Recounting the Poor: Poverty in India 1983-1999

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Introduction

The official source of information on poverty in India is the consumer expenditure survey undertaken by the National Sample Survey (NSS) organization. It has conducted such surveys for almost fifty years. Though annual surveys have been conducted in recent years, most analysis and debate has centered on the large survey, incorporating more than 100,000 households, which the NSS undertakes every five years. Since 1983, two such surveys have been conducted: the consumer expenditure survey (CES) and the Employment and Unemployment (E&U) survey. These have been conducted simultaneously, covering the *same* set of households for the survey years 1983, 1987-88, 1993-1994,[1] but different households for the year 1999-2000. This paper is about the inferences one can make about the magnitude of and trends in poverty in India, on the basis of *unit* records made available by these eight household surveys since 1983.

What is the value-added of further research purporting to estimate poverty, when an official government agency has already undertaken this task? There are two major reasons why extra research into the basic topic of "What is the magnitude of poverty in India" is worthwhile. First, for some years now, and certainly since the late seventies, the national sample surveys on which official poverty estimates are now based, are capturing less and less of consumption as revealed by the National Accounts (NA). Second, for the latest survey year, 1999-2000, the survey authorities posed the *same* food expenditure questions to the *same* households, asking them to recall their estimates for both a 7 and a 30 day reference period.(In previous years, NSS surveys had only used a 30 day recall period). Thus, the possibility exists that the total 30 day recall based food expenditure results could have been influenced by the expenditure reported for the 7 day reporting period; and that the "bias" was likely to be upwards since typically a lower recall period for food results in higher reported mean expenditures. Since food is a large proportion of expenditures, there is therefore the theoretical possibility that estimates of the "contaminated" 30 day recall period for 1999 cannot be used for inferring trends from the earlier years.

However, as argued in this paper, while some bias is admittedly present in the 1999-2000 survey due to its use of mixed reference period, the magnitude of this bias is likely to be small, especially in comparison to other mis-measurement caused by use of

survey data. This is underlined by the growing divergence between NSS- and NAS-based estimates of per capita consumption. Today, the NSS surveys are capturing about 20 to 30 percent *less* of aggregate consumption as revealed by the NAS, than they did just fifteen years ago. If this mis-measurement also affects estimates of the consumption of the poor and thus the calculation of the head-count ratio, then it far outweighs a few percentage points error in mean consumption caused by the 7/30 day problem. It is therefore necessary to devise a method for "correctly" estimating mean consumption in 1999-2000, and if need be, for other survey years. To this end, this paper offers an *NSS* non expenditure survey-based method of arriving at a valid estimate of mean consumption that neither relies on the use of national accounts information[2] nor on the problematical consumer expenditure survey of 1999-2000.

The need for such an alternative estimate is especially evident in light of the fact that poverty estimates, despite their simplicity, are the most contentious of all Indian statistics. Many public policies and perhaps even political fortunes hinge on these estimates. If the head-count ratio (HCR) of a state - or the country - goes down, it is considered to be doing well, and its policies are deemed deserving of praise and emulation. (On the other hand, if the HCR rises, the country/states may ask for more funding to fight poverty!) Accordingly, economists and statisticians who use these data, as well as the survey agencies that collect and process them, find themselves at the center of contentious discussions about poverty trends, and the correctness of associated economic policies.

The plan of this paper is as follows. Section 2 summarizes the controversy over the magnitude of Indian poverty. Section 3 discusses the trends in the survey capture ratio, i.e. the ratio of what household surveys indicate is the level of per capita consumption, to that corresponding estimate provided by an alternative source, such as the national accounts. Section 4 discusses the possible sources and magnitude of errors contained in both the households surveys and national accounts. Section 5 estimates poverty in India in 1999-2000 according to different methods, emphasizing in particular a method which uses information about increases in NSS household survey-measured real wages between 1983 and 1999. As noted above, the former is the year of an

[1] For an analysis of this unusual property of the surveys, see Bhalla(2002e).
[2] A framework to analyze poverty using both survey and national accounts information is developed in Bhalla(2000, 2002d).

"uncontaminated" survey and the latter is that of a problematical expenditure survey – in neither year was the NSS survey containing wage information "contaminated". This section also concludes, arguing in particular that in light of data from the national sample surveys, it is almost incontrovertible that poverty in India was less than 15 percent in 1999-2000. Notably, this number is some conceptual distance away from the corresponding 35 to 40 percent World Bank estimate for the same year, and is nearly half of the official government of India estimate of 26 percent. The term incontrovertible is not used lightly. If certain universal assumptions, made by all economists, political scientists and sociologists, are also made about the relationship between wages, income and consumption, then it *has* to follow that poverty in India in the late nineties was in the teens. Other alternative estimates may of course be posited. As argued however, these are accordingly also plagued by severe, so-called "smell test"[3] problems.

Section 2: **The Debate over Poverty in India**

Over a thirty year period lasting until the early eighties, there was not much per capita income growth in India, and not surprisingly, not much reduction in poverty.[5] Indeed, there was almost no improvement in the head count ratio during this time; it was 45 percent in 1951-52, 45.3 percent in 1960-61, 52.9 percent in 1970-71, and 43 percent in 1983. [6] When Ahluwalia-Carter-Chenery(1979) constructed the first international poverty line, they based it on the 45th percentile of the Indian distribution.[7] This 45 percent estimate of poverty is virtually identical to the official Indian poverty estimate for 1983, based on the NSS expenditure survey for that year.

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[3] Smell tests and duck tests are offered in Bhalla(2002d) to differentiate between alternative claims about reality – e.g. if it stinks, it cannot be a rose.

[5] Poverty is correctly defined, and measured, in terms of per-capita consumption. This is also the practice in this paper. However, while discussing primarily trends in consumption poverty it uses the terms income and consumption interchangeably, on the basis that there cannot be consumption growth without income growth. It should be noted however that poverty is of course not defined in terms of income alone; it also comprises consumption of social services such as education and health services. For discussion of international trends in living standards, see Bhalla(2002y) and Asian Development Bank (2002).

[6] Estimates from World Bank(1997), p.149.

[7] That this Indian poverty line is equivalent to the famous PPP one dollar-a-day poverty line is documented in Bhalla(2002d).

However, India changed in the early eighties. It was mysterious perhaps, but the fact remains that per capita income growth accelerated from about 1 percent per annum to above 3 percent per annum. This new trend has persisted for the two decades and all estimates and analysts agree that per capita consumption in India, as measured by national accounts, is at least fifty percent higher in 1999-2000 than it was in 1983. This increase is based on a lower bound estimate of per-capita consumption growth of 2.5 percent per annum.

So how large a decline in poverty should result from a fifty percent rise in consumption, assuming that the consumption distribution stayed the same?[8] Theoretical estimates of the elasticity of poverty reduction with respect to growth - referred to as the head-count elasticity - have been estimated by various authors.[9] This elasticity has been estimated to be about –1.3 for India (Ravallion-Datt 1996) and about -2 for developing countries (see Collier-Dollar). Given an Indian poverty level of 45 percent in 1983 and fifty percent growth in per capita consumption, the elasticity estimate of –1.3 yields a predicted head-count ratio of 23 percent in 1999-2000.

Using unit-level data for India covering the years 1983, 1987, 1993 and 1999, and disaggregating each state and its distribution into rural and urban components, the mean survey-based growth between 1983 and 1999 is observed to be 26.2 percent, and the elasