comparable across rounds since there was no change in reference periods and, more importantly, that poverty counts comparable with the 50<sup>th</sup> round can be obtained for the 55<sup>th</sup> round using its data for only this comparable set of goods and services, provided two assumptions hold:

- (i) that the personal distribution of expenditure on this set of goods and services is unaffected by changes in reference periods used for other goods and services; and
- (ii) that conditional probabilities of being poor, given the reported expenditure on the set of comparable goods and services, are identical in both rounds.

If these assumptions do hold, it is quite straightforward to obtain comparable poverty estimates. First, rank unit-level data from the 50<sup>th</sup> round by per capita expenditure on the set of comparable goods and services (say,  $m$ ) and group them into suitable intervals. Second, for each interval of  $m$ , calculate the proportion of individuals whose *total* consumer expenditure is less than the poverty line. Since both 30 and 365 day recall were used for clothing etc. in the 50<sup>th</sup> round, there are two sets of interval-specific poverty counts, say  $P_{3030}^{50}(m)$  and  $P_{30365}^{50}(m)$ . These are 50<sup>th</sup> round probabilities of being poor by each recall, conditional on being within a particular interval of  $m$ . Third, group the unit-level data from the 55<sup>th</sup> round into the same intervals of  $m$  after suitable deflation for price change, and obtain the 55<sup>th</sup> round proportion of total population falling in each interval, say  $N^{55}(m)$ . Now by assumption (i), the distribution  $N^{55}(m)$  is unaffected by changes in reference periods and, by assumption (ii), each  $P_i^{50}(m)$  is also the poverty count in the 55<sup>th</sup> round for that interval of  $m$  by that recall as used in the 50<sup>th</sup> round. Hence, the sum of  $N^{55}(m)P_i^{50}(m)$  over all intervals of  $m$  gives the comparable population headcount ratio for the 55<sup>th</sup> round, without requiring details about expenditure on items not in  $m$ .

Deaton obtained “adjusted” headcount poverty from the 55<sup>th</sup> round using a refinement of the above (by smoothing intervals and using kernel densities, see also Tarozzi 2002). For this he used only the uniform 30 day recall in the 50<sup>th</sup> round, i.e. only the conditional probabilities  $P_{3030}^{50}(m)$ , and thus his “adjusted” 55<sup>th</sup> round estimates are also by this uniform recall. He reports these as 30.2 and 24.7 per cent for rural and urban India using official poverty lines, as against official 55<sup>th</sup> round poverty counts of 27.1 and 23.4 per cent respectively.

The logic of the exercise is as follows. Let  $P_{3030}^{55}(m)$  and  $P_{30365}^{55}(m)$  be interval-specific poverty counts which would have been reported had the 55<sup>th</sup> round used exactly the same recalls as used in the 50<sup>th</sup>. These are unobservable, and different interval-specific counts, say  $Q_{30365}^{55}(m)$ , are

obtained from the 30/365 day reports of the 55<sup>th</sup> round. Deaton accepts the prior that  $Q_{30365}^{55}(m)$ s are less than corresponding  $P_{3030}^{55}(m)$ s and that the official 55<sup>th</sup> round poverty headcount, i.e.  $\sum_m N^{55}(m)Q_{30365}^{55}(m)$ , is an underestimate. The  $Q_{30365}^{55}(m)$ s are then replaced with  $P_{3030}^{50}(m)$ s to derive “adjusted” poverty counts. These *are* found higher than the official counts. But the claim that these are “comparable” to 50<sup>th</sup> round is entirely assumption (ii), i.e.  $P_{3030}^{55}(m) = P_{3030}^{50}(m)$ , which cannot be tested.

This is a method which is both elegant and relatively simple to implement, and addresses quite generally the problem of comparing the distribution of a variable across differently designed surveys provided that this has a stable relationship with some other variable which is not affected by the difference in survey design. However, like any surrogate procedure, this works only up to the tolerance of its assumptions. Deaton was unable to provide any test of the assumptions and relied on some validation exercises by Tarozzi (2002) with data from the experimental rounds 51 to 54. He assumed that the validity extended to the 55<sup>th</sup> round but was careful to point out that this made the results tentative. However, a simple test is possible directly with 55<sup>th</sup> round data, using no more than the logic of the adjustment. Unfortunately, the method fails the test.

To see the nature of the test, note that it is agreed that presence of 7 day questions on food and intoxicants in the 55<sup>th</sup> round led if, anything, to higher reported consumption and lower poverty estimates by 30 day recall than would be obtained if these questions were not present<sup>13</sup>. In other words, the accepted prior is that actual 30day poverty counts from 55<sup>th</sup> round data are lower, or at least no higher, than if 7 day questions for food had been absent and 30/365 day questions for other items been similar in the 55<sup>th</sup> round to those in the 50<sup>th</sup> round, i.e.  $Q_{30365}^{55}(m) \leq P_{30365}^{55}(m)$ . This is especially so since it has already been shown that presence (as in round 50) or absence (as in round 55) of the 30-day question for clothing etc. is unlikely to have affected the 30/365day poverty counts significantly. Note, also, that if assumption (ii) is correct, this applies not only to poverty counts by the uniform 30 day recall but also for counts by the mixed 30/365 day recall, i.e.  $P_{30365}^{55}(m) = P_{30365}^{50}(m)$ . It then follows trivially that a necessary condition for both the prior and the assumption to be correct is  $Q_{30365}^{55}(m) \leq P_{30365}^{50}(m)$ , which is testable.

Thus, a test of assumption (ii) is that adjusted 55<sup>th</sup> round poverty counts from this method must be higher (or at least no less) than official counts not only on implementation with 50<sup>th</sup> round poverty counts by the uniform recall which Deaton used, but also the mixed recall. Unless this is so, either the presence of 7 day questions in the 55<sup>th</sup> round increased measured poverty, which is *a priori* unlikely, or assumption (ii) is invalid.

Table 8 summarises the Deaton method. Poverty counts using official poverty lines from the 55<sup>th</sup> and from uniform and mixed recalls of the 50<sup>th</sup> round are juxtaposed against each other for various levels of real per capita spending on comparable 30 day items. It may be observed that almost all 55<sup>th</sup> round grid-specific counts are less than corresponding counts from the 50<sup>th</sup> round uniform recall but *more* than from the mixed recall. When implemented using 50<sup>th</sup> round mixed recall

<sup>13</sup> Thus, on the inclusion of 7 day food questions in the 55<sup>th</sup> round, Deaton (2001) wrote: “The simultaneous canvassing of both Schedules in the 55<sup>th</sup> round affected the amounts of expenditure reported, on at least one and more likely both Schedules. One plausible story (though it is only a story) is that when respondents were asked to report expenditures over both the last 7 and 30 days, they were in effect prompted to reconcile the two estimates of the rate of expenditure flow, bringing the two estimates closer together than would have been the case without the prompt. If the 30-day responses are shaded up by the reconciliation, and if the 7-day responses are shaded down to the same end, the new estimates would be too low on the 7-day count and too high on the 30-day count. Of course, there are other possibilities; for example, the prompting may lead to more expenditures being remembered, in which case both estimates would be higher relative to what would have been obtained with either Schedule 1 or Schedule 2 alone.”

counts, the “adjusted” 55<sup>th</sup> round poverty estimates are 25.0 and 20.7 per cent for rural and urban India. Being 4-6 percentage points less than “adjusted” counts by the uniform recall, these confirm the difference found earlier in poverty estimates by these two recalls. But since these are *less* than unadjusted estimates by 30/365 day recall, the method itself is put in doubt.

**TABLE 8: THE DEATON ADJUSTMENT USING BOTH UNIFORM 30 DAY AND MIXED 30/365 DAYS REFERENCE PERIODS**

Range of real per capita consumption on 30 day items (m) 1993-94 Rs	Distribution of persons		Poverty Counts		
	50 <sup>th</sup> Round	55 <sup>th</sup> Round	50 <sup>th</sup> Round		55 <sup>th</sup> Round
	N <sup>50</sup> (m)	N <sup>55</sup> (m)	Uniform recall P <sub>3030</sub> <sup>50</sup> (m)	Mixed Recall P <sub>30365</sub> <sup>50</sup> (m)	Mixed Recall Q <sub>30365</sub> <sup>50</sup> (m)
<b>RURAL</b>					
0-20	6.28	4.49	93.14	92.20	91.47
20-25	6.73	4.57	84.32	80.26	81.50
25-30	8.51	5.92	73.83	66.77	72.50
30-35	9.25	6.88	63.34	54.27	59.89
35-40	8.34	7.71	52.19	41.65	44.64
40-45	7.69	7.13	41.13	28.75	35.57
45-50	6.99	7.15	31.28	22.98	26.19
50-55	6.22	6.32	21.47	14.17	18.37
55-65	9.67	10.59	15.71	9.95	10.66
65-75	7.20	8.13	8.18	4.52	4.64
75-100	10.46	12.66	3.51	1.85	1.52
100-150	7.82	10.51	0.69	0.21	0.15
>150	4.84	7.93	0.02	0.01	0.00
<b>Avg N<sup>50</sup> weighted</b>			<b>37.23</b>	<b>31.56</b>	
<b>Avg N<sup>55</sup> weighted</b>			<b>30.17</b>	<b>24.98</b>	<b>26.98</b>
<b>URBAN</b>					
0-40	11.67	7.97	92.85	91.46	91.85
40-45	4.18	2.95	81.69	76.70	83.10
45-50	4.33	3.19	76.55	67.43	76.91
50-55	4.43	3.25	69.50	60.75	67.40
55-60	4.05	3.12	61.01	47.28	60.48
60-65	4.09	3.10	54.34	41.27	50.85
65-70	3.86	3.04	42.72	29.57	43.79
70-75	3.57	3.06	39.70	29.09	33.80
75-100	15.24	13.68	21.30	14.08	18.95
100-125	10.56	10.89	7.36	3.96	4.40
125-150	7.38	8.36	2.06	0.96	1.06
150-175	5.65	6.40	0.57	0.16	0.17
>175	20.98	30.98	0.02	0.01	0.00
<b>Avg N<sup>50</sup> weighted</b>			<b>32.61</b>	<b>27.92</b>	
<b>Avg N<sup>55</sup> weighted</b>			<b>24.54</b>	<b>20.67</b>	<b>23.41</b>

Source: Unit level data from NSS 50<sup>th</sup> and 55<sup>th</sup> rounds

**TABLE 9: REAL PER CAPITA CONSUMPTION OF DIFFERENT ITEMS BY RANGES OF REAL CONSUMPTION ON 30 DAY ITEMS (at 1993-94 prices)**

Range of real per capita consumption on 30 day items (m) 1993-94 Rs	50 <sup>th</sup> Round				55 <sup>th</sup> Round		
	Items with only 30 day recall	Clothing etc		Food etc	Items with only 30 day recall	Clothing etc	Food etc
		30 day recall	365 day recall	30 day recall		365 day recall	30 day recall
<b>RURAL</b>							
0-20	15.44	7.81	14.55	115.60	15.66	14.16	118.96
20-25	22.64	9.77	18.59	130.51	22.71	18.43	130.24
25-30	27.57	12.14	22.40	142.37	27.63	20.88	136.94
30-35	32.55	13.31	24.61	150.94	32.53	23.46	148.30
35-40	37.55	16.65	26.77	159.80	37.52	26.35	155.25
40-45	42.53	17.86	29.80	170.02	42.48	28.76	161.28
45-50	47.45	20.76	31.98	175.80	47.47	30.82	168.19
50-55	52.42	23.57	34.88	186.43	52.47	32.81	174.24
55-65	59.78	27.05	37.73	195.23	59.86	36.70	185.44
65-75	69.84	35.17	41.71	210.16	69.72	44.54	198.46
75-100	86.08	47.07	50.02	227.51	86.18	49.34	216.54
100-150	119.85	72.11	64.37	258.64	120.34	65.54	248.15
>150	264.12	146.01	100.21	336.65	240.77	113.93	314.34
<b>Avg N<sup>50</sup> weighted</b>	<b>62.80</b>	<b>31.87</b>	<b>37.05</b>	<b>186.74</b>			
<b>Avg N<sup>55</sup> weighted</b>	<b>74.67</b>	<b>38.80</b>	<b>41.63</b>	<b>199.21</b>	<b>72.90</b>	<b>42.36</b>	<b>190.31</b>
<b>URBAN</b>							
0-40	30.32	12.47	22.83	148.13	30.53	24.84	145.54
40-45	42.61	17.15	29.23	173.10	42.57	29.29	161.61
45-50	47.43	24.22	33.86	181.21	47.47	34.02	194.29
50-55	52.61	26.32	36.26	186.54	52.52	34.22	175.26
55-60	57.45	30.69	39.48	195.68	57.48	36.56	207.73
60-65	62.54	31.19	43.00	201.43	62.58	40.15	189.56
65-70	67.51	33.60	45.30	212.25	67.45	41.06	193.19
70-75	72.40	36.76	46.56	215.01	72.37	45.39	199.57
75-100	86.71	47.70	57.04	234.17	87.28	53.24	213.33
100-125	112.02	78.39	71.26	261.88	112.16	64.98	239.76
125-150	136.89	71.95	76.89	284.04	136.86	73.04	261.76
150-175	162.06	75.48	90.42	306.06	162.04	83.19	277.90
>175	320.12	148.23	151.56	413.68	375.27	168.32	377.86
<b>Avg N<sup>50</sup> weighted</b>	<b>131.26</b>	<b>65.75</b>	<b>72.54</b>	<b>261.09</b>			
<b>Avg N<sup>55</sup> weighted</b>	<b>159.96</b>	<b>79.04</b>	<b>85.05</b>	<b>286.21</b>	<b>177.15</b>	<b>88.01</b>	<b>264.65</b>

Source: Unit level data from NSS 50<sup>th</sup> and 55<sup>th</sup> rounds

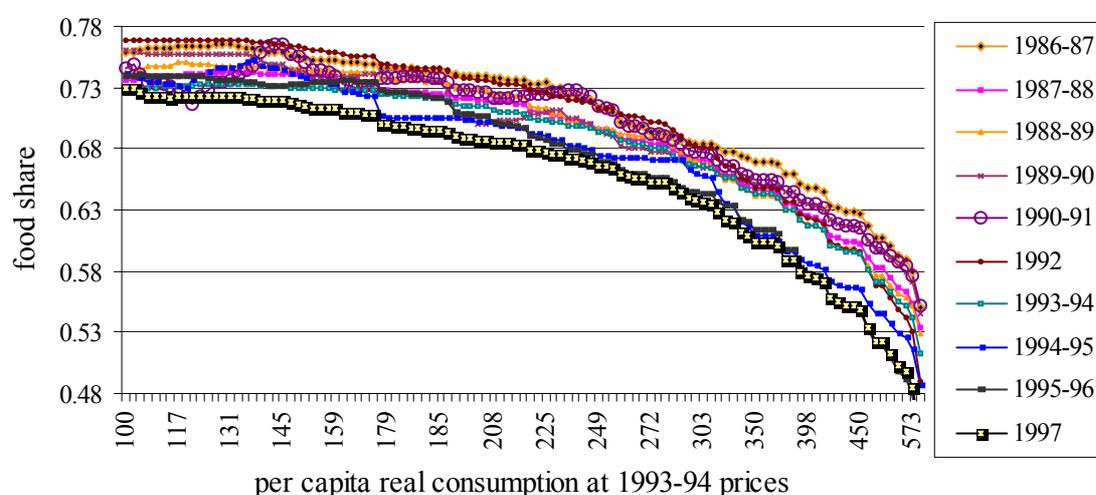
Table 9, which gives estimates of real consumption corresponding to poverty counts, indicates where the method goes awry. With 55<sup>th</sup> round distribution of clothing etc. similar to that by the 365 days recall in 50<sup>th</sup> round, and different from 30 days recall, the method adjusts quite well for this. But 55<sup>th</sup> round grid-specific poverty counts turn out higher than 50<sup>th</sup> round MRP because 55<sup>th</sup> round grid-specific food expenditures were lower than 50<sup>th</sup>. Deaton's use of 50<sup>th</sup> round surrogates thus involved *upward* "adjustment" to reported 55<sup>th</sup> round food spending, in total contradiction to the maintained prior that these were likely overestimates. It is this *contra-prior* implicit revision of food estimates, which Deaton has since acknowledged did occur, that led his "adjusted" 55<sup>th</sup> round poverty estimates to be lower than directly adjusting for 365day recall as in the previous section.

It must therefore either be accepted that presence of the 7 days queries pulled *down* 55<sup>th</sup> round estimates of food consumption or Deaton's adjustment rejected. Given the unambiguous results of experiments conducted in rounds 51 to 54 and the follow-up pilot survey conducted by the NSSO in January-June 2000 (NSSO, 2003), there is now no room for doubt that the 7 day recall does elicit much higher reported food spending. Also, although unanimity is less on "contamination", i.e. on whether or not simultaneous presence of both 7 and 30 day questions bias replies towards each other, no one has claimed the perverse outcome that presence of 7 day questions pulls down 30 day replies. The conclusion must, therefore, be that the method has failed in the present case, and led to underestimates of 55<sup>th</sup> round poverty because the required assumptions did not hold.

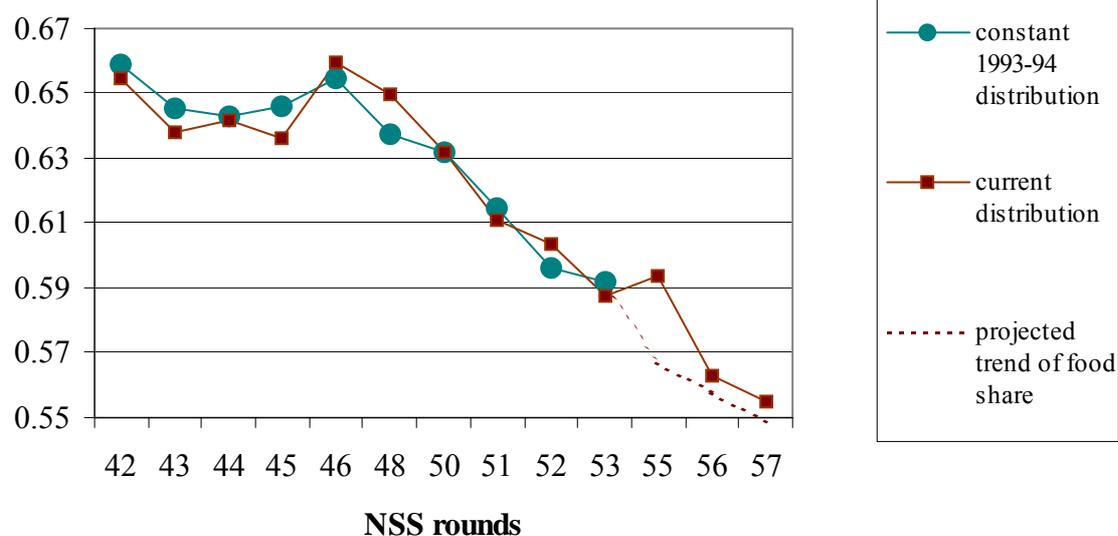
But what does assumption (ii) mean and why does it fail? Deaton has explained that this is implied if Engel curves are stable, i.e. if item shares in consumer spending are constant unless real incomes change. Now suppose this is not the case, and some people reduce food consumption to increase expenditure on fuel, rent, medicine and conveyance, keeping total expenditure constant. This could reflect changes in tastes or circumstance (i.e. relative prices, access to commons or public supply, or simply need), and the reason may matter for welfare assessment. But whatever the reason, this change should not properly affect the income poverty status of these persons if their total real expenditure remains unchanged. However, the Deaton procedure would record the increased expenditure on fuel, rent, medicines and conveyance but not the decline in food consumption. On the contrary, since it assumes unchanged shares implicitly, it would deem an increase also in food consumption and record that real expenditure increased by more than the fall in food share. Consequently some persons below the poverty line will be "adjusted" above spuriously. Since the issue is about NSS recall periods for food and of perverse outcomes on this from the Deaton adjustment, it is important to note that the method is very sensitive to stability of food shares.

In this context, a pertinent and well-known fact is that food shares, which were relatively stable during the 1980s, declined sharply in the 1990s. NSS food shares fell 10 and 13 percentage points in rural and urban India between 1990-91 and 2000-01, and the NAS trend is similar. By the underlying trend, food shares in 1999-00 were nearly 7 percentage points lower than in 1993-94, although, as would be expected from "contamination", the 55<sup>th</sup> round food shares were about 3 percentage points above trend. More important, and directly relevant to Deaton, is that most of this decline in NSS food shares was result of *shifts* of the Engel curve rather than of movements along this. This is evident from Charts 2 (a) and (b), and from the finding by Ravi (2000) that decline in food shares, particularly of cereals, is explained not by movements along fixed consumption functions but by time trends within fixed expenditure classes. Further, unadjusted 55<sup>th</sup> round data for rural India show both 10 percentage points decline in income poverty and 3 percentage points increase in nutrition poverty, implying that the Engel shift was strong in the vicinity of the poverty line. The failure of assumption (ii) is not just in-procedure; there is strong corroborative external evidence that Engel shifts did occur from food to non-food.

### Chart 2a: Engel Curves -All-India Rural



### Chart 2b: Average Food Shares All-india Rural



**Note:** Chart 2a plots food shares at current prices (using the 30 day uniform reference period) against per capita consumption at constant 1993-94 prices for all full year NSS rounds from 1986-87 to 1997. This is from grouped data of different rounds, interpolated to a common grid of real per capita expenditure.

Chart 2b plots the average food share from the above NSS rounds, both as actually reported in a round and also applying the constant 1993-94 distribution of MPCE expenditure to the expenditure class specific food shares from the different rounds. The data till round 53 pertains to the uniform 30day recall. The constant distribution shares have not been plotted for rounds 54 to 57 because only the mixed 30/365 day recall is available, and the distribution by the two recalls are not comparable. The current distribution shares are by URP till round 53 and by MRP for rounds 55 to 57.

In view of the above, Deaton's claim that poverty declined by 7 percentage points between rounds 50 and 55 is falsified. The method fails the test above in urban areas of all 15 major States and in rural areas of all but four. But, application of the method confirms 4 to 6 percentage point spurious poverty reduction as result of the 365-day question. Also, evidence in chart 2b of higher than trend food share in the 55<sup>th</sup> round confirms indirectly that there was "contamination" from 7day questions to 30day answers. Moreover, identification of downward drift in the relationship of food consumption to real income as reason for failure of the method is of wider relevance. This means increased non-food expenditure at the cost of food consumption among at least some of the poor. Besides growing divergence between nutrition and income poverty, this implies that surveys such as NCAER's Market Information Survey of Households (MISH), which ignore food consumption altogether, are likely to have overestimated the 1990s decline in income poverty<sup>14</sup>.

Furthermore, a check is possible on the results obtained in the previous section using a modification of Deaton's adjustment. Since presence of 7-day questions could not have pulled down reported food consumption, the inference should at most be that this did not bias 55<sup>th</sup> round reports for some food items. But, if so, these items are similar to those for which only 30 day questions were asked in both rounds, and grids and probabilities derived from the 50<sup>th</sup> round for application to the 55<sup>th</sup> can be suitably modified. Thus, a suggested modification to Deaton is to treat as unaffected by schedule change not only those items for which the schedule did not actually change but also food items for which implementation of the method gives a *contra-prior* outcome. Iterative expansion of the item set treated as unaffected by schedule change would either lead to accepting that all food items were unaffected, i.e. 55<sup>th</sup> round results are "comparable" to the 50<sup>th</sup> round MRP, or food items would be identified as being affected *per prior* along with the corresponding adjustment.

Work is still in progress on theoretical properties of such iteration and its implementation. But it can be shown, first, that "contamination" is still likely to underestimated<sup>15</sup>; and, second, that, if implemented with an expanded set of items considered unaffected by schedule change, the method agrees broadly with results of the previous section. It may be noted from Table 5 that two major food items with least evidence of "contamination" are cereals and edible oils. The shares of these items declined, leading to large *contra-prior* imputation. When Deaton's adjustment is done with these two treated as belonging to the same set as 30-day items, with grids and probabilities obtained on this basis, this passes the test above in most cases. Accepting unadjusted 55<sup>th</sup> round counts if the test fails, adjusted counts from this modification are presented in Table 10. Despite differences at State and sector levels notably for Tamilnadu, the All-India poverty count obtained is almost identical to that obtained from the direct food adjustment of the previous section.

Pending further work on modification of Deaton's method and verification of S-T's calculations from 55<sup>th</sup> round EUS, results from the earlier direct method are accepted tentatively and used further in what follows. However, it is important to note that, just as Sundaram-Tendulkar's estimates change drastically on proper calculation, Deaton's adjusted estimates are also likely to change if implemented consistently with the accepted prior. These two methods had seemingly converged on very large poverty reduction during 1993-2000. But on scrutiny and appropriate correction, absolute poverty as defined by the official poverty lines is seen to increase by both.

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<sup>14</sup> This is of significance since MISH data were important inputs in the argument that NSS increasingly underestimated consumption and overestimated poverty in the 1990s [Lal et.al. (2001) and Bery and Shukla (2003)]. In this context it may be noted that the NSS growth rate of real per capita non-food consumption was double that of total consumption during both 1987-88 to 1993-94 and 1993-94 to 1999-00.

<sup>15</sup> In particular, it is possible that iterations conclude all food items are unaffected although there is "contamination".

**TABLE 10: COMPARING THE MODIFIED DEATON WITH DIRECT ESTIMATES  
(Headcount Percentages using Official State-specific Poverty Lines)**

	55 <sup>th</sup> ROUND							
	50 <sup>th</sup> ROUND		Unadjusted 30/365	Original Deaton method		Modified Deaton Method		Direct Food Adjusted 30/365
	30/30	30/365		30/30	30/365	30/30	30/365	
<b>RURAL</b>								
Andhra Pradesh	15.9	12.5	10.5	14.9	11.3	16.8	13.4	11.1
Assam	45.1	36.0	40.1	44.1	35.8	48.2	40.2	41.3
Bihar	58.0	52.9	44.1	49.2	44.7	53.4	48.4	46.7
Gujarat	22.2	16.6	12.4	15.4	10.9	17.9	12.5	12.6
Haryana	28.3	22.3	7.4	12.7	9.0	13.4	10.1	9.2
Karnataka	30.1	22.0	16.8	25.7	18.3	27.3	19.5	19.1
Kerala	25.4	21.9	9.4	12.6	9.1	13.9	11.4	10.7
Madhya Pradesh	40.7	32.8	37.3	36.4	28.7	45.8	37.3	39.6
Maharashtra	37.9	31.0	23.2	29.2	23.1	29.7	23.2	24.9
Orissa	49.8	45.6	48.1	47.3	43.9	51.8	48.1	49.3
Punjab	11.7	8.5	6.0	5.9	3.9	7.9	6.0	7.4
Rajasthan	26.4	19.2	13.5	19.6	13.0	19.4	13.5	14.3
Tamilnadu	32.9	28.1	20.0	19.9	14.7	34.4	29.6	23.2
Uttar Pradesh	42.3	37.3	31.1	33.7	28.1	36.1	31.1	34.1
West Bengal	41.2	35.5	31.7	37.1	31.4	42.4	37.2	33.0
Wt Av 15 States	37.5	31.9	27.3	30.9	25.5	34.6	29.3	29.2
<b>URBAN</b>								
Andhra Pradesh	38.8	34.2	27.2	27.7	24.2	31.3	27.2	28.3
Assam	7.9	4.6	7.2	8.3	6.7	10.3	7.5	8.6
Bihar	34.8	28.8	33.5	33.8	27.3	39.0	33.5	34.4
Gujarat	28.3	23.7	14.8	16.0	12.5	20.0	16.2	16.1
Haryana	16.5	10.0	10.0	9.5	5.4	14.6	10.2	10.5
Karnataka	39.9	36.0	24.6	25.5	22.2	28.2	24.6	27.1
Kerala	24.3	21.5	19.8	18.7	16.0	21.9	19.8	20.3
Madhya Pradesh	48.1	43.4	38.5	37.9	33.9	42.6	38.5	40.0
Maharashtra	35.0	30.2	26.7	28.1	23.6	31.7	27.2	27.9
Orissa	40.9	38.5	43.5	41.4	39.6	46.0	43.5	43.9
Punjab	10.9	7.6	5.5	6.3	3.5	7.8	6.0	6.1
Rajasthan	31.0	25.0	19.4	22.8	16.3	24.6	19.4	22.3
Tamilnadu	39.9	36.0	22.5	24.4	20.4	31.0	27.6	24.7
Uttar Pradesh	35.1	30.6	30.7	30.4	27.3	34.9	30.7	32.4
West Bengal	22.9	18.2	14.7	19.5	14.7	19.6	15.4	16.0
Wt Av 15 States	33.7	29.2	24.6	25.7	21.7	29.4	25.4	26.1
<b>Memo: Number of Poor (millions)</b>								
15 Major States	<b>312.5</b>	<b>267.0</b>	<b>254.9</b>	<b>283.0</b>	<b>234.8</b>	<b>318.5</b>	<b>271.0</b>	<b>272.1</b>

**Source:** Computed from unit level data from rounds 50 and 55.

**Note:** In those cases where the implementation of the modified Deaton method gives an adjusted 30/365 day count less than unadjusted, the latter is accepted, and the modified 30/30 day count obtained by increasing the unadjusted 30/365 day count by the difference in adjusted 30/30 and 30/365 day counts.

## **V. POVERTY MONITORING WITH 55<sup>th</sup> ROUND: other estimates and regional patterns**

Previous sections have established that while correct calculation and consistent estimation with the methods of Sundaram-Tendulkar and Deaton do confirm decline in poverty ratios between the 50<sup>th</sup> and 55<sup>th</sup> rounds, the reduction is placed at less than 3 percentage points rather than the 7-9 percentage points claimed. This revised estimate of poverty decline is not far from Datt, Kozel, and Ravallion (2002)'s forecast from a model relating poverty to growth and inflation. Also, this agrees with results reported recently by Kijima and Lanjouw (2003) from a completely independent exercise. The latter obtain adjusted counts from the 55<sup>th</sup> round distribution of household characteristics by applying a multivariate parametric model fitted to 50<sup>th</sup> round data relating these characteristics to poverty. By this method, headcount poverty ratios declined by only 2.9 and 1.4 percentage points in rural and urban India, even less than obtained above from corrections to Sundaram-Tendulkar and Deaton. With measured decline in the all-India headcount ratio thus clustering in the 2.5-4.0 percentage points range from all these methods, much less than 10 percentage points from the official count, the evidence is now overwhelming that comparable poverty was underestimated very substantially in the 55<sup>th</sup> round. This also makes it likely that the absolute number of poor did not decline during 1993-2000.

However, given the extent of methodological change and the very diverse approaches adopted towards resolving resulting problems, it would be a miracle if full unanimity ever emerges regarding comparable results from the 55<sup>th</sup> round. In view of this, it is useful to highlight the differences that do exist by different methods, and to identify cases where there is agreement regarding poverty incidence and change. Since comparable numbers are required at State and lower levels for the 55<sup>th</sup> round to be useful for poverty monitoring and policy, the discussion in this section focuses on poverty counts at the level of States and NSS regions. But a factor that has nothing to do with the 55<sup>th</sup> round complicates comparisons. This is that different authors use different poverty lines for their estimates. Estimates presented in previous sections all used the official poverty lines. Deaton gives estimates both by these and by his preferred lines based on deflators derived from NSS implicit prices. Kijima and Lanjouw (KL) use only the Deaton poverty lines. Sundaram-Tendulkar and Datt et.al. (DKR) use different sets of lines altogether.

The 50<sup>th</sup> round weighted average headcount percentages (rural+urban) for the 15 major States by official, Deaton and DKR poverty lines were 36.5, 29.6 and 39.1 using 30 day uniform recall, and 31.2, 24.0 and 33.6 using 30/365 day mixed recall. Compared to official counts, Deaton's poverty lines measured about 60 million less poor in 1993-94, and DKR lines about 20 million more, with differences in ranking of States and urban-rural division. Corresponding unadjusted 55<sup>th</sup> round counts are 26.6, 18.5 and 27.9, which after the direct food correction of the previous section become 28.4, 20.0 and 29.6. The difference between 50<sup>th</sup> round MRP and food corrected 55<sup>th</sup> round using Deaton and DKR poverty lines are 4 percentage points against 3 percentage points using the official line. But, although this is similar, the number of poor declines by 3 and 14 million with the DKR and Deaton poverty lines, unlike increase using official lines. Being based on only minimal correction for 7-day food questions, the earlier finding of increase in the number of poor was quite robust using official lines but, not surprisingly, is sensitive to changes in poverty lines. On the other hand, no claim of decline in the number of poor is robust, since the Kijima-Lanjouw estimates imply that the number of poor rose by over 3 million even using Deaton's poverty lines. Nonetheless, it is important to emphasise differences made by alternative poverty deflators, especially because these are proportionately even larger at the regional level, and to distinguish these from results of alternative methodologies adopted to make the 55<sup>th</sup> round comparable.

**TABLE 11: ALTERNATIVE POVERTY ESTIMATES WITH DEATON LINES  
(Headcount Percentages using Deaton's State-specific Poverty Lines)**

	50 <sup>th</sup> Round		55 <sup>th</sup> Round			
	30-30	30-365	Unadjusted	Deaton Adjusted	Kijima-Lanjouw Adjusted	Food Adjusted
			30-365	30-30	30-30	30-365
<b>RURAL</b>						
Andhra Pradesh	29.2	24.5	22.3	26.2	23.6	22.9
Assam	35.4	27.7	31.6	35.5	36.8	32.6
Bihar	48.6	41.2	30.4	41.1	48.3	33.1
Gujarat	32.5	26.5	16.0	20.0	27.7	16.4
Haryana	17.0	12.0	3.4	5.7	14.2	4.6
Karnataka	37.9	29.3	20.5	30.7	31.0	22.4
Kerala	19.5	14.8	9.2	10.0	14.4	10.6
Madhya Pradesh	36.6	29.2	30.1	31.3	32.9	32.5
Maharashtra	42.9	36.8	23.5	31.9	35.5	25.2
Orissa	43.5	38.3	40.0	43.0	41.3	41.0
Punjab	6.2	4.3	2.7	2.4	6.4	2.9
Rajasthan	23.0	17.0	10.3	17.3	20.4	11.1
Tamil Nadu	38.5	33.3	27.7	24.3	31.8	30.5
Uttar Pradesh	28.6	22.7	15.7	21.5	26.2	17.6
West Bengal	25.1	20.3	21.4	21.9	26.4	22.3
Wtd Av 15 states	33.4	27.4	21.8	26.7	30.4	23.4
<b>URBAN</b>						
Andhra Pradesh	17.8	15.3	9.4	10.8	14.6	9.9
Assam	13.0	9.1	10.7	11.8	13.8	11.7
Bihar	26.7	20.1	18.0	24.7	31.1	18.9
Gujarat	14.7	10.7	4.0	6.4	11.9	4.5
Haryana	10.5	6.4	4.8	4.6	11.3	5.5
Karnataka	21.4	16.5	8.5	10.8	13.4	9.2
Kerala	13.9	12.6	8.7	9.6	10.5	9.2
Madhya Pradesh	18.5	13.6	10.7	13.9	17.8	11.9
Maharashtra	18.2	15.0	10.6	12.0	14.7	11.5
Orissa	15.2	13.2	13.3	15.6	17.9	13.4
Punjab	7.8	4.8	2.9	3.4	8.4	3.2
Rajasthan	18.3	12.9	6.1	10.8	15.7	8.0
Tamil Nadu	20.8	16.9	9.0	11.3	22.0	11.1
Uttar Pradesh	21.7	16.3	13.5	17.3	20.5	14.4
West Bengal	15.5	12.4	6.8	11.3	14.3	7.4
Wtd Av 15 states	18.4	14.3	9.6	12.4	16.8	10.6
<b>Memo: Number of Poor (millions)</b>						
<b>15 Major States</b>	<b>252.8</b>	<b>205.6</b>	<b>177.6</b>	<b>218.9</b>	<b>256.2</b>	<b>191.4</b>

Source: Unit level NSS data from rounds 50 and 55 for columns 2,3,4 and 7; Deaton and Dreze (2002) for column 5 and Kijima and Lanjouw (2003) for column 6.

State level estimates from alternative adjustments using official poverty lines have been presented already. On official comparison, i.e. of 50<sup>th</sup> round URP with unadjusted 55<sup>th</sup> round using official poverty lines, there is only one case, urban Orissa, where the headcount ratio increased. Only one other case, urban Assam, is added when 50<sup>th</sup> round URP is compared to Deaton's 55<sup>th</sup> round adjusted URP counts using official poverty lines. Five further cases - rural areas of Assam, Madhya Pradesh and Orissa and urban areas of Bihar and Uttar Pradesh – are added by Sundaram-Tendulkar's method (with correct calculation and using official poverty lines) which compares 50<sup>th</sup> round MRP with unadjusted 55<sup>th</sup> round. The food adjustment of section II adds only urban Haryana to this list but the list expands significantly with the modified Deaton adjustment of the previous section to include rural areas of Andhra Pradesh, Tamilnadu and West Bengal. Considering the number of poor, rather than headcount ratio, this is higher by unadjusted 55<sup>th</sup> round than by 50<sup>th</sup> round URP in rural areas of Madhya Pradesh and Orissa and in urban areas of Assam, Bihar, Orissa and Uttar Pradesh. Comparing 50<sup>th</sup> round MRP with the food adjusted MRP of the 55<sup>th</sup> round, the number of poor increases also in rural areas of Assam, Bihar, Uttar Pradesh and West Bengal and in urban areas of Haryana, Madhya Pradesh, Maharashtra and Rajasthan. This alters somewhat with the modified Deaton, which adds rural Andhra Pradesh and Tamilnadu but excludes rural Uttar Pradesh and urban Rajasthan from this list.

Estimates using Deaton's poverty lines are presented in table 11. There is no case where the unadjusted 55<sup>th</sup> round headcount ratio is higher than 50<sup>th</sup> round URP. With Deaton's adjustment, there are two such cases, rural Assam and urban Orissa. Applying the S-T method with Deaton's poverty lines expands this to six, with addition of urban Assam and rural Madhya Pradesh, Orissa and West Bengal, and no further cases are added with the food adjustment of section II. The adjusted URP estimates of Kijima and Lanjouw using Deaton's poverty lines shows headcount ratios increased in rural areas of Assam, Punjab and West Bengal and in urban areas of Assam, Bihar, Haryana, Orissa, Punjab and Tamilnadu. Considering the number rather than proportion of the poor using Deaton's poverty lines and comparing unadjusted 55<sup>th</sup> round to the 50<sup>th</sup> round URP, this increases only in rural Orissa. By the food adjusted MRP comparison, this expands to include rural areas of Andhra Pradesh, Assam, Madhya Pradesh and West Bengal and urban areas of Assam, Bihar, Haryana, Madhya Pradesh, Orissa and Uttar Pradesh. By the Kijima-Lanjouw method, the number of poor increases in rural areas of Assam, Bihar, Madhya Pradesh, Orissa, Punjab, Rajasthan, Uttar Pradesh and West Bengal and in urban areas of Assam, Bihar, Haryana, Madhya Pradesh, Orissa, Punjab, Rajasthan, Tamilnadu and Uttar Pradesh.

With the third set of poverty lines, used by Datt et.al and the World Bank, unadjusted 55<sup>th</sup> round headcount ratios are higher than 50<sup>th</sup> round MRP in rural and urban Assam and in rural Madhya Pradesh and Orissa. In addition, the number of poor is higher in rural areas of Andhra Pradesh and in urban areas of Bihar, Orissa and Uttar Pradesh. Food adjustment of 55<sup>th</sup> round using these lines expands the list to also cover rural areas of Bihar and West Bengal and urban areas of Haryana and Madhya Pradesh. As against this, Datt et.al's projections imply increase in headcount ratios in rural Assam and Bihar and, additionally, of number of poor in rural areas of Madhya Pradesh, Maharashtra and Uttar Pradesh and in urban areas of Assam, Haryana-Punjab, Madhya Pradesh, Maharashtra, Orissa and Uttar Pradesh. But this projection shows one of the best poverty reduction outcomes in rural West Bengal where most other adjustments show increase in the number of poor.

Poverty declines by all these alternative estimates in rural areas of Haryana, Gujarat, Karnataka and Kerala and in urban areas of Andhra Pradesh, Gujarat, Karnataka, Kerala and West Bengal. But taken together these account for a relatively small proportion of the total number of poor in the country. The 50<sup>th</sup> round URP measured 46, 38 and 49 million poor in this set of cases by the

official, Deaton and World Bank poverty lines and the numbers were 37, 30 and 41 million using MRP. Corresponding unadjusted 55<sup>th</sup> round numbers are 30, 20 and 33 million, which rise to 32,21 and 35 million by 55<sup>th</sup> round food adjusted MRP and to 40, 34 and 42 million by the URP estimates from modified Deaton, Kijima-Lanjouw, and from Datt et.al.'s projections.

It is also reasonable to conclude from the above that the comparable number of poor increased in rural areas of Assam, Madhya Pradesh and Orissa and in urban areas of Assam, Haryana, Madhya Pradesh, Orissa and Uttar Pradesh. The 50<sup>th</sup> round URP measured 67, 50 and 65 million poor in this set of cases by the official, Deaton and World Bank poverty lines and the numbers were 57, 41 and 55 million using the MRP. Corresponding 55<sup>th</sup> round numbers are 68, 46 and 64 million unadjusted, 71,48 and 67 million by the 55<sup>th</sup> round food adjusted MRP and 79, 54 and 68 million by URP estimates from modified Deaton, Kijima-Lanjouw and Datt et.al.

However, with the number of poor up by at least one adjustment/poverty line but not all, the direction of change remains unclear in rural areas of Andhra Pradesh, Bihar, Maharashtra, Punjab, Rajasthan, Tamilnadu, Uttar Pradesh and West Bengal and in urban areas of Bihar, Maharashtra, Punjab, Rajasthan and Tamilnadu, which together account for the vast majority of the poor. The 50<sup>th</sup> round URP measured 200, 165 and 220 million poor in these states/sectors by the official, Deaton and World Bank poverty lines and the numbers were 172, 135 and 192 million using MRP. Corresponding unadjusted 55<sup>th</sup> round numbers are 157, 112 and 171 million. These become 169, 122 and 182 million by the food adjusted MRP and 200, 169 and 219 million by the URP estimates from modified Deaton, Kijima-Lanjouw and Datt et.al. projections.

Luckily, the range of uncertainty reduces at the level of NSS regions<sup>16</sup>. Estimates are available at this level by both direct food-adjusted (DFA) counts using official poverty lines and Kijima-Lanjouw (KL) counts using Deaton poverty lines. It is possible to pinpoint locations of agreement within the set of State/sectors where different adjustment/poverty lines give different results. In rural Andhra Pradesh, the number of poor falls by both adjustments in Coastal Andhra and rises by both in rural inland South. In the other two regions there is rise by DFA but fall by KL. In Bihar, both agree on increase in rural and urban Central and in urban North and on decrease in rural South. In rural North, DFA shows fall but KL increase and the opposite occurs in urban South. In Maharashtra, they agree that the number of poor fell in all the rural Inland regions and in urban West and North and that this rose in rural East and urban Inland Central regions. But DFA shows fall and KL increase in urban East, and the opposite holds for remaining urban areas and for rural Coastal. In Punjab, both methods agree that the number of poor increased in North and decreased in South. In Rajasthan, there is agreement on increase in rural North-East and urban West and decline in urban North-East, rural West and both rural and urban South-East. But DFA shows decline and KL rise in South Rajasthan. In Tamilnadu, both agree on rise in both rural and urban Coastal Tamilnadu and decline almost everywhere else. The only disagreement is about urban Coastal Northern, where DFA shows fall and KL rise. In rural Uttar Pradesh, both agree on increase in numbers in East and West and decline in Himalayan and South, but in Central UP, DFA shows rise and KL fall. In rural West Bengal both show rise in Eastern and Western Plains and fall in Himalayan zone, but in the Central Plains, DFA shows fall and KL rise.

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<sup>16</sup> In this section, and elsewhere in the paper, population figures at the State level are obtained by interpolating between Population Censuses. These are not necessarily the same as those implicit in NSS, and NSSO recommends application of survey ratios to Census population. However, the population figures used at the level of NSS regions were not obtained directly from the Census but calculated by applying the implicit NSS share of a region's population in the State to the State total obtained from the Census (separately, for urban and rural areas). This was necessary to ensure that poverty estimates at the level of NSS regions sum to estimates earlier reported at the State level.

Thus, there is agreement in two-thirds of the NSS regions/sectors that fall within States/sectors where initially there was disagreement, with roughly equal division between regions where there is agreed increase and agreed decrease in the number of poor. The more important observation perhaps is that every State has some region(s) where the number of poor fell and others where this increased. Such within State regional variation is also observed where there is agreement across adjustments/poverty lines at the State/sector level.

Among States/sectors where there is agreed fall in poverty numbers, in only rural Kerala is there agreement by the two adjustments that the number of poor fell in both constituent NSS regions. In urban Andhra Pradesh, both adjustments agree that the number of poor increased in Inland North and the South West and declined in Coastal and Inland Southern Andhra. In Gujarat, both methods agree on increase in numbers in rural East and in the urban Dry areas and on decline in the remaining rural regions and in the urban Northern Plains; but DFA shows decline and KL increase in urban East and urban Saurashtra and the opposite is the case for urban Southern Plains. In rural Haryana, both adjustments agree on poverty decline in West Haryana but DFA shows decline and KL increase in the East. In Karnataka, both methods agree on increase in poverty numbers in urban Coastal and on decline in East, South and urban North. In rural North Karnataka, DFA shows increase but KL decline. Both methods agree on poverty reduction in urban South Kerala but DFA shows increase and KL decline in urban North Kerala. In urban West Bengal, the two methods agree on increase in number of poor in the Central Plains but not elsewhere. DFA shows reduction in Western Plains and increase in Himalayan and Eastern Plains while KL shows just the opposite.

Similarly, among States/sectors where there is agreed increase in the number of poor, only in urban Haryana is there agreement that this occurred in both constituent NSS regions. In Assam, there is agreement on increase in both urban and rural areas of the two plains regions but in the Hills, DFA shows increase in only rural and KL only in urban. In Madhya Pradesh, both agree on decline in urban South and on increase in all other urban regions and in rural Chattisgarh, Vindhya and Malwa. However, DFA shows increase and KL decline in rural South, Central and North MP while opposite is the case in rural South West. In Orissa, both agree on reduction in number of poor in rural Coastal and on increase in rural South, urban Coastal and urban North. But DFA shows increase and KL decline in rural and urban North Orissa. In urban Uttar Pradesh, there is agreement that the number of poor reduced in East and South and increased in West and Central, but in urban Himalayan UP, DFA shows increase in number of poor and KL decline.

Overall, out of the 58 NSS regions in the 15 major states, the number of poor increased by food-adjusted counts in rural areas of 27 and in urban areas of 34 regions. With poverty reduction less in regions with larger population, these accounted for 53 and 61 percent of total rural and urban populations in the major states. By the Kijima-Lanjouw adjustment, the number of poor increased in 22 rural and 33 urban regions, accounting for 51 and 54 percent of total rural and urban population. In 17 rural and 25 urban NSS regions, accounting for 39 and 44 percent of respective populations in the major States, both adjustments agree that the number of poor increased. The two also agree on reduction in number of poor in 26 rural and 16 urban NSS regions, accounting for 35 and 30 percent of the respective populations, and disagree on the remaining regions. It is thus very likely that regions where the number of poor increased account for no less of total population than those where this declined. Also, it is clear that such regions are spread all over, including in the Southern and Western States where poverty reduction performance was superior.

However, it should be emphasised that these results on the number of poor reflect demographic outcomes in addition to changes in poverty ratios. In fact, poverty ratios declined and population growth explains entirely the increase in numbers in more than half the NSS regions where the number of poor increased by both the direct food and Kijima-Lanjouw adjustments. In only 7 rural and 11 urban NSS regions, accounting for only 11 and 18 percent of the total respective populations of major states, do the two adjustments agree on increase in headcount ratio<sup>17</sup>. These constitute a relatively small subset of regions where headcount ratios increase with either the food adjustment (18 rural and 19 urban, accounting for 24 and 34 percent of respective populations) or the KL adjustment (13 rural and 22 urban, accounting for 29 and 32 percent of respective populations) considered individually. Consequently, large disagreements persist across different adjustment methods/poverty lines regarding actual changes in poverty ratios. In particular, there are 11 rural and 6 urban regions, accounting for 13 and 14 percent of respective populations, where headcount ratios reduce by the KL method but increase on MRP comparison using official poverty lines even without the food adjustment<sup>18</sup>. It thus appears likely that comparable poverty ratios increased in regions accounting for about quarter of total population. But definite identification of about half of these regions is precluded by problems to do with either 55<sup>th</sup> round reference periods or different deflators used to arrive at alternative poverty lines<sup>19</sup>. This limits seriously the usefulness of 55<sup>th</sup> round results for poverty monitoring. Since the headcount ratio increased in at least one region in every State by at least one method, it is difficult to generalise about characteristics of regions where poverty failed to decline.

In this context, the much better agreement found earlier across adjustments/poverty lines about regions where the number of poor increased makes this indicator a firmer basis than headcount ratios for decisions regarding where to expand poverty alleviation efforts. But this better agreement is essentially because the same population figures have been used across adjustments and picks up certain common regions with high population growth<sup>20</sup>. Moreover, even regarding the number of poor, it is difficult to identify those regions where this reduced significantly, e.g. at the rate required to achieve the Millennium Development Goals (MDG), i.e. by more than 20 percent between rounds 50 and 55. This was achieved in 21 rural and 12 urban regions that account for 27 and 21 percent of respective population by the food adjustment<sup>21</sup>; and in 12 rural and 11 urban

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<sup>17</sup> These regions are rural Inland South Andhra, urban South-West Andhra, rural Assam Western plains, urban Assam Eastern plains, urban South Bihar, urban and rural Central Bihar, rural East Gujarat, urban West Haryana, urban Coastal Karnataka, urban Chattisgarh, urban Vindhya, rural Malwa, rural South Orissa, urban North Orissa, rural North Punjab, urban West Rajasthan and urban Western Uttar Pradesh.

<sup>18</sup> These regions are rural South-West Andhra, rural Eastern Plains and Hills of Assam, urban North Kerala, rural areas of Chattisgarh, Vindhya, South and North Madhya Pradesh, rural and urban Coastal Maharashtra, rural Eastern Maharashtra, urban South Orissa, rural North Orissa, urban Himalayan and Central Uttar Pradesh, rural West Bengal Western Plains and urban West Bengal Eastern Plains.

<sup>19</sup> Besides regions listed in the two previous footnotes, poverty ratios may have increased in two other sets of regions. First, urban Assam Western Plains and urban Gujarat Southern Plains, where KL headcounts decline and MRP headcounts using official poverty lines increase with food adjustment but not without. Second, those where KL headcounts increase but food adjusted counts decline: urban Assam Hills, rural and urban North Bihar, urban East and Dry areas of Gujarat, urban East Haryana, urban and rural South-West Madhya Pradesh, urban Coastal Orissa, urban North Punjab, rural South Rajasthan, urban Coastal Northern Tamilnadu, rural Coastal Tamilnadu, rural Western Uttar Pradesh, urban South Uttar Pradesh, rural West Bengal Eastern Plains and urban West Bengal Western Plains.

<sup>20</sup> Of the 15 rural regions where population increased by more than 12 percent between rounds 50 and 55, 10 and 11 show an increase in the number of poor by the food and KL adjustment. Similarly, of the 24 urban regions where population increased by more than 20 percent, 19 each show increase in the number of poor by the two adjustments.

<sup>21</sup> These regions are rural and urban Coastal Andhra, rural and urban Gujarat Northern Plains and Saurashtra, rural Gujarat Dry Areas, rural Haryana, rural and urban South Karnataka, rural Coastal and East Karnataka, rural and urban South Kerala, rural North Kerala, urban South Madhya Pradesh, rural South-West Madhya Pradesh, urban East Maharashtra, rural West and Central Maharashtra, rural and urban South Punjab, urban South Rajasthan, rural West

regions accounting for 14 and 18 percent of respective population by the KL adjustment<sup>22</sup>. But this criterion is satisfied by both adjustments in only 8 rural and 3 urban regions accounting for less than 10 percent of population in the 15 major states<sup>23</sup>. Thus, contrary to some extravagant claims that have been made, India's poverty reduction performance during the 1990s can be said to have met the MDG target definitely in only a small set of NSS regions.

Given these infirmities regarding poverty change, it is more reliable from the point of view of poverty monitoring to identify regions that rank consistently by poverty incidence. This is possible since, although this too is far from perfect, different 55<sup>th</sup> round adjusted estimates correlate much better with each other on poverty levels than on comparable change from the 50<sup>th</sup> round<sup>24</sup>. Among the regions that the KL and food adjustments individually rank in the top half by 55<sup>th</sup> round rural headcount ratios, 25 are common and of these 23 also rank among the top half by both the 50<sup>th</sup> round URP counts using the Deaton poverty line and the 50<sup>th</sup> round MRP count using the official poverty line. The corresponding 55<sup>th</sup> round urban overlap is 21, with 16 of these regions also falling among those with highest poverty by both the 50<sup>th</sup> round counts. Similarly, there are 23 rural and 18 urban regions that rank consistently in the lower half by poverty ratios in both rounds 50 and 55 and across reference periods and poverty lines used.

The 23 NSS regions with consistent high rural poverty are Assam Western Plains, all three Bihar regions, East Gujarat, North Karnataka, Chattisgarh, Central, South-west and South Madhya Pradesh, the four regions of Maharashtra other than Coastal and Western, all three regions of Orissa, South Rajasthan, Coastal Northern Tamilnadu, Central, East and South Uttar Pradesh and Himalayan West Bengal. The rural population of these regions was 299.6 million in 1993-94 and rose 11.7 percent to 334.7 million in 1999-00, i.e. 47.1 and 47.6 percent of total rural population of the 15 major states. The 50<sup>th</sup> round numbers of poor (and poverty ratios) were 152.2 million (50.8%) and 132.1 million (44.1%) by the 30 day uniform recall (URP) using official and Deaton poverty lines, and 134.4 million (44.8%) using the 30/365 day mixed recall (MRP) and official lines. These regions' 50<sup>th</sup> round share of total rural poor in the 15 major states ranged 62-66%.

The mean per capita monthly consumption expenditure (MPCE) in these regions was Rs 237 and 244 by URP and MRP in the 50<sup>th</sup> round and the unadjusted 55<sup>th</sup> round MPCE at 1993-94 prices are Rs 256 and 254 using official and Deaton state-specific deflators. The official increase in real MPCE was about 8 percent. But the KL and food adjustments imply lower average MPCE increase (3.3 percent by both) and show MPCE decline in 7 and 11 of the 23 regions. Further, comparing the standard deviations of logarithms of household level per capita consumption from the MRP of

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and South-East Rajasthan, rural and urban South Tamilnadu, rural Inland Tamilnadu, rural and urban South Uttar Pradesh, rural Himalayan West Bengal and urban West Bengal Western Plains.

<sup>22</sup> These regions are urban areas of Coastal and Inland South Andhra Pradesh, rural Gujarat Southern Plains, rural West Haryana, rural and urban East Karnataka, urban North Karnataka, rural Coastal and South Karnataka, rural and urban South Kerala, urban South Madhya Pradesh, rural North Madhya Pradesh, rural West Maharashtra, urban and rural South-East Rajasthan, rural Coastal North and Inland Tamilnadu, rural and urban Himalayan Uttar Pradesh, urban East Uttar Pradesh, and urban areas of Himalayan and Eastern Plains of West Bengal.

<sup>23</sup> These common regions are urban Coastal Andhra Pradesh, rural West Haryana, rural Coastal, Eastern and South Karnataka, rural and urban South Kerala, urban South Madhya Pradesh, rural West Maharashtra, rural South-East Rajasthan and rural Inland Tamilnadu. It should be noted, however, that population declined in 6 of these 11 regions. Nonetheless, headcount ratios declined more than 20 percent in all of the above except urban Coastal Andhra, urban South Madhya Pradesh and rural Inland Tamilnadu. Moreover, if defined in terms of reduction in headcount ratio rather than number of poor, six other regions met the MDG target by both adjustments: rural Coastal Andhra, rural South Gujarat, urban North Gujarat, urban South Karnataka, rural South Punjab and urban South Tamilnadu.

<sup>24</sup> The correlation between KL and food adjusted headcounts is 0.73 and 0.55 across rural and urban NSS regions. However, only about half the regions are common among those the two methods rank in the top and bottom third.

the two rounds, inequality increased in 10 of these regions. However, as discussed in section II, absence of the 365-day questions on clothing etc. in the 55<sup>th</sup> round may have biased both reported consumption and reported inequality downwards without biasing MRP poverty counts.

The 55<sup>th</sup> round numbers (and proportions) of poor are 130.4 million (39.0%) by unadjusted MRP and official poverty lines, 139.3 million (41.6%) by food adjusted MRP using official poverty lines and 135.9 million (40.6%) by Kijima-Lanjouw URP using Deaton lines. The 11.8 percentage point reduction in poverty incidence obtained by comparing unadjusted 55<sup>th</sup> round with 50<sup>th</sup> round URP is clearly a gross overestimate since this is only 5.8 percentage points by the unadjusted MRP comparison. The reduction is even lower, only 3.2 and 3.5 percentage points, after food and KL adjustments. Thus, against fall of 21.8 million in number of poor by official comparison, there is increase of 4.9 and 3.8 million after these two adjustments. The number of rural poor increased in as many as 15 of these 23 regions by at least one of these adjustments, although both adjustments agree on only 7 of these<sup>25</sup>. This occurred because although measured real consumption rose and measured inequality fell in most regions, the resulting decline in adjusted poverty ratios was small relative to the high initial poverty levels and large subsequent population growth. As a result, the share of these regions in total number of rural poor in the 15 major states increased, from 66.1 to 67.9 percent and from 62.1 to 63.7 percent by the food and KL adjustments respectively.

At the other end, the 23 NSS regions where rural poverty ratios are consistently relatively low are Coastal, North and South Andhra Pradesh, Gujarat Northern Plains and Saurashtra, both regions of Haryana, Coastal and Eastern Karnataka, both regions of Kerala, North Madhya Pradesh, Coastal and Western Maharashtra, both regions of Punjab, West and North-East Rajasthan, Coastal and Inland Tamilnadu, Himalayan and Western Uttar Pradesh and the Central Plains of West Bengal. Rural population of these regions was 247.7 million in 1993-94 and rose 8 percent to 267.6 million in 1999-00, i.e. 38.9 and 38.1 percent of total rural population in major states. 50<sup>th</sup> round number of poor (and poverty ratios) in these regions was 54.6 million (22.0%) and 51.9 million (20.9%) by URP using official and Deaton poverty lines, and 43.0 million (17.4%) using MRP and official poverty lines, i.e. 22.9, 24.4 and 21.1 percent of total 50<sup>th</sup> round rural poor in the major states.

The 55<sup>th</sup> round numbers (and proportions) of poor in these richer regions were 33.8 million (12.6%) by unadjusted MRP and official poverty lines, 48.1 million (18.0%) by the Kijima-Lanjouw URP using the Deaton lines and 37.1 million (13.9%) by food adjusted MRP using official lines. The 55<sup>th</sup> round respective shares in total rural poor of the 15 major states were 17.6, 22.6 and 18.1 percent. Thus, poverty ratios declined by all comparisons and so did these regions' share of the total number of rural poor. As in the poorer set of regions above, poverty reduction is grossly overestimated by the 9.4 percentage point decline obtained on comparing unadjusted 55<sup>th</sup> round counts with 50<sup>th</sup> round URP and by the 20.8 million fall in number of poor implied by this. The decline in poverty ratio was 4.8 percentage points by the unadjusted MRP comparison, and only 3.5 and 4.0 percentage points by the food and KL adjustments. Nonetheless, unlike in the poorer regions above, the number of poor did fall in these regions - by 5.9 and 3.8 million after the two adjustments. The number of rural poor fell in 18 of these 23 regions by at least one adjustment and in 13 by both adjustments<sup>26</sup>.

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<sup>25</sup> These seven high poverty regions where there is also an agreed increase in rural poverty numbers are Assam Western Plains, Central Bihar, East Gujarat, Chattisgarh, East Maharashtra, South Orissa and Eastern Uttar Pradesh.

<sup>26</sup> These thirteen low poverty regions where there is also an agreed reduction in rural poverty numbers are Coastal Andhra Pradesh, Gujarat North Plains and Saurashtra, West Haryana, Coastal and Eastern Karnataka, both regions of Kerala, Western Maharashtra, South Punjab, Western Rajasthan, Inland Tamilnadu and Himalayan Uttar Pradesh.

The MPCE in these richer regions was Rs 329 and 332 by URP and MRP in the 50<sup>th</sup> round. The unadjusted 55<sup>th</sup> round MPCE at 1993-94 prices is Rs 361 by both official and Deaton deflators, implying 10 percent increase. Although the increase in real per capita consumption is somewhat lower, 7 and 9 percent, after food and KL adjustments, this is seen increasing in 16 and all 23 regions even after these adjustments. Thus, this set of richer regions had significantly lower rural population growth and significantly higher growth of real MPCE than the poor regions. This shows up in that there was definite reduction not only in poverty ratios but also in the number of the poor. Nonetheless, adjusted poverty reduction was less than could be expected from the adjusted increases in real MPCE if inequality had remained unchanged. Given this, it may be noted that, although the average measured inequality within these regions declined, this increased definitely in 11 of these regions and cannot be ruled out in any<sup>27</sup>.

The remaining 12 NSS regions of the 15 major states, with 14 percent of rural population, are those whose ranking by rural poverty incidence remains ambiguous given differences in poverty lines and different adjustments for 55<sup>th</sup> round non-comparability. 50<sup>th</sup> round numbers (and proportions) of poor were 32.0 million (35.8%) and 28.6 million (32.0%) by URP with official and Deaton poverty lines and 25.9 million (29.0%) by MRP using official poverty lines. The poverty ratios were thus intermediate between the corresponding ratios for the two sets of regions discussed earlier. Similarly, 50<sup>th</sup> round MPCEs, Rs 277 and 283 by URP and MRP were in-between those in the two earlier sets. Rural population in these intermediate regions increased from 89.3 to 100.3 million between 1993-94 and 1999-00, i.e. by 12.3 percent, higher than in the two earlier sets. Simultaneously, real MPCE increase, about 5 percent unadjusted and only 1 and 3 percent after food and KL adjustments, was lower than in the two earlier sets. Also, with inequality increasing definitely in 6 of these regions and possibly in another 3, this is the only set of regions where average measured rural inequality increased. Not surprisingly, therefore, the decline in poverty ratios was less than in the other two sets of regions. This was 8.4 percentage points by the flawed official comparison, 1.6 percentage points by unadjusted MRP, and 0.2 and 2.8 percentage points after food and KL adjustments. The 55<sup>th</sup> round numbers (and proportion) of the poor are 27.5 million (27.4%) unadjusted and 28.9 million (28.8%) after food adjustment, using official poverty lines; and 29.2 million (29.1%) by the KL adjusted URP using Deaton's poverty lines. Although official comparison of the unadjusted 55<sup>th</sup> round with the 50<sup>th</sup> round URP shows decline of 4.5 million in the number of poor, this becomes an increase of 1.6 million on unadjusted MRP comparison. The increase in number of rural poor is 0.6 million KL adjusted and 3 million food adjusted, higher in percentage terms than in other rural regions.

Turning to urban poverty, 16 NSS regions where this is consistently high are Coastal and South-West Andhra Pradesh, North Bihar, North Karnataka, Central, South and South-West Madhya Pradesh, North, Central and Inland East Maharashtra, South Orissa, South-East Rajasthan, South Tamilnadu and Central, East and South Uttar Pradesh. The urban population of these regions was 26.6 percent of total urban population in the 15 major states in 1993-94, i.e. 58.2 million. This increased by 9 percent to 63.7 million in 1999-00 but the share in the total fell to 24.8 percent. 50<sup>th</sup> round average urban MPCE of these regions was Rs 363 and 374 by the URP and MRP. It may be

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<sup>27</sup> Inequality, as measured by the within-region standard deviation of the logarithms of household level MPCE using MRP of the 50<sup>th</sup> and 55<sup>th</sup> rounds, increased in 11 of the 23 regions. In a further 9 regions, although inequality by this measure declined, this was by less than the extent to which 55<sup>th</sup> round MRP inequality is likely to be underestimated compared to that in the 50<sup>th</sup> round because of absence of 30 day question on clothing etc. Although Kijima-Lanjouw do not report inequality measures they do report poverty gaps in addition to poverty headcounts. The ratio of these two is an, admittedly truncated, inequality measure. This increased in 14 of these 23 regions and, in particular, in all the 3 regions where direct inequality comparison showed this to decline by more than possible 55<sup>th</sup> round underestimation.

noted that nominal MPCE in these poor urban regions averaged about 10 percent higher than in the rich rural regions. But urban prices are higher and inequality much greater in these urban areas. 50<sup>th</sup> round numbers of poor (and poverty ratios) in these regions were 28.5 million (49.0%) and 16.9 million (29.0%) with URP using official and Deaton poverty lines respectively and 25.8 million (44.3%) using MRP and the official lines.

The unadjusted 55<sup>th</sup> round urban MPCEs at 1993-94 prices were Rs 441 and 451 in these regions using official and Deaton deflators and Rs 432 and 392 after the food and KL adjustment. Even the lower adjusted figures imply 16 and 8 percent increase in real per capita consumption, while the unadjusted increase is over 20 percent. There are 2 regions where real MPCE declines by the food adjustment and 4 where this declines by the KL adjustment, but in no region does this decline by both adjustments. On the other hand inequality increased definitely in 9 of these 16 regions and possibly in another 4, and average inequality within these regions increased by at least 6 percent. The net result is that the number of poor rose in 6 of these 16 regions by both the food and KL adjustments<sup>28</sup>. Nonetheless, the overall poverty ratio fell, though by much less than what the official comparison suggests, and there was also a small decline in the number of urban poor. The 55<sup>th</sup> round numbers (and proportion) of the poor are 23.9 million (37.5%) unadjusted and 25.0 million (39.2%) after food adjustment using official poverty lines; and 16.2 million (25.5%) by the KL adjusted URP using Deaton's poverty lines. These regions' share of total urban poor in major states fell from around 41 to 38 percent between rounds 50 and 55.

At the other end, the 18 NSS regions with relatively low urban poverty are Inland North Andhra Pradesh, Assam Eastern Plains, four of five Gujarat regions excluding East Gujarat, both regions of Haryana, South Karnataka, South Kerala, Coastal Maharashtra, both regions of Punjab, West and South Rajasthan, Inland Tamilnadu, Himalayan Uttar Pradesh and West Bengal Central Plains. The 1993-94 urban population in these regions was 84.3 million or 38.8 percent of total urban population in the 15 major states. This increased sharply, by 22 percent, to 103.2 million or 40.3 percent of total urban population in 1999-00. At Rs 516 (URP) and 529 (MRP), the 50<sup>th</sup> round average urban MPCEs of these regions was 42 percent higher than in the previous set of poor urban regions and inequality was also less. Consequently, not only were poverty ratios lower, the number of urban poor was much less despite much larger urban population. 50<sup>th</sup> round poverty numbers (and ratios) were 17.9 million (21.1%) and 9.0 million (10.6%) with URP using official and Deaton poverty lines and 14.8 million (17.4%) using MRP and official lines. In the 55<sup>th</sup> round, MPCE rose to Rs 586 and 612 at 1993-94 prices using official and Deaton deflators, and was Rs 574 and 554 on food and KL adjustment. 55<sup>th</sup> round poverty numbers with official lines are 13.6 million (13.1%) and 14.9 million (14.5%) before and after food adjustment and 9.3 million (9.0%) by KL adjusted and Deaton deflated URP. Adjusted numbers of poor increased, albeit marginally, and in only 4 regions do both adjustments agree that the number of poor reduced<sup>29</sup>. However, since poverty ratios fell in 15 of these 18 regions by at least one adjustment and in 13 by both, this really reflects high population influx into these areas. Despite this, these regions' share of total urban poor in major states fell from about 23 to 22 percent.

The remaining 24 NSS regions, which do not rank consistently in either the upper or lower half by urban poverty ratios, account for 35 percent of the total urban population of the major states. This increased by 18 percent from 75.8 million in 1993-94 to 89.4 million in 1999-00. At Rs 422 (URP)

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<sup>28</sup> The relatively poor urban regions where there is an agreed increase in the number of poor are South-West Andhra Pradesh, North Bihar, Central and South-West Madhya Pradesh, Central Maharashtra, and Central Uttar Pradesh.

<sup>29</sup> The relatively rich urban regions where there is further agreed reduction in number of poor are Gujarat Northern Plains, South Karnataka, South Kerala, and Inland Tamilnadu.

and 430 (MRP), the 50<sup>th</sup> round average urban MPCEs of these regions was intermediate between the two previous sets. And this was also true of the 50<sup>th</sup> round poverty numbers (and ratios), which were 27.2 million (35.9%) and 14.3 million (18.9%) with URP using official and Deaton poverty lines and 23.2 million (30.6%) using MRP and official lines.

The unadjusted 55<sup>th</sup> round average urban MPCEs of these regions at 1993-94 prices were Rs 483 and 492 using official and Deaton deflators, and were Rs 473 and 451 after the food and KL adjustments. The increase in measured real per capita consumption is 10 and 7 percent by the two adjusted figures, about the same as in the previous set of regions with relatively low urban poverty. But, with real MPCE declining in 10 of these 24 regions on at least one adjustment, there is much greater variability regarding this. Moreover, with measured inequality increasing in 20 of 24 these regions, and by 8 percent on average, within-region urban inequalities increased much more in these urban regions than elsewhere. The 55<sup>th</sup> round poverty numbers (and ratios) are 25.7 million (28.7%) and 27.0 million (30.2%) with official lines before and after food adjustment and 17.3 million (19.3%) by the KL adjusted and Deaton deflated URP. Although the official comparison shows decline of 7.2 percentage points and 1.5 million in the poverty ratio and number, the ratio declines by only 1.5 percentage points and the number increases by 2.5 million by the unadjusted MRP comparison. After food adjustment, the change in poverty ratio becomes negligible and the increase in the number of poor becomes 3.8 million. With the KL adjustment, both the ratio and numbers increase. The number of urban poor increased in as many as 19 of these 24 regions by at least one adjustment and in 12 by both<sup>30</sup>. Although this too was in part result of high population growth, the poverty ratio increased in many cases. The proportionate increase in the number of poor in this set of regions was higher than any other, rural or urban, and the share of these mid-poverty regions in the number of urban poor in 15 major states increased from 36 to 40 percent.

These comparisons of 50<sup>th</sup> and 55<sup>th</sup> round adjusted poverty counts at the level of NSS regions overturn some conclusions that others have reached. First, contrary to a claim often made, there is no clear State-level pattern to divide NSS regions by good or bad poverty reduction performance. By each adjustment, almost every major state had at least one rural or urban region where the poverty ratio increased and also at least one region where this declined. Second, contrary to what appears from unadjusted data and has been claimed at the State level by Deaton-Dreze with their adjusted counts, there is no evidence of 'divergence' (i.e. of lower rates of poverty reduction in regions that had more poverty to start with). Correlation between 50<sup>th</sup> round poverty ratios and subsequent proportionate change is negligible across rural areas of NSS regions and of the wrong sign across urban areas of these regions<sup>31</sup>. Third, contrary to another common claim, urban poverty reduction outcomes were worse than rural in most regions. The proportionate decline (increase) in poverty ratio was smaller (larger) in urban than in rural areas of 45 of 58 NSS regions by at least one of food or KL adjustment and in 35 and 34 regions by these individually. Overall, there is little support from the adjusted counts for an assessment often made: that despite some increase in regional inequality and in urban-rural disparity, exceptions to significant and widespread poverty reduction during the 1990s were few, limited almost entirely to certain backward, mainly rural, locations in East and Central India where high national GDP growth failed to penetrate.

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<sup>30</sup> The mid-poverty urban regions where there is agreed increase in number of poor are Assam Western Plains, South and Central Bihar, Coastal Karnataka, Chattisgarh, Vindhya, Malwa and North Madhya Pradesh, Coastal and North Orissa, Coastal Tamilnadu and Western Uttar Pradesh.

<sup>31</sup> The correlations across NSS regions between 50<sup>th</sup> round MRP poverty counts using official deflators and the subsequent proportionate change to food adjusted 55<sup>th</sup> round counts are -0.09 and -0.34 for rural and urban areas. The correlations between 50<sup>th</sup> round URP poverty counts using Deaton deflators and subsequent proportionate change to KL adjusted 55<sup>th</sup> round counts are 0.03 and -0.23 in rural and urban areas.

This does not of course mean that Eastern and Central regions did not have poor poverty reduction performance. They did, but so did a number of regions elsewhere. Nor does it mean that regional inequalities did not increase. Inequality of inter-regional distribution of MPCE increased quite sharply in both rural and urban areas by all measures and irrespective of deflation or adjustment. Although changes in within-inequality meant that this was not reflected fully in changes in inter-region inequality of adjusted poverty counts, this too increased by most measures in both rural and urban areas. The reason why this does not show up as ‘divergence’ is because, as observed earlier, poverty reduction performance was worst in a whole set of ‘middle’ regions which had lower initial poverty than the poorest regions. Similarly, the evidence that urban poverty reduction was less than rural in most NSS regions certainly does not imply reduced rural-urban disparity. Adjusted NSS data not only show that growth of average urban real MPCE was more than double that of rural MPCE but also that urban MPCE grew faster than rural MPCE in 38 and 41 NSS regions by the food and KL adjustments separately, and in 36 regions by both. That urban poverty reduction was nonetheless worse in most regions is because of increased within-region urban inequality. This increase was sizeable on average and occurred in 42 of the 58 NSS regions in the major states<sup>32</sup>. In short, although poverty ratios did fall using adjusted NSS data, significant reduction was not widespread: increased inter-region and inter-sector inequality limited the spatial spread of MPCE growth and a rise in within-region inequality caused insignificant poverty reduction (or even increase) in many regions where MPCE did grow significantly.

This conclusion strengthens considerably on considering the number rather than proportion of the poor. This is of course in part a trivial consequence of population growth, but it is important to note that the demographics had a pattern, important for poverty outcomes. Population growth was highest in the richer urban regions, much higher than in the poorest urban regions, and this was lowest in the richest rural regions where it was much lower than in poorer rural regions. In addition to well-known regional variations in natural growth, this pattern almost certainly reflects incentives regarding migrant destinations and constraints on ability to migrate. The set of richest urban regions, the obvious magnet for migrants, had the highest growth of total expenditure and significant decline in the average headcount ratio. But, since population growth was high, the adjusted number of poor increased marginally. At the other end, population growth averaged below natural growth in the richest rural areas and in the poorest urban areas. Average MPCE is similar in these two sets and lower than in other urban areas, but this is higher than in other rural areas compared to which connectivity is much better. These two are the only sets that show decline in the adjusted numbers of the poor. On the other hand, population growth was almost at the natural rate in the two sets of poorer rural regions, much higher than in the richest rural regions despite lower initial MPCE and much lower subsequent MPCE growth. Not surprisingly, the largest absolute increase in the adjusted numbers of poor occurred in these already poor regions. However, the proportionate increase in adjusted numbers of poor was highest in the set of middle urban regions. Population growth was only slightly less here than in the richest urban areas and, although MPCE growth was relatively high, these are the location of largest increase in within-region inequality and lowest decline in poverty ratios. On further break-up it is found that most of the increase in the number of rural poor also occurred in the rural hinterland of these middle urban regions. With urbanisation slowing down<sup>33</sup>, adjusted NSS 55<sup>th</sup> round data indicate that the focus of

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<sup>32</sup> The inequality measure used is the within-region standard deviation of the logarithms of household level MPCE using the 30/365 mixed recall. Kijima and Lanjouw do not report any measure of inequality but that urban inequality increased sharply by their adjustment also is implicit since they report real MPCE declining in only 12 of the 58 urban regions, the headcount ratio increasing in 22 and the poverty gap increasing in 32.

<sup>33</sup> The urban share of population grew 0.8 % per annum during 1991-2001 as compared to 1.4% during 1971-1991.

poverty analysis should be as much on ability of urban regions to offer escape and linkages, and on determinants of mobility from poorer rural areas, as it must be on rural income growth.

These conclusions regarding broad regional and sectoral patterns in growth and of changes in inequality and poverty are fairly consistent across the food and Kijima-Lanjouw adjustments despite differences at the level of specific regions. Although the two adjustments approach the problems of 55<sup>th</sup> round comparability very differently, these not only agree on the overall dimension of the resulting underestimation of comparable poverty but also that this was systematically larger in relatively richer regions. In particular, the two adjustments agree on presence of pockets of poverty increase in almost every State, on absence of “divergence” in poverty incidence despite increased inequality of the inter-region distribution of MPCE, and on relatively worse poverty outcomes in urban areas of most regions despite their more rapid growth. Although Kijima-Lanjouw do not discuss inequalities explicitly, and their method is rather static on both growth and inequality, the main message from these points of agreement is that the 55<sup>th</sup> round underestimated comparable within-region inequality, and did so quite comprehensively<sup>34</sup>.

That the 55<sup>th</sup> round shift from 30-day uniform to 30/365day mixed recall caused comparable inequality to be underestimated is accepted more generally. Although unadjusted comparison of rounds 50 and 55 shows MPCE inequality declining in both rural and urban areas of most states, Deaton-Dreze report inequality rising after their adjustment in 8 rural and 12 urban areas of the 15 major States. They report unchanged rural inequality at all-India level and significant increase in MPCE inequality within urban areas, between urban and rural areas, and across States. But although they too point to pockets of impoverishment below State level, they did not go below this level, stressing “divergence” in inter-State poverty reduction instead. This is the only major difference between their results on inequality and those reported here. Since inter-region MPCE inequality did increase, poverty reduction would be expected to “diverge” if growth were strongly poverty reducing and if insufficient growth in poor regions had been the only reason for insufficient poverty reduction. On the other hand, the earlier finding of no poverty “divergence” across NSS regions suggests that growth itself may not have reduced poverty sufficiently.

In fact, most of the poverty “divergence” reported by Deaton-Dreze appears to be a spurious outcome of change in recall and of their adjustment for this. The correlations that they based this on are larger after their adjustment than with unadjusted 55<sup>th</sup> round data<sup>35</sup>. On the other hand, differences between 50<sup>th</sup> round URP and MRP counts are proportionately larger in States with lower poverty<sup>36</sup>, suggesting that spurious poverty reduction as result of 55<sup>th</sup> round shift to MRP was systematically larger in richer States. Poverty “divergence” is weak with unadjusted MRPs from the two rounds and disappears on KL’s adjustment<sup>37</sup>. The measured inter-State pattern of

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<sup>34</sup> This degree of agreement is surprising since the two actually correlate rather poorly on poverty change. KL only measure changes in household characteristics, implicitly holding constant mean MPCE and variance associated with any vector of characteristics. Consequently, they underestimate changes in both MPCE and inequality compared to the food adjusted estimates that largely accept the 55<sup>th</sup> round MPCE distribution, with the slight food correction made state/item-wise but irrespective of household characteristics. Moreover, the two use different poverty lines.

<sup>35</sup> The State-level correlations between 50<sup>th</sup> round URP counts using Deaton’s poverty lines and subsequent proportionate change to corresponding unadjusted 55<sup>th</sup> round counts are 0.53, 0.11 and 0.59 for rural, urban and rural+urban. After Deaton’s adjustment to 55<sup>th</sup> round, these correlations become 0.69, 0.34 and 0.73.

<sup>36</sup> The State-level correlations between 50<sup>th</sup> round URP counts using Deaton’s poverty lines and proportionate difference of corresponding 50<sup>th</sup> round MRP counts from these are 0.83, 0.36 and 0.78 for rural, urban and both.

<sup>37</sup> State-level correlations between 50<sup>th</sup> round MRP counts using Deaton poverty lines and subsequent proportionate change to unadjusted 55<sup>th</sup> round counts are 0.43, -0.01 and 0.49. State-level correlations between 50<sup>th</sup> round URP counts and subsequent proportionate change to Kijima-Lanjouw’s adjusted 55<sup>th</sup> round counts are -0.03, -0.12 and 0.01.

poverty reduction is thus very sensitive to surrogates used to correct the 55<sup>th</sup> round. Also, not surprisingly, Deaton’s strong State-level correlations become much weaker across NSS regions<sup>38</sup>.

Food adjusted MRP comparisons actually show conditional poverty convergence across urban areas but a positive association between growth and inequality increase as well as evidence of change in earlier patterns of how rural and urban growth spill over on to poverty reduction<sup>39</sup>. These imply much lower impact of growth on poverty reduction than Deaton-Dreze<sup>40</sup>. Further, absence of 30-day questions on low frequency items in the 55<sup>th</sup> round may have underestimated consumption relatively more in richer regions. If so, growth may have been somewhat less effective in reducing poverty than implied even by the food adjusted estimates. However, the main conclusion from this disagreement on “divergence” is that the 55<sup>th</sup> round overestimation of poverty reduction was not proportionately uniform across regions and that different adjustments “correct” differently. Consequently, although some broad regional patterns do emerge that could otherwise have aided understanding of spatial linkages following economic “reform, this round remains unreliable on how poverty changed across States and regions<sup>41</sup>.

<sup>38</sup> Deaton (1993c) has subsequently provided region level adjusted poverty counts using his poverty lines. Adjusted with his original state-level non-parametric relation between poverty and consumption of 30 day items, correlations across NSS regions between 50<sup>th</sup> round counts and subsequent percentage change to these “adjusted” 55<sup>th</sup> round counts are -0.24, -0.38 and -0.17 for rural, urban and both. These carry the wrong sign. He also presents alternative counts using regional level probits. Correlations using these are 0.22, -0.19 and 0.26. Although these do suggest some divergence in rural areas, this is much weaker than the same correlations at State-level. Interestingly, these Deaton counts correlate better with food adjusted estimates on poverty change across NSS regions than either of these do with KL’s counts. Further, almost every state has a region where the number of poor increases by these Deaton counts also.

<sup>39</sup> The following regressions across NSS regions with food adjusted MRPs using official poverty lines are instructive:

	Constant	Drmpce	Dumpce	Rpov	Upov	Drineq	Duineq	R <sup>2</sup>
<b>Drpov</b>	1.26	-2.58	-0.58	0.01	0.05	0.23	0.33	0.72
T-values		(-9.34)	(-2.04)	(0.18)	(0.93)	(1.77)	(2.03)	
<b>Drpov</b>	1.25	-2.68	-0.21	0.02	0.00			0.66
T-values		(-9.12)	(-0.79)	(0.35)	(0.09)			
<b>Dupov</b>	1.43	0.30	-2.13	0.08	-0.25	-0.24	0.69	0.62
T-values		(0.88)	(-6.02)	(1.26)	(-4.00)	(-1.50)	(3.41)	
<b>Dupov</b>	1.36	0.13	-1.62	0.10	-0.27			0.53
T-values		(0.36)	(-4.76)	(1.36)	(-4.22)			
<b>Duineq</b>	-0.09	-0.26	0.86	0.02	-0.07			0.26
T-values		(-1.10)	(3.87)	(0.51)	(-1.60)			

Here Drpov and Dupov are log changes in rural and urban poverty ratios between rounds 50 and 55, Drmpce and Dumpce are log changes in rural and urban nominal MPCE, Drineq and Duineq are log changes in within-region urban and rural inequality (log variances of nominal MPCEs), and Rpov and Upov are logs of poverty incidence in the 50<sup>th</sup> round. These show no evidence of either divergence or convergence of rural poverty and in fact show conditional convergence of urban poverty with indication that inequality increased more where urban poverty was initially lower. Growth and inequality change within each sector has the expected effect on poverty change within that sector. But importantly, rural growth has no effect on urban poverty while urban growth reduces rural poverty – a result opposite to that found in studies using earlier Indian data. Also, urban MPCE growth and inequality increase are positively correlated, and the increase in urban inequality is associated also with less rural poverty reduction. All of the above suggest tendencies to weaken the poverty reducing impact of the much higher urban MPCE growth than rural. However, the same fits with food adjusted counts but Deaton poverty lines show neither urban convergence nor cross-effect of urban growth on rural poverty. Instead, higher initial urban poverty is found to retard rural poverty reduction.

<sup>40</sup> In addition to “divergence”, urban poverty counts decline more than rural in most regions by Deaton’s adjustment. Also, unlike food or KL adjustments, this shows rural and urban poverty reduction strongly and positively correlated across NSS regions. The first of these is a matter of poverty lines but the second of adjustment. Deaton’s adjusted counts in fact show strong cross effect of urban growth and inequality on rural poverty even with his poverty lines.

<sup>41</sup> Food adjusted counts using Deaton poverty lines, show more poverty decline than either Deaton or KL adjusted in most NSS regions of Bihar, Gujarat, Maharashtra and Rajasthan. The opposite is true in Andhra Pradesh, Assam, Madhya Pradesh, Orissa, and West Bengal. This is indication of possible regional biases in food adjusted counts.

## VI. POVERTY AND INEQUALITY DURING THE 1990S

The disaggregated results from different adjustments for methodological changes in the 55<sup>th</sup> round thus reinforce the basic conclusion so far: this round underestimated comparable poverty very considerably and this underestimation was not captured fully by the adjustments offered by Deaton and by Sundaram-Tendulkar. In particular, it is certain that the number of poor did not decline by 60 million as found using unadjusted official counts or even by 30 million as implied by the Deaton-Dreze adjustment. It is most likely that the number of poor actually increased between 1993-94 and 1999-00. Some broad regional patterns also emerge, consistent with the nature of biases involved, indicating why poverty reduction was low. However, these results remain of limited use for identification of regions for policy. Differences in poverty lines and adjustment methods mean that there are large ambiguities regarding poverty incidence in some regions and that there are disagreements regarding poverty change in more regions. One aspect of this, the issue of appropriate poverty lines, is of course independent of the 55<sup>th</sup> round but remains important from the point of view of proper poverty monitoring. Other differences stem from different approaches to grapple with 55<sup>th</sup> round non-comparability, and are perhaps inevitable given the serious nature of this underlying problem.

The crucial issue raised thereby is about the significance that ought to be attached to 55<sup>th</sup> round results, since without adjustment these are completely at variance with those from the nine preceding rounds that the NSS had conducted during the 1990s. With the small adjustments of Deaton and Sundaram-Tendulkar, 55<sup>th</sup> round results have been used to attempt a reversal of the consensus that had emerged from these previous rounds – that poverty reduction had suffered a serious set-back during the 1990s. Being a quinquennial large sample round, results from the 55<sup>th</sup> round should normally have commanded greater credibility than the other, mostly “thin” sample, results. However, given its acknowledged non-comparability and the limitations discussed earlier of both Sundaram-Tendulkar and Deaton adjustment procedures, the normal credibility of a “thick” sample is missing in this case. Against this are the earlier 1990s rounds, each of which may have had individual limitations but which together constituted a set of independent samples having comparable recall, with collective size far exceeding that of the 55<sup>th</sup> round, and whose results were sufficiently consistent to have led to a consensus. In view of this, it is necessary to go beyond comparison of the 50<sup>th</sup> and 55<sup>th</sup> rounds. This is particularly so because results have now become available from NSS “thin” rounds 56 and 57 (2000-01 and 2001-02) which reverted to only 30 day recall for food while retaining only 365 day recall for clothing etc. These and adjusted 55<sup>th</sup> round results need to be compared with earlier NSS data.

Since “thin rounds” do not command general credibility below the national level, it is useful to comment first on State-level results from the 43<sup>rd</sup> round (1987-88), the last “thick” 1980s round. The official URP comparison of 43<sup>rd</sup> with 50<sup>th</sup> round had shown only 3-percentage point decline in the poverty ratio, a sharp deceleration from previous trends. The number of poor had increased 13 million nationally, and individually in rural Assam, Bihar, Haryana, Karnataka, Madhya Pradesh, Maharashtra and Uttar Pradesh and in urban Andhra Pradesh, Haryana, Madhya Pradesh, Maharashtra, Orissa and Tamilnadu. But the MRP counts in table 7 imply a larger poverty decline of 4.3 percentage points. The 50<sup>th</sup> round number of poor is now lower than 43<sup>rd</sup>, with this no longer rising in rural Karnataka or rural Maharashtra but higher in rural Punjab. With poverty change sensitive to recall even comparing surveys with similar reference periods, there is an implication that MRP counts may be declining faster than URP as consumption patterns change. Also, in some

cases, e.g. rural Haryana, the 50<sup>th</sup> round appears to be an outlier. But, overall, poverty change from rounds 43 and 50 MRP is not too dissimilar to that found comparing rounds 50 and 55 MRP.

Direct comparison of 43<sup>rd</sup> round MRP counts with the 55<sup>th</sup> is slightly more complicated since in the former 365 day questions were asked only for clothing, footwear and durables and not for education and institutional health. However, this is surmountable since the 50<sup>th</sup> round permits calculation of MRP counts with and without 365-day reports for education and institutional health, and the difference turns out to be small. Using official poverty lines and unadjusted 55<sup>th</sup> round counts, there is fall of 8 and 11 percentage points in rural and urban poverty ratios and a reduction in the number of poor by about 13 million. With food adjusted 55<sup>th</sup> round counts, the decline in poverty ratios become 6.2 and 9.8 percentage points over the twelve year period from 1987-88 to 1999-00 and the number of poor is seen to increase slightly. The pace of poverty reduction over this longer period (0.5 and 0.8 percentage points per annum in rural and urban areas) is similar to the 50<sup>th</sup> and 55<sup>th</sup> round comparison, as is the indication that this was not enough to reduce the absolute number of poor. Moreover, except that West Bengal is one of the better performing States on this longer comparison, the State-wise pattern is also similar<sup>42</sup>. Comparing food adjusted 55<sup>th</sup> round counts with 43<sup>rd</sup> round MRP, the number of poor increased in rural areas of Assam, Bihar, Madhya Pradesh, Orissa, Punjab and Uttar Pradesh and in urban areas of Assam, Bihar, Haryana, Madhya Pradesh, Maharashtra, Orissa and Uttar Pradesh. The best performance was in Gujarat, Karnataka, Kerala, Rajasthan, Tamilnadu and West Bengal, in each of which the number of poor (urban+rural) declined by more than 15 percent. At the level of NSS regions, although 55<sup>th</sup> round poverty ratio is lower than the 43<sup>rd</sup> in most regions, the number of poor increased in 29 rural and 42 urban regions spread all over the 58 NSS regions in the major States<sup>43</sup>. Further, as in the shorter comparison, this is associated with greater urban-rural disparity; and within-region urban inequality increased in as many as 40 NSS regions.

This indication that 55<sup>th</sup> round food adjusted counts are not markedly differently from the MRP trend from the two previous “thick” NSS rounds is important. It confirms that the shift to only a 365 day recall for low frequency items was the main source of the misleading results obtained by comparing the unadjusted 55<sup>th</sup> round with URP of previous rounds. It also suggests positively that simply juxtaposing may restore some inter-temporal comparability between existing URP and available MRP data with minimum further adjustment. For this, estimates by uniform 30 day recall from NSS rounds before the 55<sup>th</sup> can be plotted on separate axes against corresponding estimates using 365 day recall for clothing etc. which was the only one used in rounds 55 to 57. Besides rounds 43 and 50, for which both URP and MRP estimates are available directly, 365 days questions for low frequency items were canvassed in schedule type 2 of rounds 51 to 54 while schedule type 1 of these rounds used 30 days URP. Although direct 30/365 days MRP estimates are not available for these since type 2 schedules used a 7 day recall for food etc., hybrid estimates are possible replacing deciles-wise the 30 day estimates for clothing etc. in schedule 1 with the corresponding 365 day estimates from schedule 2. This is approximate, but unlikely to mislead.

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<sup>42</sup> Correlations between state-level changes in headcount ratios between rounds 43 and 55 and the corresponding changes between rounds 43 and 50 or between rounds 50 and 55 are all in the range 0.55-0.85.

<sup>43</sup> The 55<sup>th</sup> round food adjusted poverty ratios are higher than 43<sup>rd</sup> round MRP in rural areas of South-West Andhra Pradesh, all three regions of Assam, South and Central Bihar, West Haryana, Chattisgarh, Vindhya, South and North Madhya Pradesh, Eastern Maharashtra, South Orissa, Himalayan and Central Uttar Pradesh and Himalayan West Bengal and in urban areas of Assam Eastern Plains, West Haryana, Chattisgarh, North Madhya Pradesh, all three Orissa regions and South-East Rajasthan. As far as the number of poor is concerned, this declined in rural areas of all NSS regions in Kerala and Tamilnadu and in urban areas of both Kerala regions. In all the remaining States, there was at least one NSS region where the number of poor was higher in 1999-00 than in 1987-88.

To begin with, consider poverty counts. Headcount ratios from all full year NSS rounds starting 1977-78 are plotted in charts 3(a), (b) and (c). These are based on official poverty lines available for “thick” samples, extended to “thin” samples using appropriate price indices. The 55<sup>th</sup> round estimates are food adjusted. The separate axes differ only by an intercept shift equal to the average MRP-URP difference during rounds 51-53. The important point to note is that wherever estimates by both recall types are available, their year-to-year movements are similar. This not only adds confidence to earlier comparisons with the 55<sup>th</sup> round but also to comparison across other rounds without common recall. On this basis, adjusted 55<sup>th</sup> round estimates are found consistent with the other 1990s NSS rounds. Thus, properly interpreted, the 55<sup>th</sup> round is not so out of line with earlier 1990s NSS rounds as to require revising conclusions drawn earlier from these.

However, the 1990s “thin” sample estimates do show large variation around the trend from “thick” samples. If these are accepted, poverty reduced well below trend in rounds 45 and 46 (1989-90 and 1990-91), rose very sharply in round 48 (1992) and then fluctuated above trend till round 55 (1999-00) before falling below trend in round 56 (2000-01). Moreover, although declining, the trend rural poverty ratio remained consistently above the low reached in 1989-90. The graphical picture thus bears out the pre-55<sup>th</sup> round consensus: that rural poverty was higher in every 1990s NSS round than at the end of the 1980s. Furthermore, although the rural poverty ratio finally fell below 1989-90 in the 56<sup>th</sup> round, it rose back again in the 57<sup>th</sup> round. Charts 4 (a), (b) and (c) which plot the numbers of poor show that although India’s 1980s poverty reduction performance was not spectacular, with increasing urban numbers eroding rural reduction, the number of poor did reduce to a low in 1989-90. This has been exceeded in every subsequent year - by nearly 20 million in 2000-01 and much more in the other years. Should all this information be ignored?

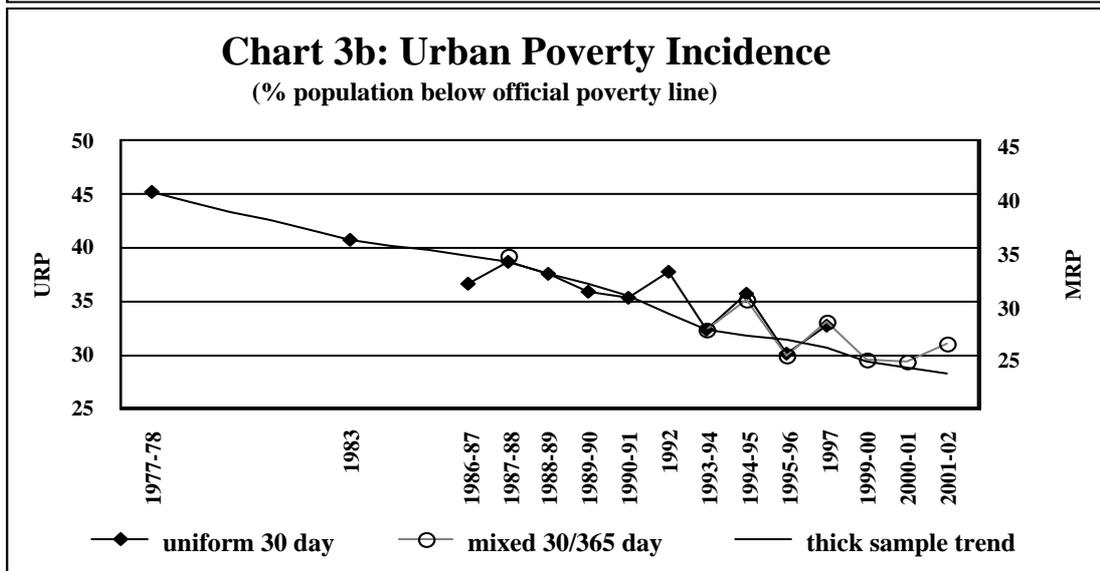
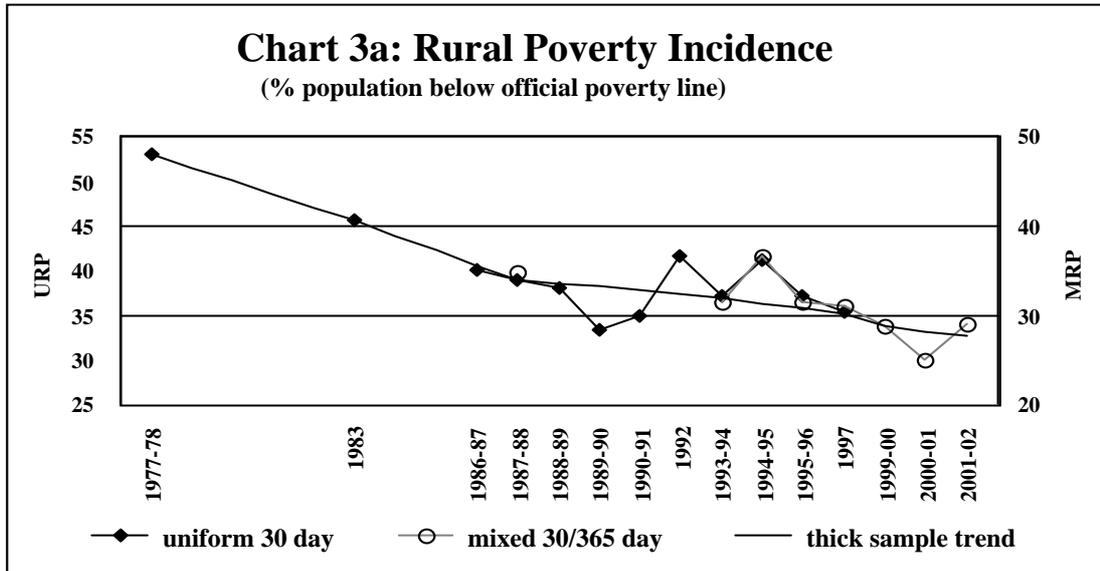
This is important since, in addition to incorrectly small adjustments to the 55<sup>th</sup> round, reversal of pre-55<sup>th</sup> round consensus has involved ignoring the “thin” rounds. These were potential input into time-series analysis not only of an eventful decade for the Indian economy but also of how aggregate world poverty and inequality were affected by economic “reform” in the country with the largest number of poor. But since the unadjusted 55<sup>th</sup> round is totally out of line with previous “thin” rounds, it is not possible for both to be broadly comparable to previous thick rounds. Post-55<sup>th</sup> round data uncertainty has virtually halted the time-series research on poverty change that till recently had grappled and debated the relative impact of various exogenous and policy variables.

This is not the place to detail results of past research that used time-series data. But, since the food adjusted 55<sup>th</sup> round does compare quite well with nearby rounds once the URP-MRP distinction is made, it is appropriate to note that econometric models available had explained much of the large year-to-year poverty variation found in the “thin” rounds above. Although some of these rounds were outliers and different models did differ on exact specification of explanatory variables, research had moved towards agreement that in addition to agricultural and non-agricultural growth, certain other variables such as prices, public expenditure and patterns of growth diffusion (e.g. through rural non-agricultural opportunities) were important<sup>44</sup>. In particular, cereals prices and rural non-farm employment were found to affect rural poverty quickly; and large and opposite movements in these during the late 1980s and early 1990s were identified as possible cause of the large swings observed in poverty ratios. The large poverty decline in 56<sup>th</sup> round can be explained in these terms. Cereals prices fell in 2000-01, reversing large real increase since 1990-91, and NSS also shows rural non-farm activity rising smartly from 1999-00 after large decline since 1989-90.

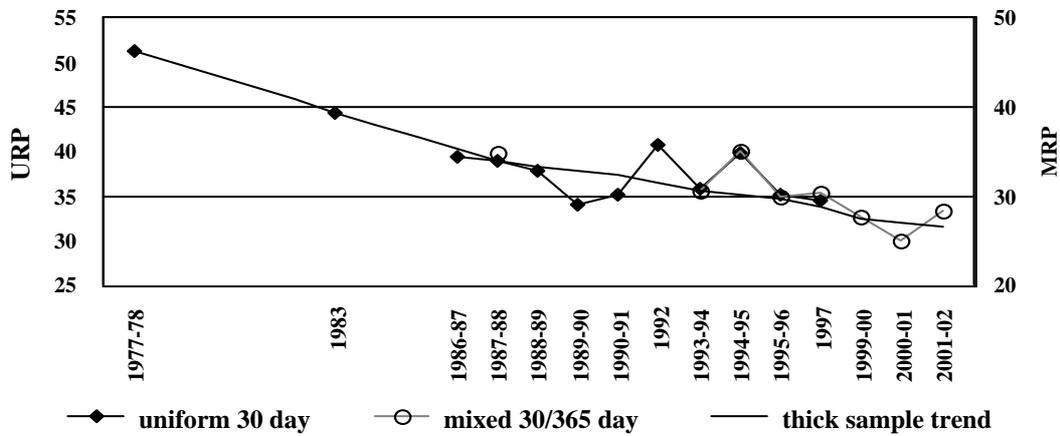
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<sup>44</sup> Early research had established the significance of food prices and agricultural growth. Later research has established importance of public expenditure and the nature of diffusion of non-farm incomes, e.g. Sen (1996, 1997), Datt and Ravallion (1998 and 2002) and Fan et al. (2000) and Lanjouw and Sharief (2000).

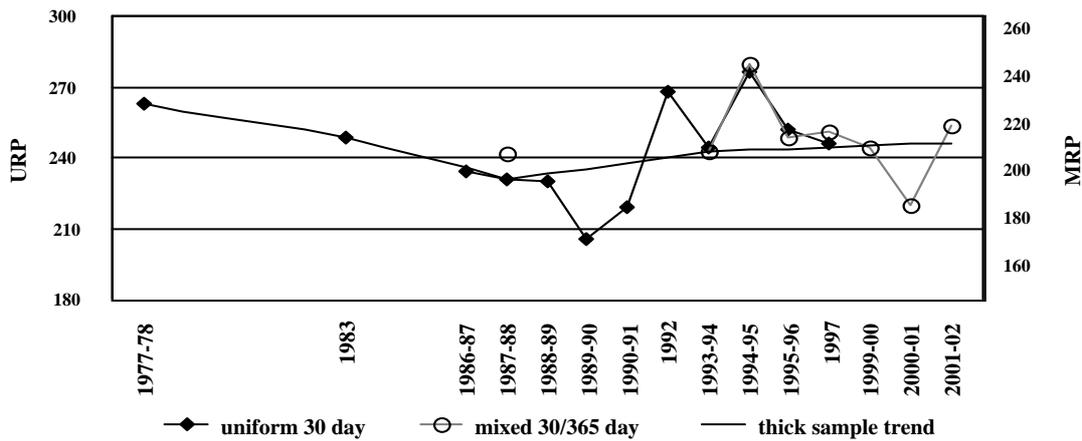
The setback in 57<sup>th</sup> round is less easy to explain but this affected cultivators most and is probably the lagged effect of a poor 2000-01 harvest coinciding with general deflation of farm prices.



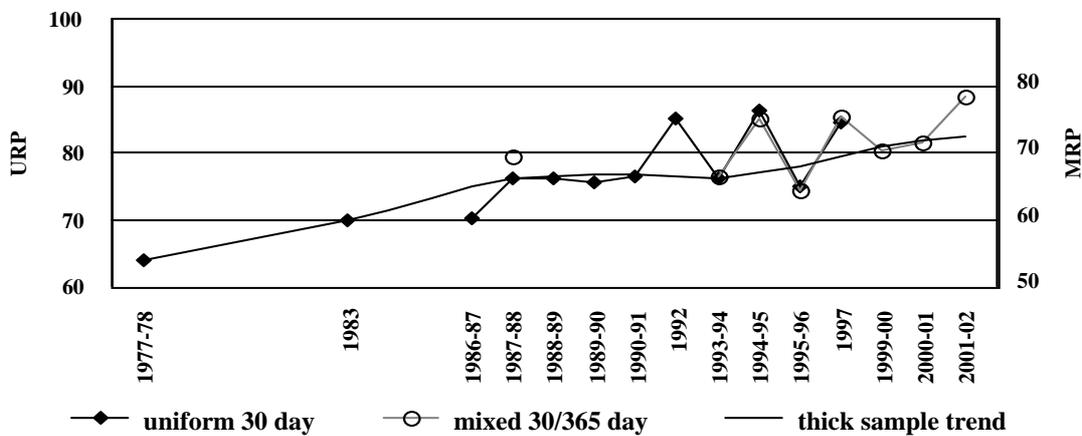
**Chart 3c: Poverty Incidence: Rural+Urban**  
(% population below official poverty line)

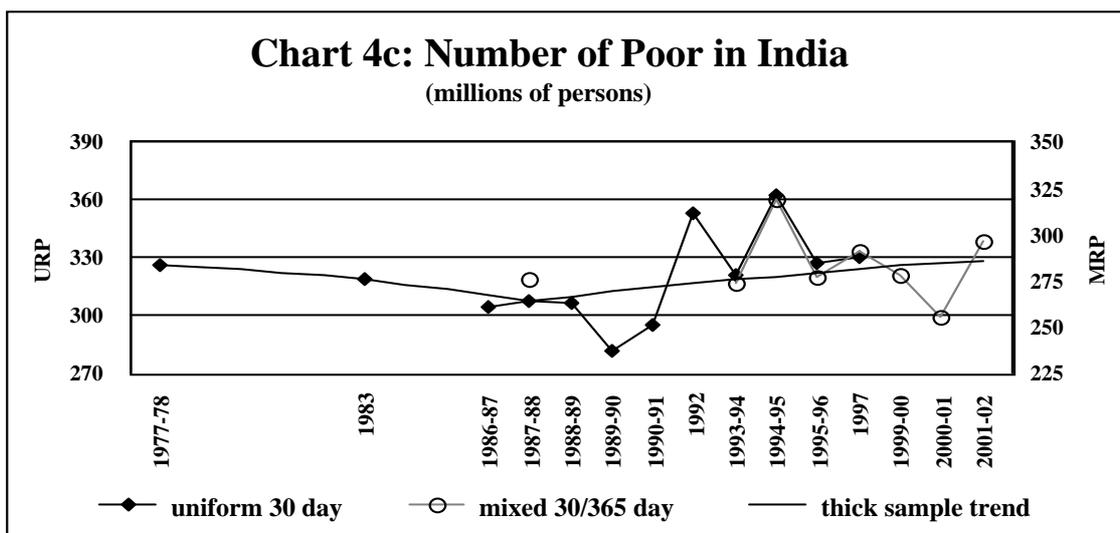


**Chart 4a: Number of Rural Poor**  
(millions of persons)



**Chart 4b: Number of Urban Poor**  
(millions of persons)





**TABLE 12: HEADCOUNT POVERTY RATIOS & COMPARABLE CHANGE**  
(based on official poverty lines)

Year (NSS Round)	Headcount Ratios (% HCR)				Comparable annual change in HCR from			
	Rural		Urban		About 5 years ago		About a decade ago	
	Uniform 30 day	Mixed 30-365 days	Uniform 30 day	Mixed 30-365 days	Rural	Urban	Rural	Urban
<b>1983 (38)</b>	<b>45.6</b>		<b>40.8</b>		<b>-1.4</b>	<b>-0.8</b>	<b>-1.1</b>	<b>-0.6</b>
1986-87 (42)	40.2		36.7					
<b>1987-88 (43)</b>	<b>39.0</b>	<b>(35.2)</b>	<b>38.7</b>	<b>(34.9)</b>	<b>-1.5</b>	<b>-0.5</b>	<b>-1.4</b>	<b>-0.7</b>
1988-89 (44)	38.1		37.5					
1989-90 (45)	33.5		36.0					
1990-91 (46)	35.0		35.3					
1992 (48)	41.7		37.8					
<b>1993-94 (50)</b>	<b>37.2</b>	<b>31.6</b> <b>(31.9)</b>	<b>32.4</b>	<b>27.9</b> <b>(28.0)</b>	<b>-0.3</b> <b>(-0.6)</b>	<b>-1.1</b> <b>(-1.2)</b>	<b>-0.8</b>	<b>-0.8</b>
1994-95 (51)	41.3	36.6	35.7	30.7	1.6 (1.4*)	-0.1 (-0.3*)		
1995-96 (52)	37.1	31.5	30.2	25.5			-0.3 (-0.6*)	-0.7 (-0.8*)
1997 (53)	35.3	31.1	32.7	28.7	0.1 (-0.3*)	-0.4 (-0.4*)		
<b>1999-00 (55)</b>		<b>28.8</b>		<b>25.1</b>	<b>-0.5*</b> <b>(-0.5)</b>	<b>-0.5*</b> <b>(-0.5)</b>	<b>-0.5*</b> <b>(-0.5)</b>	<b>-0.8*</b> <b>(-0.8)</b>

2000-01 (56)		25.0		24.9	-1.9* (-1.9)	-1.0* (-1.0)	-0.3* (-0.4*)	-0.6* (-0.7*)
2001-02 (57)		29.1		26.6				

**Note:** All estimates use the All-India distribution and All-India poverty lines. The MRP in 43<sup>rd</sup> round had 365 day questions only for clothing, footwear and durable goods and the corresponding estimates for round 50 are in brackets. All other MRP estimates used 365 day questions for clothing, footwear, durable goods, education and institutional medical care. MRP estimates for rounds 51 to 53 are hybrid, replacing deciles-wise the 30 day estimates for low frequency items in schedule 1 with corresponding 365 day estimates from schedule 2, and 55<sup>th</sup> round estimates are food adjusted. All other estimates use unadjusted original distributions. Comparable annualised change is either from one thick round to another (in bold), including from rounds 27 and 32, or over the following comparable thin rounds: 42 & 52; 45, 51 & 56; and 46 & 53. Each of these sets had the same principal purpose of enquiry and the same sampling frame. The change figures are on both URP basis (unbracketed) and MRP (bracketed). The change estimates with asterisk are those for which the same reference period was not available from the two rounds compared. These cases involve rounds 42, 45 and 46 for which MRP is not available and it was assumed that the MRP-URP difference was the same as in round 43; and rounds 55 and 56 for which URP is not available and it was assumed that the MRP-URP difference was the same as the average for rounds 51 to 53. Change figures without asterisk are direct, from comparable rounds using comparable reference periods.

Recent Indian discussion has unfortunately neglected proper monitoring of short-run poverty change to focus solely on medium-term trends and on how “reforms” may have affected this. This too has privileged “thick” over “thin” samples, although in fact the latter are of more than adequate size for reliable estimates at the all-India level. Nonetheless, since “thin” rounds differ on principal subjects of enquiry, there could of course be bias if sampling frames or responses are affected. But for every “thin” round after 1993-94, except 57, there is at least one previous round with the same purpose of enquiry and same sampling frame: rounds 56, 51 and 45 (unorganised manufacture), 53 and 46 (unorganised trade) and 52 and 42 (education). There is little reason for all-India trends from these mutually comparable rounds to be less valid than from the thick rounds.

Table 12 presents annualised changes in headcount ratios from all these comparable rounds. With the exception of comparisons involving the 51<sup>st</sup> round, which appears to be an outlier, the picture that emerges is consistent. Quinquennial comparisons suggest acceleration of urban poverty reduction in the late 1980s followed by slow down after the mid-1990s. However, decadal rates of decline obtained from the various 1990s rounds cluster at 0.6-0.8 percentage points per annum, the same as in the two previous decades. On the other hand, for rural areas, quinquennial comparisons show sharp slow-down in poverty reduction during the early 1990s, followed by revival in the late 1990s. Unlike urban, however, the decadal pace of rural poverty reduction is found to reduce very significantly, from 1-1.5 percentage points per annum during 1970s and 1980s to at most 0.5 percentage points per annum in the 1990s. This or lower rates of poverty reduction are found for each full-year rounds 52, 53, 55 and 56 from comparable rounds about a decade earlier (i.e. 42, 46, 43 and 45 respectively). All of these imply that the number of poor increased during the 1990s, by between 3 and 35 million<sup>45</sup>. In other words, mutually comparable nearby “thin” rounds replicate almost fully the conclusion drawn earlier about 1990s poverty reduction from “thick” round comparisons with the food adjusted 55<sup>th</sup> round.

This evidence, that “thin” and “thick” rounds match reasonably on decadal all-India comparison, vindicates both the food adjustment made to 55<sup>th</sup> round data and the “thin” round results usually ignored. Perhaps the most interesting aspect of this is the concordance found between decadal

<sup>45</sup> The lowest increase of 3 million is found comparing the 55<sup>th</sup> round food adjusted to the 43<sup>rd</sup> round MRP. The highest increase of 35 million is comparing the URP from rounds 53 and 46.

comparisons involving rounds 52 and 53 on the one hand and round 56 on the other. The former have been criticised for overestimating poverty compared even to other pre-55<sup>th</sup> rounds and the latter shows less poverty than even the unadjusted 55<sup>th</sup> round. Yet, valid comparisons from these and from adjusted “thick” rounds agree that the earlier trend decline in the number of rural poor was reversed during the 1990s, and also on its broad State-wise pattern<sup>46</sup>. Of course, some States do differently across comparisons, some rounds are outliers even on all-India estimates, and it appears certain that part of the large variation seen over the thin rounds is due to sampling and other differences, which require care in comparison<sup>47</sup>. However, quite apart from reference period change, there were sampling changes in 55<sup>th</sup> round also<sup>48</sup>. All this scarcely justifies ignoring the “thin” samples to concentrate only on interpreting the 55<sup>th</sup> round. Together, the information from each reinforces the other to confirm the pre-55<sup>th</sup> round consensus, not its revision.

The main criticism of pre-55<sup>th</sup> round 1990s NSS data was that this had increasingly underestimated growth. Chart 5a plots, for all full-year NSS rounds since 1977-78, the NSS average real monthly per capita consumer expenditure (MPCE) for all-India (rural+urban) using official poverty lines as deflator. Once again, the 55<sup>th</sup> round estimate is food adjusted and estimates by uniform 30 day and mixed 30/365 days recall are against separate axes with intercept shift equal to average difference

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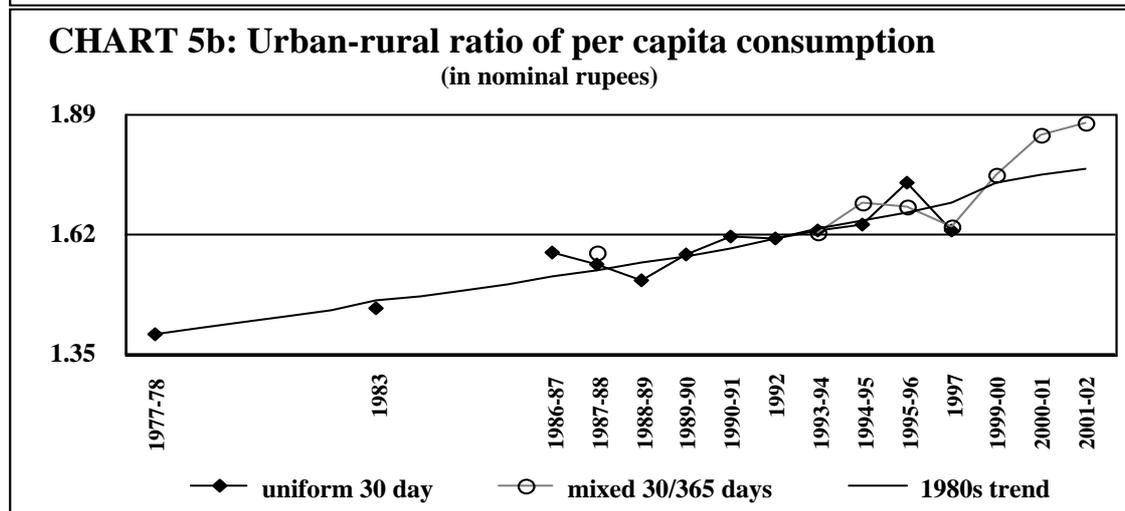
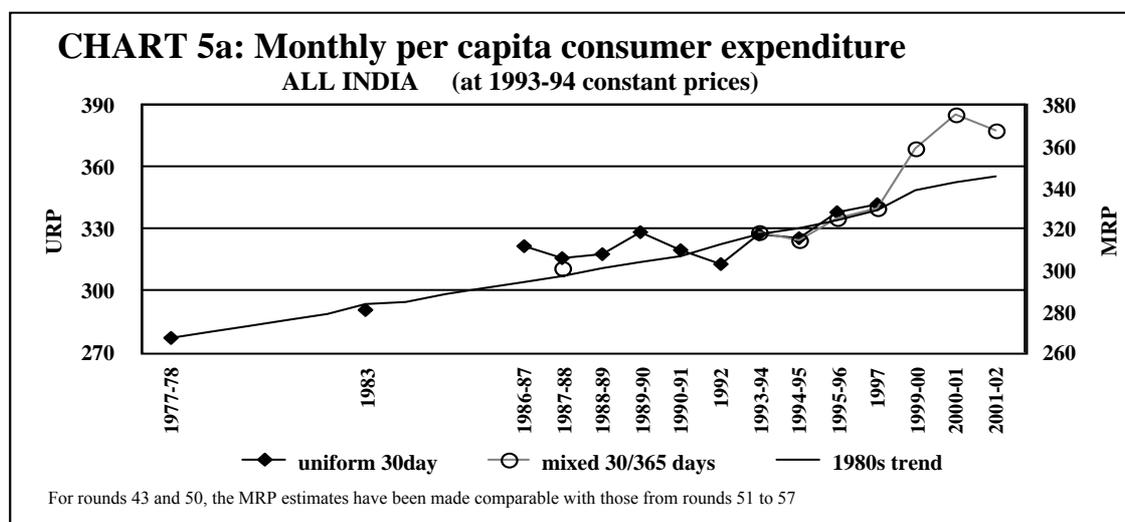
<sup>46</sup> State level results for rural India have been computed for these comparisons. Between 1986-87 and 1995-96, rural poverty ratios increased in Assam, Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh; and decreased by more than 15 percent in Gujarat, Haryana, Kerala, Tamilnadu and West Bengal. Between 1990-91 and 1997, poverty ratios increased in Assam, Bihar, Haryana, Madhya Pradesh, Orissa, Punjab and Uttar Pradesh; and decreased by more than 15 percent in Gujarat, Tamilnadu and West Bengal. Using 43<sup>rd</sup> round state-specific URP-MRP differences to make 45<sup>th</sup> round counts comparable to MRP of 56<sup>th</sup> round, rural poverty ratios increased between 1989-90 and 2000-01 in Gujarat, Madhya Pradesh, Punjab and Uttar Pradesh and the number of poor increased in Assam also; on this comparison, the number of poor declined more than 15 percent in Karnataka, Kerala, Orissa and Tamilnadu. These results, along with earlier comparison of 1987-88 and 1999-00, all agree that rural poverty numbers increased in Assam, Madhya Pradesh and Uttar Pradesh and, except for one comparison each, in Bihar and Punjab as well. These States account for over 45 percent of total rural population in the 15 major States. At the other end, Karnataka, Kerala, Tamilnadu and West Bengal, accounting for 22 percent of rural population in major States, show more than 15 percent poverty reduction in most decadal comparisons without showing poverty increase in any. Andhra Pradesh and Maharashtra, accounting for 16 percent of total rural population, show poverty decline in all these comparisons but do not figure among top performers in any. Thus, as far as ranking by poverty reduction is concerned, there is broad consistency across the different comparisons on the ranking of 11 of 15 major States, accounting for 83 percent of rural population.

<sup>47</sup> In the above comparisons, Gujarat, Haryana, Orissa and Rajasthan figure among States showing increased rural poverty by some comparison and also among best performers by some other comparison. The reason could be either some year-specific event, e.g. weather, which is particularly variable in these States, or survey idiosyncrasy. That survey idiosyncrasy may be relevant is evident in case of the 51<sup>st</sup> round during which experimental schedules with alternative recall were initiated and which, although it had the same subject of enquiry and used the same sampling frame (the Economic Census) as rounds 45 and 56, returned higher poverty and lower estimates of rural non-farm activity compared not only to the trend from these rounds but also compared to neighbouring rounds. Other rounds that used this frame, i.e. 45, 46, 53, 56 and 57, returned systematically higher rural secondary sector activity and lower poverty than rounds that used Population Census as frame, and much more so in some States than in All-India. Also, Census population weighted averages of State poverty counts in rounds 56 and 57 are less than All-India counts using the implicit NSS population weights. Clearly, some of the variation observed over rounds is because of different sampling frames rather than any underlying change in population characteristics.

<sup>48</sup> For example, the 55<sup>th</sup> round involved an enterprise survey for the non-organised sector as well and because of this non-agricultural sub-blocks were over-sampled purposively. This was unlike in any previous round but was repeated in the 56<sup>th</sup> round. This may have contributed to why the 55<sup>th</sup> round measured 18 percent more rural non-agricultural employment than round 53 and why this increased further by 12 percent in round 56. These are orders of magnitude much higher than any likely true increase in rural non-farm employment over a couple of years and, since poverty is related inversely with this, could potentially have introduced an additional downward bias to 55<sup>th</sup> round measured poverty.

in rounds 51 to 53, taking into account that MRP means in rounds 43 and 50 were higher than in other rounds because of 30 day questions for clothing etc. The 1980s trend is also included.

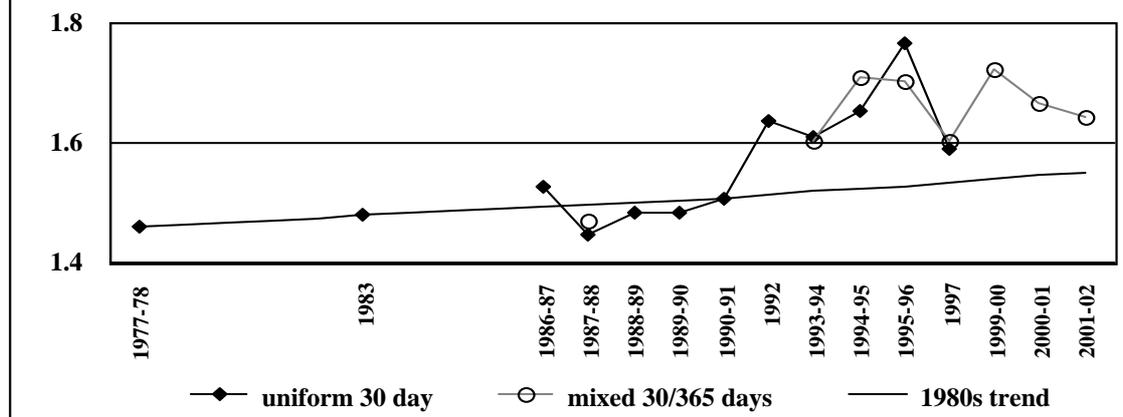
This does show that NSS measured relative stagnation of real per capita consumption in the early 1990s, with MPCE in rounds 42 (1986-87) to 45 (1989-90) above the 1980s trend and rounds 48 (1992) to 51 (1994-95) below. However, MPCEs were back on trend in rounds 52 (1995-96) and 53 (1997) and went well above this in rounds 55 (1999-00), 56 (2000-01) and 57 (2001-02). Since the concern of this paper is consistency and comparability of NSS estimates and not validation, NSS-NAS comparisons can be skirted to note simply that the NAS also shows very sharp deceleration in the early 1990s and that after 1997 NSS growth implicit in the Chart is, if anything, higher than the NAS<sup>49</sup>. It is of course true that the NSS measures lower consumption than the NAS and it is also true that, since NSS-NAS differences enlarged in the 1980s, the difference in levels was larger in the 1990s. But this alone cannot explain the 1990s outcome.



<sup>49</sup> According to the current NAS series with 1993-94 as base, the rate of growth of real per capita private consumption expenditure was 2.0 percent per annum during 1977-78 to 1990-91 and declined to only 0.9 percent per annum during 1990-91 to 1993-94. Corresponding point-to-point growth rates from the NSS series used in Chart 5a are 1.1 and 0.8 percent per annum. Clearly the major growth underestimation in NSS, if any, occurred before the 1990s. From 1997 to 2000-01, the NAS and NSS growth rates are 3.6 and 3.8 percent per annum respectively.

**CHART 5c: Urban-rural ratio of per capita consumption**

(in 1993-94 constant rupees)



**Note:** In Chart 5a, the plotted MRP estimates for the 43<sup>rd</sup> and 50<sup>th</sup> rounds (which had a 30 day question for low frequency items) have been reduced by 4.5 percent to make them comparable to rounds 51 to 57 which only had the 365 day question for low frequency items. In charts 5b and c, only a single axis is used since there is no significant difference in urban-rural MPCE ratios between MRP and URP. The deflation for charts 5a and c is with official poverty lines for rural and urban India extended to thin samples using appropriate consumer price indices. The real MPCE in chart 5a is the population weighted average of rural and urban.

The striking and relevant fact that emerges from these charts is that although comparable NSS real MPCE growth accelerated during the 1990s, the pace of comparable rural poverty reduction fell much short of that achieved earlier. This reinforces the point made by Sen (2000) with pre-55<sup>th</sup> round NSS data that the slower pace of poverty reduction during the 1990s cannot be dismissed by simply repeating *ad nauseam* that the NSS was somehow less able to capture 1990s growth than it had been able to do in earlier decades. In the face of recent assertions by Deaton and Dreze (2002)<sup>50</sup> and Datt and Ravallion (2002)<sup>51</sup>, this point needs to be restated. Poverty calculations use

<sup>50</sup> They write “aside from indicating no poverty decline in the late nineties, the thin rounds also suggest that average per capita expenditure was stagnating during that period - something that is very hard to reconcile with other evidence”. In fact, this is misleading on both counts. First, there was some decline in the headcount ratio between 1993-94 or 1994-95 and 1997, i.e. the thin rounds period that they refer to, although this was at a much slower pace than before the 1990s. Second, the NSS growth rate of real consumption during 1993-97 or 1994-97 was in fact marginally faster than the pre-1990s rate. Deaton-Dreze thus miss the real picture from the NSS during this period: that the rate of poverty reduction was much lower than in the pre-1990s despite growth of average per capita consumption being no less. They also miss an even bigger picture that emerges from available NSS rounds if official deflators are used: that the increase in poverty occurred not during 1994-95 to 1997 but during 1990-91 to 1994-95 when NSS real per capita consumption did fall below the pre-1990s trend, including in the thick 50<sup>th</sup> round. This is missed since Deaton-Dreze do not consider rounds 45 and 46 at all, and in their comparison of the 43<sup>rd</sup> and 50<sup>th</sup> rounds they use Deaton’s alternative deflators which imply both more growth and greater poverty decline. A case does exist against the official deflators, but it is not proper to assess the thin rounds against a thick sample trend thrown up by use of alternative deflators without also deflating the thin rounds alternatively. Deaton and Dreze do not do this.

<sup>51</sup> They write: “Comparing the nominal consumption aggregates from both sources over the period 1972-1997, Sen (2001) finds that consumption by households in India implied by the NSS accounts for 60-70 per cent of the national private consumption implied by the national accounts. Moreover, the divergence between the NSS and the national accounts seems to be growing”. This misinterprets Sen whose essential point was that, although the NSS measures less consumption than the NAS and although this divergence had increased during the 1980s, the divergence between NSS and NAS on nominal consumption did *not* grow during 1990-97 by the then current NAS with base 1980-81. In fact, during the crucial period of poverty increase, i.e. 1990-91 to 1993-94, this divergence did not grow even by the new NAS with 1993-94 as base. In the subsequent period 1993-94 to 1997 there is increased divergence by the new series but not the old, and after 1997 there is again no growth divergence between the NSS and NAS 1993-94. It is surely too much to hang the NSS on such slender evidence from the NAS, especially since Sen had also made two other points.

not only NSS data but also externally derived poverty lines, and the lower poverty reduction measured from NSS throughout the 1990s was despite higher, or at least not much lower, growth of NSS nominal per capita consumption deflated by these poverty lines than in the 1980s. This implies quite unambiguously that the cause of slower poverty reduction during the 1990s should be sought in sources of inequality increase.

One aspect of this is the urban-rural divide. Chart 5b shows that growth of nominal urban MPCE outstripped the rural throughout, and that the differential rose well above the 1980s trend from 1999-00. A more significant trend break, shown in Chart 5c, occurred in the early 1990s and involved underlying deflators which caused the urban-rural gap to increase even more sharply when calculated using real MPCEs implicit in poverty calculations. As discussed in Sen (2000), these differential changes in deflators were very largely a consequence of the much larger weight of cereals in the Consumer Price Index of Agricultural Labourers and of the fact that cereals prices, which had risen less than other prices during the 1980s, increased much more in the early 1990s. Since changes in cereals prices shift incomes between net buyers and net sellers, implicit in this is redistribution within rural areas, from the rich to the poor during the 1980s and from the poor to the rich for most of the 1990s. Another important aspect of this, that high relative cereals prices increase welfare inequality with unchanged income distribution, is missed by inequality measures applied not only to nominal consumption but even real, if obtained by uniform deflation. But although there is no doubt either about movements in relative cereals prices or about increase in nominal urban-rural disparity, Deaton has raised doubts about the extent of increase in real urban-rural disparity. Using NSS implicit prices, he has argued that official deflators overestimated rural, but not urban, inflation during 1987-88 to 1993-94 and thus underestimated rural poverty decline. This has of course nothing to do with the 55<sup>th</sup> round, and analysis after 1993-94 shows less difference. But this is important since near complete agreement exists otherwise on increased real urban-rural disparities as a major source of 1990s inequality increase. By the usual measures, both rural poverty and this disparity (Chart 4a and 5c) jumped sharply in tandem during the early 1990s.

Deaton's alternative deflators do not reverse the conclusion of increased urban-rural disparity. But, while the NSS ratio of urban to rural real MPCEs increased 10 per cent between the 43<sup>rd</sup> and 50<sup>th</sup> rounds by official deflators, as against 5 per cent increase in the nominal ratio, this rose only 2 per cent by Deaton's implicit deflators. Purely as result of this, Deaton estimated a 6 percentage point decline in rural poverty between 1987-88 and 1993-94 as against only 2 percentage points officially. Carried over to the rest of the decade, this implies about 30 million less poor. This has nothing to do with the much-maligned NSS surveys, and in fact Deaton prefers implicit prices from the NSS to the independent price indices used officially. But excessive focus on NSS-NAS difference has resulted in insufficient discussion of the very substantial issues raised thereby.

These cover a very wide canvas, most significantly that official State and sector-specific price deflators mislead on true spatial variations in costs of living and that consequently the resulting region-specific poverty counts are inappropriate input for policy making<sup>52</sup>. Matters are, however, less clear-cut on temporal change. Deaton's deflators cover items which form only part of total consumption and, unlike direct price quotes, changes in implicit prices from the NSS also reflect changes in quality and source, e.g. home produced, market purchase and purchase from the Public Distribution System. Moreover, the matter of appropriate weights to different items raises

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First, that the new NAS was suspect on some important revisions and, second, that the real difference was with deflators used for poverty calculation and those implicit in the NAS and that this has nothing at all to do with the NSS.

<sup>52</sup> State and sector specific official poverty lines are in any case flawed since the 1993 Expert Group had applied inter-state differentials for 1963-64 to price indices with different base without correcting for the intervening price change.

interesting conceptual issues quite apart from the usual index number problems. Given much higher increase in cereals prices relative to other prices during this period and the fact that the cereals share in consumption has been falling, it is not surprising that base weighted official deflators show higher inflation than current weighted or “ideal” indices. There is of course warrant from consumer theory, rooted in the principle of consumer sovereignty, to take shifts in consumption patterns into account and prefer the latter as measures of cost of living. But, it is not evident that this is preferable to a fixed base-year basket, or consistent, when carrying forward a poverty line from 1973-74 which was rooted on a nutrition norm and thus on a welfare criterion which put particular emphasis on affordability of adequate nutrition<sup>53</sup>.

Similarly, the implication from Deaton’s deflators that real urban-rural disparity increased less than nominal between 1987-88 and 1993-94 obtains some support from official measures of the domestic terms of trade of agriculture. The latter had improved quite substantially from the mid 1980s to the mid 1990s, before subsequent decline. However, since improvement in agriculture’s terms of trade during this period was almost entirely a result of higher cereals prices, involving relative loss not only for agricultural labourers but also for cultivators of other crops, this brings back the issue of inequality implications of relative cereals prices.

There are, therefore, strong reasons to be sceptical about official poverty lines, particularly at State and sector levels and on their ability to capture shifting tastes even at the national level. But counter-arguments can also be offered to prefer these to Deaton’s, i.e. greater proximity to (and consistency with) consumption weights near the poverty norm and greater completeness both in item coverage and as time series. Nonetheless, the issues raised by Deaton are important enough to require a new expert group to re-examine existing poverty lines and the methods used to update these. Till then, there is really no alternative to the official deflators for deriving comparable poverty estimates over time although different *levels* of State and sector specific poverty lines can be adopted as is already done by some independent researchers. On this basis at least, the data underlying Charts 5 b and c do confirm a large increase in urban-rural disparity and also that, except for an absolute decline in cereals prices in 2000-01, nothing of substance has changed after the 55<sup>th</sup> round to alter the detailed analysis offered on this in Sen (2000 and 2002a and b).

Turning to inequality within the urban and rural sectors, charts 6 a and 6 b plot Gini indices of nominal consumption at the all-India level for all full-year NSS rounds since round 32 (1977-78). As before, estimates by uniform 30 day and mixed 30/365 days recall are against separate axes, with Ginis from schedule 2 of rounds 51 to 53 plotted against the 30/365 day axis. Again, the axes are aligned with an intercept shift equal to the average difference found in the URP and MRP from rounds 51 to 53. In interpreting these charts it should be remembered that, as discussed in section II, presence of 30 day questions for clothing etc. caused the 30/365 day distribution in the 43<sup>rd</sup> and 50<sup>th</sup> rounds to be more unequal and thus non-comparable to the other rounds for which MRP estimates are available based on only the 365 day question. The Charts also include fitted trends incorporating a kink after 1992, which are statistically significant.

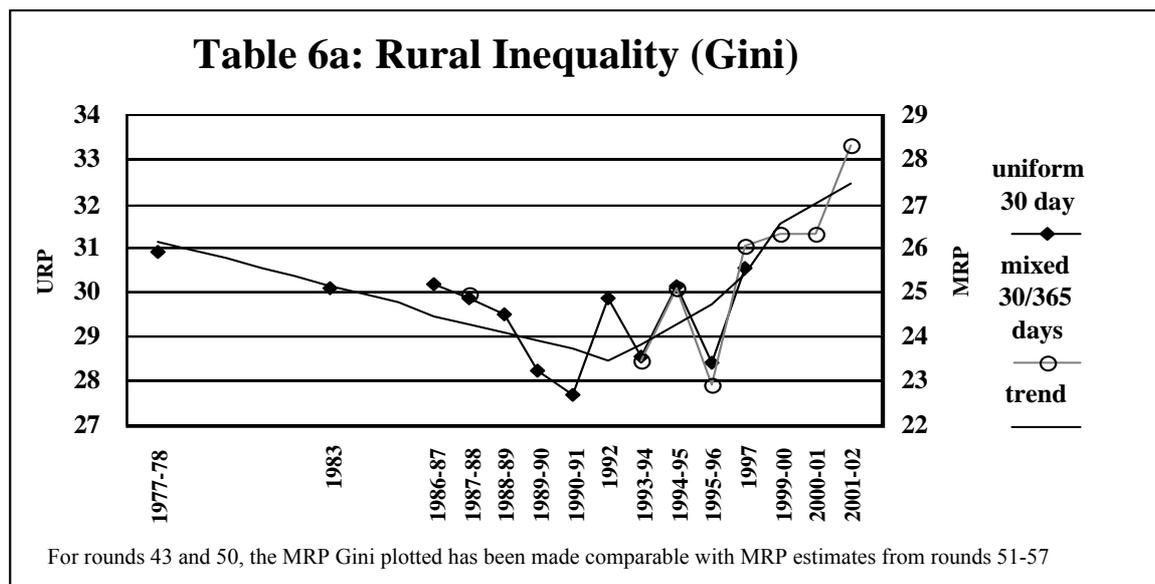
These charts suggest that, despite claims to the contrary, e.g. by Bhalla (2003) and Singh et.al. (2003), inequality of nominal consumption increased during the 1990s, and was particularly sharp in urban areas. The contrary view is based on simple comparison of the 55<sup>th</sup> with earlier rounds. For example, the rural Gini in the 55<sup>th</sup> round was 26.4 as against 28.6 in the 50<sup>th</sup> round. However,

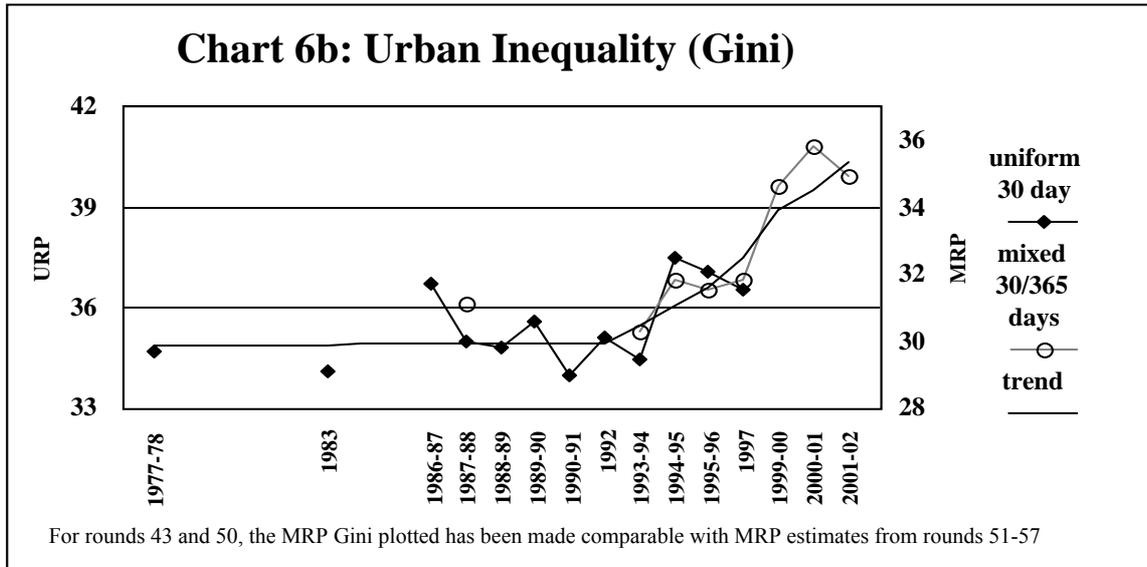
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<sup>53</sup> The official deflation procedure has been criticised as being inconsistent with this norm, e.g. by Mehta (2001) and Patnaik (2002) who note correctly that poverty reduction is much less using the direct calorie cut-off. Official deflators ensure at least that the original food bundle even if not actually consumed is affordable at the poverty line. Any shift from base to “ideal” weights risks losing even this link between the original nutrition norm and later poverty lines.

this comparison is incorrect because the Ginis in the 50<sup>th</sup> and earlier rounds are based on 30 day recall for clothing etc. and, as discussed in section II, the 55<sup>th</sup> round's 365 day recall for clothing etc. reduces measured inequality very considerably. Thus, in the 50<sup>th</sup> round, which had both the 30 and 365 day questions, rural Ginis were 28.6 and 25.8 by these two recalls; and these averaged 29.7 and 24.8 in rounds 51 to 53 where the two recalls were put to separate samples. Adjusted for the fact that the 55<sup>th</sup> round used only the 365 day recall, the correct change in rural inequality between the 50<sup>th</sup> and 55<sup>th</sup> rounds is almost 3 Gini point increase rather than a 2 Gini point decline.

Since the effect of shift to MRP on measured inequality is crucial to appreciate 1990s trends, table 12 provides fractile-specific MPCE estimates, for bottom 40%, next 40% and top 20% rural and urban, for all full year rounds 32 onwards. The MRP-URP ratios from rounds with both recalls are linkage factors similar those used to splice different series of index numbers. As discussed earlier, there are three different MRP specifications: MRP43 used in the 43<sup>rd</sup> round where both 30 and 365 day questions were put to all respondents for clothing, footwear and durable goods, MRP50 used in the 50<sup>th</sup> round where again both 30 and 365 day recalls were asked to the same sample but for education and institutional medicine as well, and MRP51-57 used in rounds 55 to 57 and also in schedule 2 of rounds 51 to 54 where only the 365 day recall was used for items where this recall was used in the 50<sup>th</sup> round. Of these, MRP43 and MRP50 are very similar but MRP51-57 does differ, though only in case of the top quintiles for which it returns much lower MPCEs. Chart 7 presents indices of real MPCE on URP basis by fractile groups, applying linkage factor B from table 12 to MRP estimates for rounds 55 to 57 and using the NAS consumption deflator.





**NOTES:**

The trends plotted above are from the following fits obtained from the data in the charts:

For rural areas:

$$G = 394.7 + 5.05*D1 + 2.33*D2 - 0.19*T + 0.64*T1; \quad R^2 = 0.85$$

(7.14)    (2.45)    (3.02)    (4.21)

For urban areas:

$$G = 29.26 + 4.67*D1 + 1.58*D2 + 0.00*T + 0.57*T1; \quad R^2 = 0.79$$

(6.50)    (1.67)    (0.01)    (3.71)

where G is the Gini index, T is time, T1 is 0 till 1992 and thereafter the number of years elapsed since 1992, D1 is a dummy with value 1 if the estimate is by the uniform 30 day recall and 0 otherwise, and D2 is a dummy which is 1 only if the estimate is by the 30/365 day recall but the 30 day question for clothing etc. is also present. Figures in parenthesis are t-values. It may be noticed that both dummies are significant, implying that estimates by the 30 day recall return a higher Gini and that presence of the 30 day question also increases the Gini by the 30/365 day recall.

The trend lines are drawn with D1=1 and D2=0

In order to make them comparable with rounds 51 to 57, the plotted values of the MRP Ginis of rounds 43 and 50 (where D2 was equal to 1) have been reduced by the coefficients of D2 in the fits above. All the other Ginis plotted are unadjusted. For rounds 51 to 53, URP Ginis are from schedule 1 and MRP from schedule 2.

**TABLE 13: FRACTILE SPECIFIC NOMINAL MPCE BY DIFFERENT RECALLS AND DERIVED LINKAGE FACTORS**

Year (NSS Round)	RURAL			URBAN		
	Bottom 40%	Next 40%	Top 20%	Bottom 40%	Next 40%	Top 20%
<b>URP estimates</b>						
1977-78 (32)	36	63	147	49	94	215
1983 (38)	62	109	221	87	159	361
1986-87 (42)	78	138	274	113	215	527
1987-88 (43)	88	150	312	121	227	533
1988-89 (44)	99	167	342	134	250	585
1989-90 (45)	110	187	353	147	271	655
1990-91 (46)	118	200	376	165	309	685
1992 (48)	140	238	481	193	368	869
1993-94 (50)	162	271	541	228	427	980
1994-95 (51)	176	290	612	239	454	1154
1995-96 (52)	202	331	656	287	541	1347
1997 (53)	221	375	785	309	585	1436
<b>MRP43 estimates</b>						
1987-88 (43)	93	153	294	128	235	514

1993-94 (50a)	174	283	523	243	446	965
<b>MRP50 estimates</b>						
1993-94 (50)	174	283	519	243	446	948
<b>MRP51-57 estimates</b>						
1994-95 (51)	187	296	514	258	475	1039
1995-96 (52)	219	340	560	310	556	1096
1997 (53)	234	382	671	331	603	1252
1999-00 (55)	287	466	873	410	780	1799
2000-01 (56)	298	487	902	440	853	1986
2001-02 (57)	286	488	942	465	884	1977
<b>Linkage factor A: ratio of MRP43/50 to URP</b>						
1987-88 (43)	1.057	1.020	0.942	1.058	1.035	0.964
1993-94 (50a)	1.074	1.044	0.967	1.066	1.044	0.985
1993-94 (50)	1.074	1.044	0.959	1.066	1.044	0.967
<b>Average</b>	<b>1.068</b>	<b>1.036</b>	<b>0.956</b>	<b>1.063</b>	<b>1.041</b>	<b>0.972</b>
<b>Linkage factor B: ratio of MRP51-57 to URP</b>						
1994-95 (51)	1.062	1.022	0.840	1.079	1.047	0.900
1995-96 (52)	1.080	1.027	0.853	1.083	1.028	0.814
1997 (53)	1.059	1.018	0.856	1.070	1.030	0.872
<b>Average</b>	<b>1.067</b>	<b>1.022</b>	<b>0.850</b>	<b>1.077</b>	<b>1.035</b>	<b>0.862</b>
<b>Linkage factor C: ratio of MRP43/50 to MRP51-57 (ratio of linkage factors A and B)</b>						
<b>Average</b>	<b>1.001</b>	<b>1.014</b>	<b>1.125</b>	<b>0.987</b>	<b>1.006</b>	<b>1.128</b>

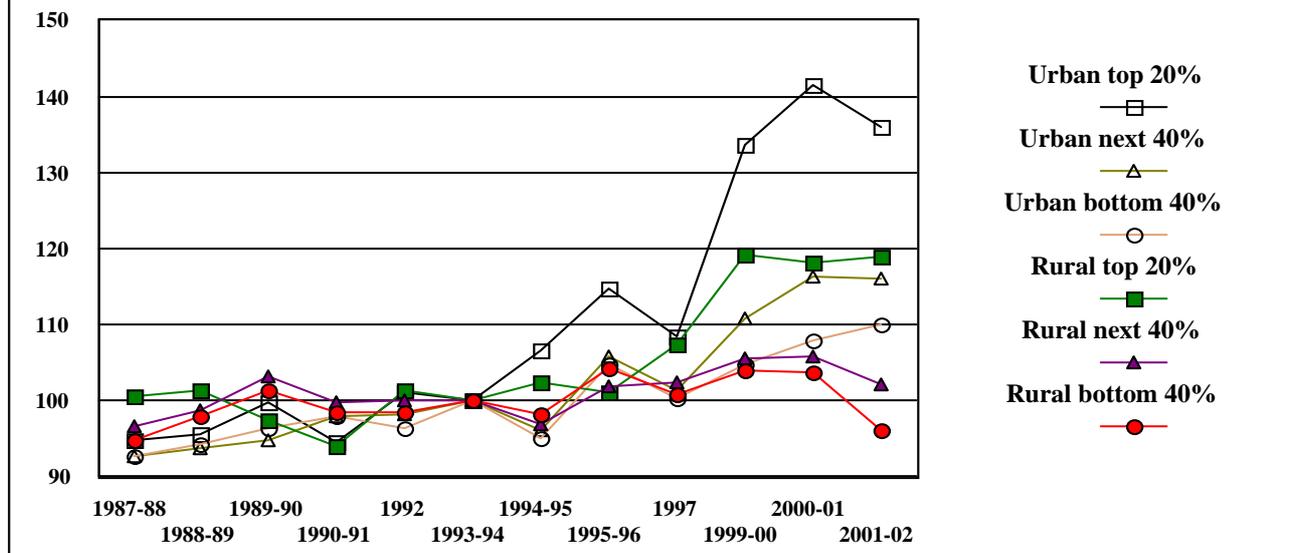
**Note:** MPCEs for 55<sup>th</sup> round are food adjusted and for rounds 51-53 these are hybrid, replacing deciles wise the 30 day consumption estimates of low frequency items in schedule 1 with 365 day estimates from schedule 2

**TABLE 14: COMPARABLE RATES OF GROWTH OF FRACTILE SPECIFIC REAL MPCE**

	<b>Rural</b>			<b>Urban</b>		
	Bottom 40%	Next 40%	Top 20%	Bottom 40%	Next 40%	Top 20%
1977-78 to 1987-88	1.43	1.16	0.01	1.53	1.31	1.57
1983 to 1993-94	1.01	0.54	0.39	1.04	1.28	1.38
1986-87 to 1995-96	1.54	0.67	0.65	1.29	1.21	1.37
1987-88 to 1999-00	0.78	0.73	1.41	1.02	1.48	2.88
1989-90 to 2000-01	0.21	0.24	1.76	1.03	1.87	3.22

**Note:** The deflator used is the NAS deflator for private consumption expenditure

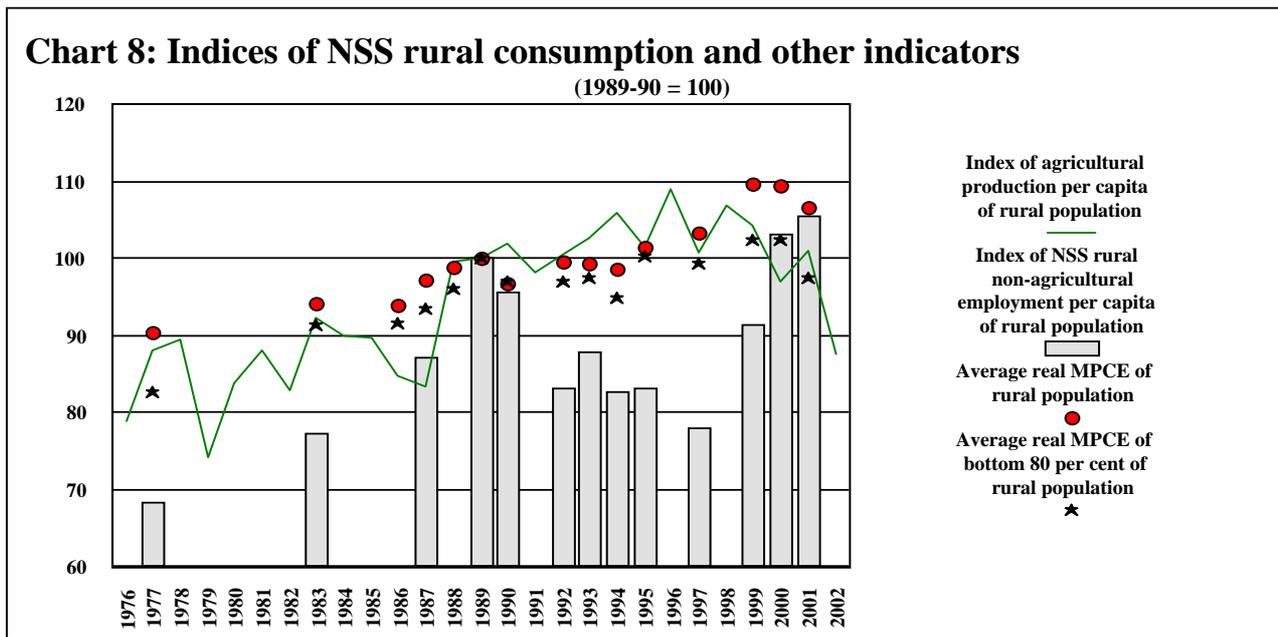
**Chart 7: Indices of real per capita consumption by fractile groups**



These indices (with base 1993-94) in Chart 7 and their annualised decadal growth rates in table 14 (over comparable rounds identified in table 12) must remain somewhat tentative since, owing to presence of 7-day food questions in schedule 2 of rounds 51 to 53, the estimates used to compute linkage factors B are hybrid. On the other hand, so long as the procedure is approximately correct, these indices and growth rates underestimate true 1990s inequality increase because the same deflator (for overall aggregate consumption expenditure) is used for all fractile groups, ignoring that inflation was higher for items consumed by the poor during most of 1990s. Moreover, even nominal inequality increase may be underestimated since there are strong reasons to believe that survey capture is poorer at the upper tail.

Nonetheless, if accepted, the procedure leads to the conclusion that the 1990s, particularly during its second half, saw very large increases in consumption of the relatively rich. The 40 percent increase in real consumption of the top urban quintile during 1993-2001 is not only unprecedented since Indian surveys began but also, involving more than 50 million people, rare internationally. The nearly 20 percent increases for the top rural quintile and the next urban 40% (involving over 250 million people) are also higher than rates recorded previously for these fractiles. Further, although much lower than above, the consumption increase of bottom 40% urban (about 100 million) was not significantly less than recorded for this group during the 1970s and 80s. Up to this point, the picture is consistent with claims of unprecedented growth and prosperity post-“reform”.

But the picture is no longer shining when it comes to the bottom 80 percent of the rural population, numbering almost 600 million. Real NSS per capita consumption of this vast majority of Indians had increased at 1-1.5 per cent per annum (and more if differential cereals price movements are taken into account) during the 1970s and 80s. But, from chart 7, their 1990s consumption was less in most years than was reached in 1989-90, and the maximum attained since then (in 1999-2001) only about 3 per cent higher. It would of course be exaggeration for anyone to claim from this that the poor got poorer as the rich got richer during the 1990s. But, the distortion involved in such a claim would appear minor compared to previous claims made from the same data. At least, this is what underlies the finding here of insignificant poverty reduction during the 1990s.



Moreover, these NSS rural consumption indices are consistent with independent data on agricultural production and rural non-farm employment. Sen (2000) had validated NSS rural consumption estimates till 1997 against NAS and other data, and had argued that the much discussed NSS-NAS differences in mean consumption are overwhelmingly urban and cast much less doubt on NSS based estimates of rural poverty. Subsequent NSS rounds do show large increase in rural non-agricultural employment from an earlier collapse during the 1990s. But, as chart 8 brings out, this just about restored late 1980s levels and accompanied a decline in the official Index of Agricultural Production (IAP) relative to rural population. Indexed at 1989-90, per capita IAP and NSS rural non-farm employment averaged only 100.9 and 100.0 during triennium ending 2001-02 - in marked contrast to previous trends. Given this, claims of greater 1990s poverty reduction (or, indeed, of any significant 1990s rural poverty reduction) are difficult to sustain unless these indicators of rural growth are questioned or some counter evidence produced to show that the distribution of rural incomes did improve substantially.

Perhaps because of this, Sundaram (2001), Deaton and Dreze (2002) and Bhalla (2003) have all relied on evidence of rising real agricultural wage rates for external support to their claims of large 1990s rural poverty reduction. The different time-series available agree that, although less than during the 1980s, 1990s growth of real agricultural wage rates averaged 2 to 3 percent per annum at the national level and exceeded the growth per capita of either IAP or NSS rural consumption<sup>54</sup>. If wage rates were accurate measures of per capita incomes of agricultural labourers, this would indeed imply improved distribution of rural incomes, benefiting the poorest section of India's rural population. But since incomes depend not only on wage rates but also on days of employment, this needs to be taken into account to put matters in correct perspective.

<sup>54</sup> NSS real agricultural wage rates increased 4.2% per annum from 1983 to 1987-88, 1.6% per annum from 1987-88 to 1993-94 and 2.8% per annum from 1993-94 to 1999-00. Data from Agricultural Wages in India and Comprehensive Scheme for Studying the Cost of Cultivation of Principal Crops in India also show real wage rate growth at about 2% per annum during the 1990s, down from about 5% during the 1980s, but unlike NSS do not show acceleration in the mid-1990s. In this context, it should be noted that the NSS had specifically excluded overtime payments from wage rates before the 55<sup>th</sup> round but included these in 1999-00. This is yet another instance where 55<sup>th</sup> round innovation may have biased results towards a rosier picture than would be obtained if earlier survey concepts had been retained.

On this, the NSS reflects an underlying 1990s reality, corroborated by independent evidence<sup>55</sup>: that per capita incomes of agricultural labourers lagged behind wage rates because their numbers grew much more than available days of wage employment. The NSS estimates that the percentage of rural population in agricultural labour households increased from 27.6 to 31.1 between rounds 50 (1993-94) and 55 (1999-00), implying 3.7 percent annual growth of this population. Against this, it reports less than 1.5 percent annual growth of wage paid days of employment in agriculture. The consequent decline, through unemployment and lower work participation, of days of employment per member of agricultural labour households makes consistent why although NSS reports real wage rate growth of 2.8 percent per annum during 1993-2000, much higher than of rural MPCE, it reports per capita consumption of these households increasing less than the rural average<sup>56</sup>.

This digression, which is cautionary against use of wage rates as proxy for income when other evidence suggests a growing employment deficit, plugs the main external support claimed by those who read large 1990s rural poverty reduction into recent NSS data<sup>57</sup>. However, it is also clear that the source of 1990s within-rural inequality increase was not factorial. With urbanisation slowing down during 1990s despite faster growth in urban incomes and with farm incomes at best stagnant in most parts of the country after 1996-97, this was largely an outcome of demographic pressure and of very uneven rural linkages with the highly unequal urban growth<sup>58</sup>. The big picture, even ignoring other dimensions of true inequality, e.g. the effect of relative price shifts on the poor and inability of NSS to capture consumption of the rich adequately, is that measured 1990s increase in nominal inequality caused consumption of the rural poor to rise at most a fifth, and of the urban poor only half, of the average national per capita real growth measured by the NSS.

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<sup>55</sup> For example, data on 21 major crops in 14 major states from the Comprehensive Scheme for Studying the Cost of Cultivation of Principal Crops in India (CS) show that total payments to hired labour increased at 3.1 percent per annum in real terms (i.e. deflated by the CPIAL) during the 1990s, made up of over 2 percent per annum growth in real daily wage rates but only 1 percent growth in days of hired labour employed in the production of these crops. Simultaneously, real farm business incomes (i.e. value of crop output less paid out costs including payments to hired labour) grew at only 1.5 percent per annum. But although the share of labour in total crop income did increase quite significantly as a result, this does not imply that incomes of labourers increased more than that of cultivators. With the Population Census showing that the number of agricultural labourers increased at 3.7 percent per annum over 1991 to 2001, and that of cultivators only 1.4 percent per annum, this actually implies decline in real hired labour payments per agricultural labourer and marginal increase in real farm business income per cultivator. However, this excludes horticulture and livestock and analyses costs and returns of only major crops. See Sen and Bhatia (2002) for details.

<sup>56</sup> To maintain consistency with data elsewhere, 55<sup>th</sup> round consumer expenditure of agricultural labour households (ALH) are from CES, which shows both this and their population share (reported above) somewhat higher than EUS. The CES 55<sup>th</sup> round MPCE of ALH is Rs 386 unadjusted and Rs 380 food adjusted, against 50<sup>th</sup> round MPCE of Rs 217 and Rs 224 by URP and MRP. Food adjusted, this implies a CPIAL deflated real increase of 6.5 percent over these six years. This is significantly less than for the rural population as a whole (8.9 percent) when corrections outlined above are made to 55<sup>th</sup> round both for its overestimation of food expenditure and its underestimation of expenditure on 365 day items by the top quintile. It may also be noted that MPCE of ALH corresponds closely in both rounds to their implicit income as obtained by multiplying wage rates with days of employment. The 55<sup>th</sup> round EUS reports average daily employment rate of 35.7 per cent (28.2 wage paid and 7.5 self-employed) per member of ALH against 38.1 per cent (29.9 wage paid and 8.2 self-employed) in the 50<sup>th</sup> round. The reported average daily wage earnings of casual labourers in agricultural operations were Rs 18.98 and Rs 35.62 in rounds 50 and 55. Using these for returns to self-employment also, gives an average ALH monthly per capita income of Rs 217 (i.e.  $.381 \times 18.98 \times 30$ ) in 50<sup>th</sup> round and Rs 381 ( $.357 \times 35.62 \times 30$ ) in the 55<sup>th</sup>. Compare these with the MPCE of ALH reported above.

<sup>57</sup> The most convoluted argument is Bhalla (2003). With NSS wage rates as proxy for rural income growth he projects from 1983 to arrive at a poverty ratio of only 12 percent in 1999-00. He ignores that the 1999-00 wage rates, which he does accept, imply 44 percent poverty ratio in agricultural labour households at current employment. This alone contributed to over 12 percent rural poverty, even ignoring the poor in the remaining 70 percent of rural population.

<sup>58</sup> Across rural household types, MPCE increase over 1993-2002 was least among the 'self-employed', especially farmers who are least mobile, and highest among 'non-agricultural labour' and 'others' who are most urban-linked.

Nonetheless, although these results from adjusted NSS data may disturb the priors of some, it may be noted that of the distributional data presented so far, the 1990s urban Gini increase was similar to that in China, the percentage increase in nominal urban-rural ratio was two-thirds the Chinese, and the rural Gini increase in India was less than half. This still leaves space to argue that India's relative failure was in growth not distribution, provided of course that the unequal growth observed in both countries is considered inevitable and put beyond policy discourse.

In this context, an aspect of inequality of particular importance in these continental countries is the regional dimension. In discussions of world inequality, where inclusion or exclusion of just these two giants can alter conclusions completely, it has been suggested that different results may follow if regions and sectors within these are treated like different countries. This is of course of greater relevance to China where between-region inequalities accounted for a much larger part of total inequality before 1978 and both between and within inequality have increased massively since then. But in India too, where almost every other aspect of 1990s poverty and inequality is hotly contested, there is general agreement that regional inequality did increase significantly.

Since this is a matter where longer-term trends are of interest, Charts 9 a, b and c cover the period 1959-60 to 2001-02 (using all full-year NSS rounds from 15 to 57) and plot population-weighted standard deviation of logarithms of nominal average MPCE across 15 major states. As before, these are calculated with both uniform 30 and mixed 30/365 day recalls, with the latter for rounds 51 to 53 derived from schedule 2, replacing 7 day estimates for food etc by corresponding 30 day estimates from schedule 1. For the 55<sup>th</sup> round, estimates are from section II as corrected for presence of 7-day questions. The Charts also include two different fitted trends to analyse changes over time. The first is a fourth degree polynomial, which picks up turning points endogenously, and the second a kinked trend fit with three imposed breaks: "green revolution" after 1966, introduction of "rural development" in 1976, and adoption of economic "reforms" after 1991.

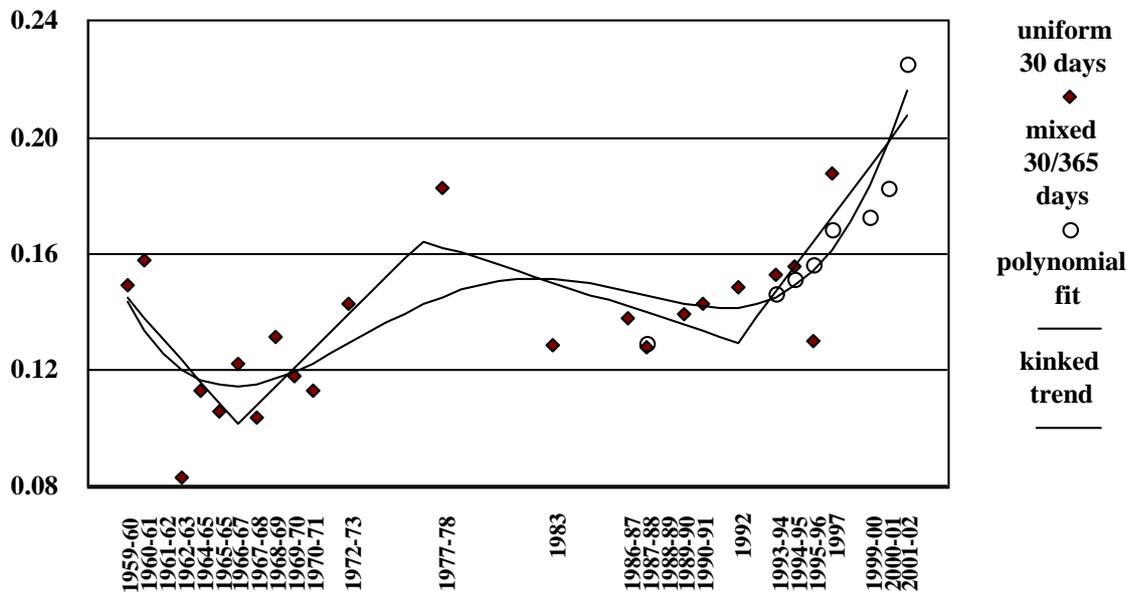
The "green revolution" had reversed an earlier trend of decreasing inter-State rural disparities. But, after increasing for about a decade from its onset in the late 1960s, this was reversed again after the mid-1970s. If, anything, inter-State rural inequality declined during the 1980s. Inter-State urban inequality had declined continuously till the mid-1980s. Considering both rural and urban, inter-State variance of per capita average consumption remained stable during the 1980s. For the 1990s, these charts reproduce with NSS data a result obtained by Ahluwalia (2002) using per capita State domestic product. There is clear and statistically significant evidence of a trend break from the 1980s, into large and sustained increase in inter-state inequality, both rural and urban. Also, this increase in inter-state inequality of NSS consumption, by about 50% by the measure used, is somewhat larger than reported by Ahluwalia for income, implying that inter-state transfers and remittances failed to mitigate growing regional income inequality.

The above is consistent with Deaton-Dreze's claim of growth "divergence" (i.e. higher growth of per capita consumption in States where this was initially high) between rounds 50 and 55. But, as found earlier about their claim regarding poverty "divergence", the evidence is weak<sup>59</sup>. Tests of "divergence" are very sensitive and not robust to choice of deflator or adjustment. That "divergence" is not necessarily implied by, nor implies, increase in population-weighted inequality measures applied across regions is also a lesson from recent research on world inequality.

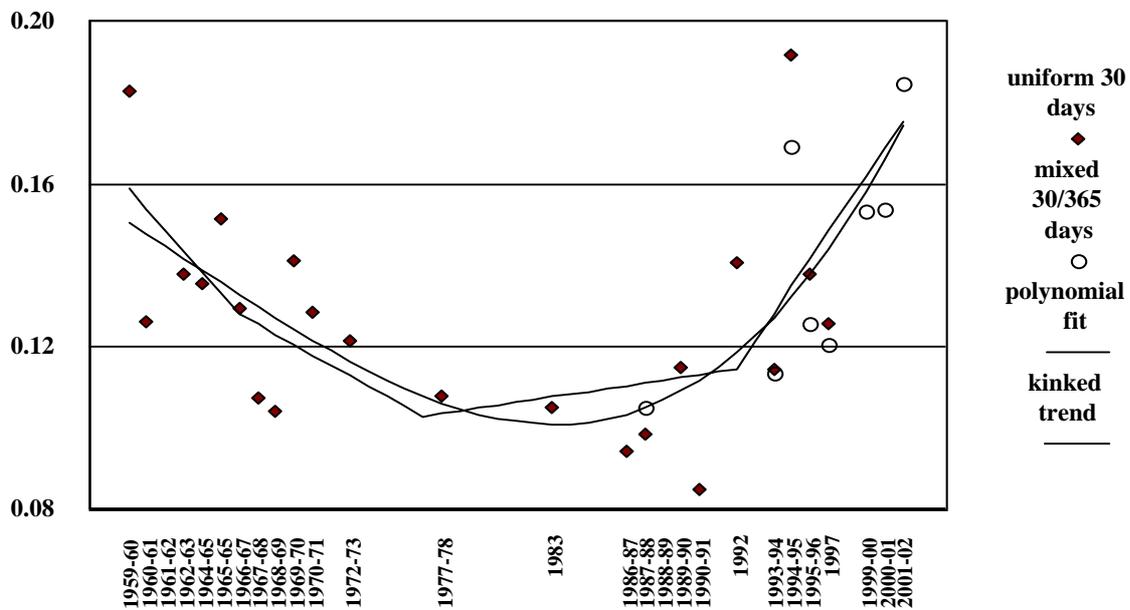
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<sup>59</sup> The correlation between 50<sup>th</sup> round nominal MPCE (urban+rural) using MRP and its growth between rounds 50 and 55 is only 0.32 across the 15 major States, much lower than what Deaton-Dreze report using their adjusted 55<sup>th</sup> round data deflated by their state-specific cost of living indices.

**Chart 9a: Between States Inequality: Rural**  
 (population weighted std deviation of logs of nominal mpce)

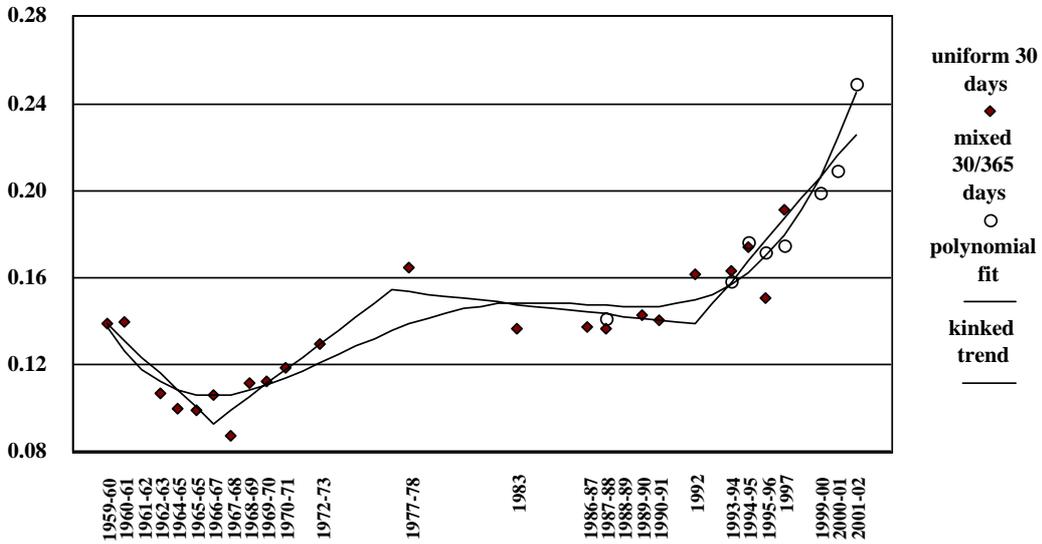


**Chart 9b: Between States Inequality: Urban**  
 (population weighted std deviation of logs of nominal mpce)



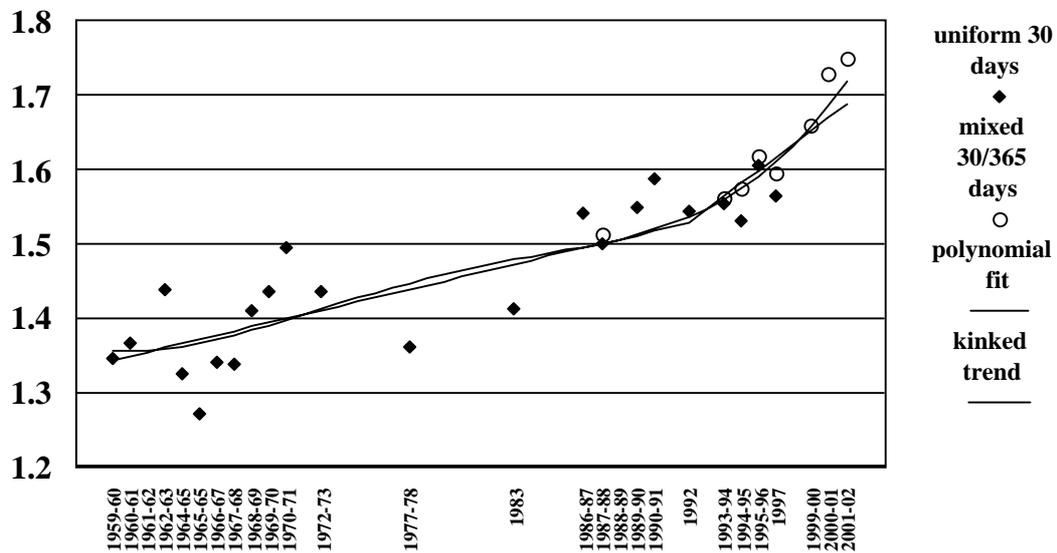
### Chart 9c: Between States Inequality: Rural+Urban

(population weighted std deviation of logs of nominal mpce)

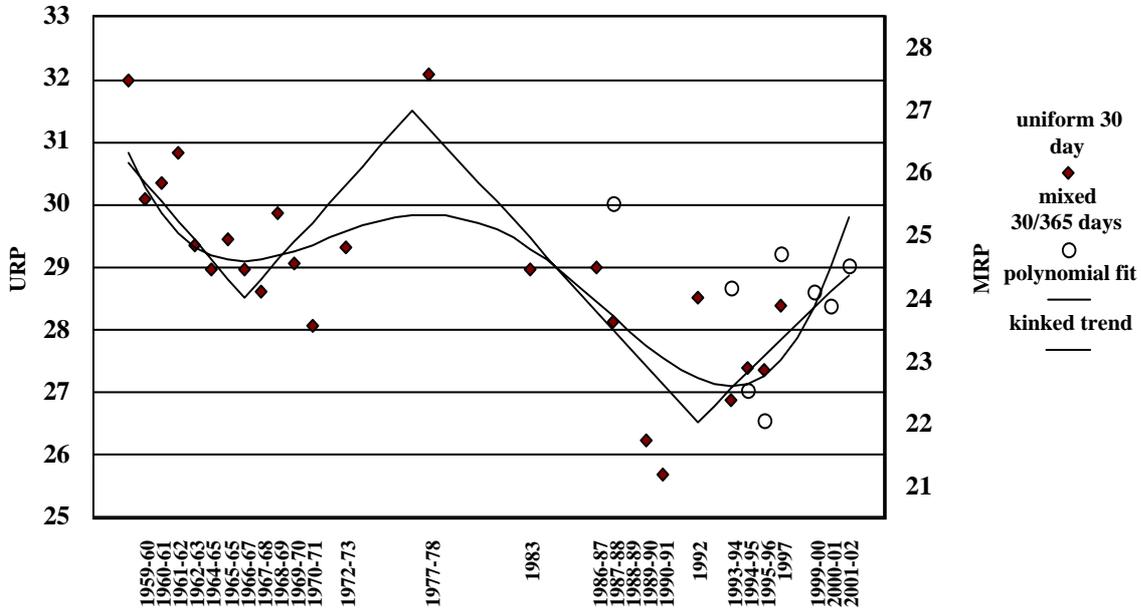


### Chart 10a: Within-State Urban-Rural Disparity

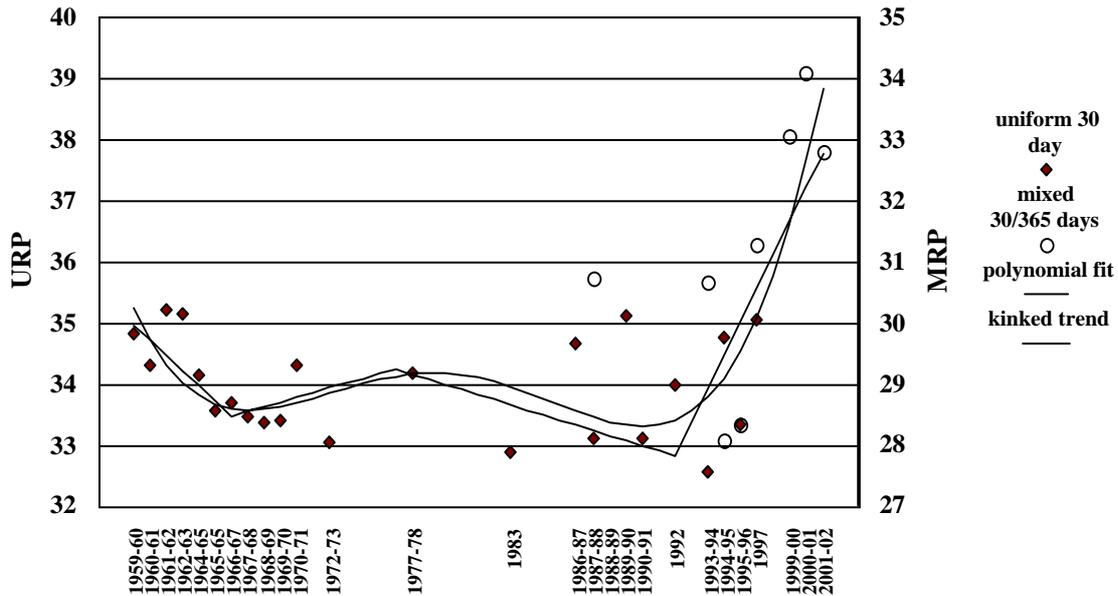
population weighted averages of the ratio of urban to rural nominal mpce



**Chart 10b: Within-State Rural Inequality**  
 population weighted averages of state level ginis



**Chart 10c: Within-State Urban Inequality**  
 population weighted averages of state level ginis



Moreover, as the earlier discussion at level of NSS regions showed, evidence of 1990s increase in inter-state inequality should not detract from inequality within States. In fact, even after the large increase in inter-state inequality during the 1990s, inter-state variance accounted for only 15 and 9 percent of the total national variance of logarithms of rural and urban MPCEs obtained from unadjusted 55<sup>th</sup> round unit-level data. Within-State inequality is still the overwhelming component of total inequality in India. Chart 10a plots within-State rural-urban disparity, defined as the population weighted average of state-level ratios of urban to rural MPCE for the 15 major states, for all full-year NSS rounds from 1959-60 to 2000-01. Although increasing throughout, this also accelerated in the 1990s. Charts 10 b & c plot population-weighted averages of state-level Gini indices for rural and urban areas of the major states. As before, URP and MRP are on separate axis and polynomial and kinked trends are included. These show that a period of inequality decline (highly significant in rural India) starting mid-1970s was reversed in the early 1990s. Although the subsequent increase still leaves within-State rural inequality less than in the mid-1970s, within-State urban inequality has increased very massively during the 1990s, probably more than in China. Along with between-State inequalities, these within-State inequalities increase explain why the 1990s were a relatively lost decade for poverty reduction<sup>60</sup>.

## VII. CONCLUSION

The 55<sup>th</sup> round of the NSS was important and controversial. Conducted in 1999-2000, at the end of the 1990s, it was awaited eagerly for information on what had happened to poverty and inequality during this eventful decade. Unfortunately, methodological changes were made in this round, making it non-comparable to previous rounds and its results different from the previous nine NSS rounds. In complete contrast to the picture of severe setback to poverty reduction that had emerged from earlier 1990s NSS surveys, including the previous “thick” sample NSS 50<sup>th</sup> round conducted in 1993-94, unadjusted comparison of the 55<sup>th</sup> with the 50<sup>th</sup> round shows very large poverty reduction: by 10 percentage points of population or about 60 million persons.

It is agreed generally that this magnitude of poverty reduction obtained from the 55<sup>th</sup> round is an overestimate. A large literature has emerged on comparability problems involved. In particular, it is known that the 365 day recall used in this round for low frequency purchases, such as on durables goods and clothing, caused it to measure lower inequality compared to previous rounds, and that presence of 7 day food queries probably measured higher consumption. Some alternative “corrected” 55<sup>th</sup> round poverty counts were presented at two seminars held in 2001 and 2002. All

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<sup>60</sup> Full details of polynomial and kinked trends are available from the authors, but the following may be relevant:

- a) For rounds 43, 50 & 55 data are from this paper. Grouped data are used for rounds 56-57 and 51-53. For the latter, URP are from schedule 1, MRP Ginis from schedule 2 and MRP means hybrid. All other data are from Ozler et.al.
- b) In addition to time variables, two dummies were included: D1 for cases where the 30 day recall was used for the low frequency items and D2 for cases where the 365 day recall was used but where the schedule had also included the 30 day question. In the case of all the fits in charts 9 a, b & c and chart 10a, none of these dummies were found significant and were dropped. These charts are therefore plotted using only a single axis. For both types of trend in charts 10 b&c, both dummies were found significant. For rural areas, the coefficient on D1 was 4.54 and 4.67 for the polynomial and kinked trend equations and that on D2 was 1.73 and 1.99. The corresponding coefficients for urban areas were 4.86, 4.85, 1.95 and 1.98. In these cases, separate URP and MRP axis were used.
- c) In case of charts 9a & c and 10b&c, all four polynomial terms were found significant, but for 9b and 10a only two of these terms were significant. Similarly, all three breaks in the kinked trend were found significant in case of charts 9a & c and 10b, but only two (1976 and 1992) were found significant for chart 9b and only one (1992) was found significant in case of charts 10a& c. In all cases, the break in the 1990s was found statistically significant.

of these revised downward the extent of measured poverty reduction from the 55<sup>th</sup> round and revised measured inequality upward, but the alternatives varied considerably on actual numbers.

The present paper has reviewed all available 55<sup>th</sup> round estimates and reported comparable estimates of poverty and inequality. This exercise relied mainly on recalculation of unit-level NSS data from rounds 43, 50 and 55, making as few assumptions as possible. In particular, 43<sup>rd</sup> and 50<sup>th</sup> round poverty counts and inequality measures were re-estimated with the mixed 30/365 day recall (MRP) used in the 55<sup>th</sup> round, rather than the uniform 30 day recall (URP) used earlier. The only adjustment was to correct 55<sup>th</sup> round estimates of food consumption for “contamination” from presence of 7-day questions. This food adjustment, based on the abridged consumption schedule of the 55<sup>th</sup> round Employment-Unemployment Survey and nearby trends, is *minimal* and within the margin expected simply on account of the fact that no instructions were issued to even ask 30 day food questions before the 7 day ones till six weeks after the 55<sup>th</sup> round survey had began.

Comparison of these food adjusted 55<sup>th</sup> round counts with the 50<sup>th</sup> round MRP shows that although poverty ratios did probably decline, this was by *at most* 3 percentage points (less than between rounds 43 and 50) and the absolute number of poor did not reduce. This result, which implies that the 1990s were a relatively lost decade for poverty reduction not only corroborates previous NSS rounds it corresponds to the gut feeling expressed by many at the seminars referred to above and to the consensus before the 55<sup>th</sup> round. However, the result does contradict a different consensus that emerged from work by Deaton and Sundaram-Tendulkar: that although the 55<sup>th</sup> round overestimated poverty decline, the number of poor did decline, by at least 30 million.

This is not just an intellectual matter. Poverty counts influence fiscal allocation, determine inter-state distribution of anti-poverty funds, and fix the number of households entitled to Below Poverty Line benefits (access to food subsidy, anti-poverty schemes, and increasingly to subsidised health care and education). All of these are under review and identification has begun of those entitled to targeted benefits. A mistaken consensus on Deaton-Sundaram-Tendulkar counts could cause withdrawal of entitlements from more existing beneficiaries than the entire population of Iraq. This may be the human cost of what had originated as sustained attacks on the earlier 1990s NSS rounds that had dissatisfied those who believed “reforms” would reduce poverty quickly, and which persist, despite Deaton and Dreze (2002) reporting “we have not been able to identify any ‘smoking gun’ that would point to a specific problem with any of these rounds”.

It needs to be clarified in this context that the focus of the present paper has been comparability and consistency of NSS data, not their validity. The objective was to assess what can be concluded post-55<sup>th</sup> round from NSS data about 1990s poverty change, not whether existing poverty estimates from previous NSS rounds were correct. Some conclusions on larger issues of poverty norms and measurement do emerge and are mentioned below. But the important point is that not only were all methodological changes in the 55<sup>th</sup> round, made following earlier criticism of NSS, systematically in the direction of measuring reduced poverty, Sundaram-Tendulkar and Deaton-Dreze failed to gauge the true magnitude of this, in part because they ignored nearby “thin” NSS rounds rather than use these to calibrate and critically assess their adjusted estimates.

As far as Sundaram and Tendulkar are concerned, the only conceptual difference between their method and that followed here is the correction for 55<sup>th</sup> round “contamination” from 7 day food questions. However, given the minimal food adjustment made here, this explains only a minor part of the difference in poverty results. The major difference was due to an inadvertent error in their calculation of 50<sup>th</sup> round 30/365 day counts, which they have since acknowledged and corrected.

Poverty reduction between 1993-94 and 1999-00 is more than halved compared to official claims with this correction alone.

The conceptual difference with Deaton is more substantial. He used the 55<sup>th</sup> round's retention of only 30day questions for some non-food items, assuming a stable relationship between spending on these and the probability of being poor. Since this reported less poverty reduction than S-T's original estimates, correcting not only for 365/30day differences on low frequency purchases but also apparently for 7 day questions on food, this looked more credible. However, on S-T revising their estimates, Deaton's original estimates become incongruous since these imply that the 7day questions on food in the 55<sup>th</sup> round *increased* measured poverty. It turns out that shifts in consumption patterns invalidated a basic assumption of his method and, as Deaton has now acknowledged, led to "corrected" estimates of food consumption *higher* than uncorrected. Since his prior was that presence of 7day queries had inflated measured food consumption, these results must be deemed to be on the wrong side of credibility. Nonetheless, this method confirms that switch to 365day recall for clothing etc. reduced measured inequality very significantly. Moreover, slightly modified treating some food items as unaffected by recall change, the method gives all-India counts very close to those used here, though with State-level differences.

In contrast to these two adjustments, flaws in which have largely been reconciled with proper calculation and consistent estimation, two other adjustments conform more closely to the food adjusted counts reported in this paper: Datt, Kozel and Ravallion, who used current macroeconomic data in an econometric model relating poverty to growth, inflation and public expenditure, and Kijima and Lanjouw, who put 55<sup>th</sup> round household characteristics into a parametric model relating these to poverty. Like Deaton, these derive 55<sup>th</sup> round counts assuming some stable relationship from the past. However, not only do these use much less of 55<sup>th</sup> round information than the food adjusted comparisons used here, and require much stronger assumptions, these do not allow direct analysis of inequality change. Moreover, although the all-India poverty change from these is close to the food-adjusted counts, there are significant differences at the State level.

This paper has examined available data not only for States but also at the level of NSS regions. Some widely known facts, e.g. higher growth in urban than rural areas and in Southern and Western States than elsewhere, are reflected in the adjusted NSS data. But more important are that that the number of poor increased in urban areas of more NSS regions than rural despite much faster growth of urban MPCE, and that almost every State had both regions where poverty increased and others where this declined. Poverty numbers were found sensitive to patterns of inequality increase and demographic change, muting the link between growth and poverty reduction. Apart from low growth in many already poor rural regions and limited mobility from these, the other disturbing feature is that although urban growth was much higher than in the past, not only was this associated with increased within-urban inequality but also many urban areas failed to offer either linkage to their rural hinterlands or escape for the rural poor.

These broad patterns, and evidence that poverty reduction was held back by inequality increase, emerge not only from differently adjusted 55<sup>th</sup> round data but also from nearby NSS rounds. However, it is difficult to analyse regional change fully because 55<sup>th</sup> round methodological changes affected measured inequality and poverty differently across regions. A conclusion of this paper is that although adjusted 55<sup>th</sup> round results are quite robust at the all-India level, this translates less clearly to the States. Although only for Assam is it possible to be certain that the poverty ratio increased between rounds 50 and 55, an increase in absolute number of the poor cannot be ruled out for any major State if all alternative estimates are considered, including from

the consumption schedule of the 55<sup>th</sup> round Employment-Unemployment Survey. Consequently, this round remains inadequate for policy, e.g. inter-State allocation of poverty alleviation outlay.

But, notwithstanding this, another conclusion is that, if adjusted properly, All-India data from round 55 onwards agree reasonably with previous 1990s NSS rounds. Given this, a big picture appears quite unambiguously: that the 1990s were the first post-independence decade when economic inequality increased sharply in all its dimensions. Long period time series presented here show that inequalities had increased in the initial decade of the “green revolution” also. But, with urban gaps reducing, inequality increase in that period was largely confined to rural areas. Moreover, this was accompanied by a tendency for relative food prices to fall and was followed after the mid-1970s by a period of about one and a half decades when rural inequalities declined. This, and better growth after mid-1970s, caused poverty to fall almost throughout from then to 1990 when growth spluttered and food prices rose sharply during a payments crisis. It is not surprising that poverty increased then. But, importantly, poverty reduction appears to have faltered during the subsequent growth revival because every distributional indicator has since worsened.

As far as this big picture is concerned, the 55<sup>th</sup> round is only one point in the charts presented here, and matters only on the nature of recovery from crisis and poverty increase in the early 1990s. Since this and later rounds do show growth revived, the issue is distribution. Unanimity exists on inequality increase between States, across urban-rural and through food prices. And, although shift to MRP from 55<sup>th</sup> round onwards masks within-States inequality, most adjustments agree on inequality increase in urban areas and on failure of earlier equalising rural trends to continue. Such inequality increase may not be unusual post-“reform”, e.g. China, but high initial poverty and population growth seem to have ensured that India’s growth revival after 1992 has largely bypassed the poor. The relatively rich did gain, and some States did perform better than others. But, if NSS data and official poverty lines are accepted, there is little doubt that the 1990s saw increase in the number of poor in many of India’s more populated regions. This is consistent with evidence, e.g. on wage rates, which others have cited to underplay distribution and to argue that only growth matters. However, there is some uncertainty on the exact impact, especially regarding deflators.

Another important finding is of a large 1990s shift in spending from food to non-food (e.g. fuel, medicines and conveyance) even among the poor. This affected Deaton’s adjustment, and means that disjuncture between income poverty and nutrition intake has widened, so that trends in income poverty understate the worsening in the nutrition situation<sup>61</sup>. There is thus no warrant at all to make the apparent fall in poverty numbers from unadjusted 55<sup>th</sup> round an excuse to cut the number of those entitled to subsidised food. The Expert Group on Identification of Households Below Poverty Line (BPL), 2002, recommended a new Census but has stipulated that the number of BPL households identified in any State should not exceed by more than 10 percent the Planning Commission estimates based on the 55<sup>th</sup> round<sup>62</sup>. With this arbitrary 10 percent revision, the

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<sup>61</sup> According to the FAO’s *State of Food Insecurity in the World - 2003*, the number of undernourished people in India went up by 19 million between 1995-97 and 1999-2001. These are, however, based on food balance sheets that return at least 10 per cent higher calorie intake than NSS, entirely on account of non-cereals, and could also mislead on changes over time since data on private stocks is poor. On an assessment that reviews both food balance sheet and NSS data and concludes that nutritional intake did worsen during the 1990s, see *Report of the High Level Committee on Long-term Grain Policy*, Ministry of Consumer Affairs, Food and Public Distribution, Government of India, 2002.

<sup>62</sup> The Census recommended by this Expert Group was to collect data from all households on 13 indicators such as their education, health and migration status, indebtedness, possession of consumer durables, landholding, housing, food security, water supply and sanitation. Selection of Below Poverty Line (BPL) households will be based on the average rank score of each household across these 13 indicators subject to ceiling on total number of BPL households

national poverty count is almost exactly Deaton's adjusted estimate and, as stated earlier, could cut the number of beneficiaries by at least 30 million. To justify denial to so many based on what this paper has established is an incorrect estimate of reduction in the number of income poor (let alone of the nutrition deprived) would be travesty, not only of social justice but of truth as well. This also raises issues of how to match poverty estimates from the NSS with beneficiary selection<sup>63</sup>.

However, although no less painful for the excluded, those contemplating cut in BPL numbers for fiscal or other reasons would be closer to at least some versions of truth if they justify this not by exaggerating poverty reduction but by the argument that poverty numbers from 50<sup>th</sup> and earlier rounds may have been fixed too high. After all, claims that the NSS exaggerated poverty have been voiced using NAS-NSS comparisons ever since the Expert Group on Estimation of Proportion and Number of Poor (1993) ended the practice of applying the NSS distribution to NAS mean expenditure. Also, had they had been used, Deaton's alternative poverty lines would have cut the 1993-94 number of poor by 60 million. Similarly, poverty by the 30/365 day mixed recall was already almost 50 million less in the 50<sup>th</sup> round than by the uniform 30 day recall.

But none of the above is uncontested, and it is not just measurement but also norms that are at issue. For example, it is not proper if poverty is to be kept anchored to a nutrition norm to use the 30/365 day recall without revisiting Engel curves to fix new poverty lines<sup>64</sup>. But doing so now would require confronting that nutrition poverty on existing norms has increased to well over twice income poverty<sup>65</sup>. Any new Expert Group will clearly have its hands full, especially since poverty numbers are very sensitive to even small changes in poverty lines and measured inequality. Results presented here on how poverty counts change from 30 to 365 day recall for low-frequency items, and on sensitivity to presence or absence of 30 day questions, should also be salutary against belief that possible underestimation in NSS can be set right merely by distribution-neutral adjustments. In any case, the evidence refutes strongly a basic assumption of those who argue for anchoring poverty estimates to the NAS: that distributional changes are small and slow<sup>66</sup>.

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obtained from the Planning Commission's poverty counts using NSS. Hirway (2003) has criticised this, pointing out that "there is no logic in reducing the estimates of poverty of one kind to match the other kind of poverty!"

<sup>63</sup> This raises issues well beyond the scope of this paper, including the very large ones of whether NSS consumption expenditure surveys should at all be used to measure poverty and whether targeting if at all should aim at binary identification of poor and non-poor. But one relevant point does emerge from the previous discussion. If poverty counts from NSS are to be used to set a ceiling and actual identification done on basis of household characteristics including health and education status and durables possession, it may be better to define poverty from NSS without including expenditure on durables, education or medical care and to set state-wise ceilings specific to broad household characteristic. Much of the uncertainty stemming from URP-MRP difference would be reduced, and the effect of sampling errors in NSS poverty counts can also be minimised using the Population Census, which does provide information on the population distribution of many of these household characteristics.

<sup>64</sup> The evidence from all the rounds where both the 30 and 365 day reference period were used for low frequency items such as clothing etc. is that shift to MRP increases total MPCE by 5 to 8 percent (for the national distribution) in the neighbourhood of the current poverty line. Since this reference period choice does not affect food consumption, poverty lines for MRP consistent with existing nutrition norms must also be 5 to 8 percent higher.

<sup>65</sup> See NSS Report No. 471 and Meenakshi and Vishwanathan (2003). Given evidence of Engel shifts, two opposite arguments are possible on this separate matter of the nutrition norm. Either, that existing norms remain valid and poverty lines need to be revised upward since these do not correspond to norm nutrition with changed patterns of consumption. Or, that the consumption shifts reflect lower calorie requirement as result of better infrastructure or diet quality and that norms can be revised down to take this into account. Some support for this comes from Radhakrishna and Ravi (2003) who show using National Nutrition Monitoring Bureau and National Family Health Survey data that, despite lower calorie intake, there was some reduction in the anthropometric incidence of child malnutrition during the 1990s in all States except Rajasthan, Uttar Pradesh and possibly Madhya Pradesh, Orissa and Gujarat.

<sup>66</sup> Banerjee and Piketty (2003) provide independent evidence from income tax data that inequality at the top of the distribution, i.e. income shares of the top percentile and above (that had decreased earlier), increased very sharply

Finally, the much-maligned National Sample Survey Organisation (NSSO) emerges rather well, at least compared to its users. That the present analysis was at all possible is because changes were preceded by experiments whose results are almost entirely in the public domain. That, after all, some comparability is possible and the 55<sup>th</sup> round turns out to correspond fairly well with nearby rounds is testimony to integrity of NSS field operations in face of fairly severe shocks. Further work is of course necessary, especially on sampling biases and on improving response of the relatively rich, e.g. by reducing questionnaire size. Also, in the absence of direct control for these in any NSS round, some ambiguity remains on how simultaneous presence of two recalls affect each other. But the NSSO comes out relatively unscathed even on this: 55<sup>th</sup> round “contamination” from 7 day queries to 30 day food estimates could well have been as small as assumed here and, if anything, 365 day estimates of low frequency items improve if 30 day queries are also present.

It is now by and large quite well known how different reference periods affect estimates; and, as this paper demonstrates, linkage factors can be obtained, with minimum arbitrary assumptions, from earlier thick rounds that used both URP and MRP and from the type 1 and type 2 schedules of rounds 51 to 54. Some in-survey calibration is necessary to eliminate differences that remain on how to adjust the 55<sup>th</sup> round. But, with the NSS having concluded a proper test of suitability of different recalls for different food items through a pilot survey, in-survey calibration of remaining ambiguities on exact linkage between earlier NSS rounds and rounds 55 to present are also probably best left to experimental pilot surveys. The overwhelming priority now is to restore credibility of NSS time series and to close the entire issue of reference periods.

The strength of the NSS was consistency of its survey design and uniformity of the concepts used. Given sensitivity of poverty numbers to even very small changes, experimentation confuses in surveys whose purpose is poverty monitoring. It is too early to tell whether past criticism of NSS and subsequent experiments will improve future estimates. Sadly for statistics, the 55<sup>th</sup> round also became opportunity, seized by a coalition of the willing, to degrade earlier 1990s NSS rounds just because these had revealed a poverty setback. This paper has reviewed the resulting literature. However, longer-run credibility of the statistical system requires consensus on a definite transition to an agreed set of reference periods in the next “thick” round. This would be best accomplished by having two schedules canvassed separately, one which uses whatever is considered a preferred recall structure for consistent use into at least the medium-term future and the other which uses the exact 50<sup>th</sup> round reference periods and is implemented on an independent and interpenetrating sample, large enough to provide linkage factors accurate at least to deciles level by States.

This need to agree on a stable survey design for the medium term future and to simultaneously benchmark against past data, not only on consumption levels but also and more importantly on their distribution, is vital. The interpretation of 1990s NSS trends offered here differs significantly from what others have concluded from the same data. It is not just economic analysis that is affected critically by whether or not the Indian economy has been able to buck the trend in China and elsewhere by “reforming” without large inequality increase. A huge gap exists today between what policy makers often state in Washington, Delhi or even many State capitals and grass-roots perception among social workers and activists or as becomes evident during elections. It may of course be that governance in this era of globalisation requires hype to “feel good”. But unless the still excellent NSS Consumer Expenditure Surveys regain sufficient agreement among analysts for

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between 1983 and 1987 and again after 1992. They show that, if these very rich were not captured adequately by NSS, their increased share alone can explain 20 to 40 percent of enlarging NAS-NSS differences. This is in addition to inequality increases discussed here, i.e. those captured by the NSS itself, and disregards possible NAS overestimation.

them to be able to inform truthfully on serious issues of distribution and thus bridge gaps in perception, these will be of little or no practical value.

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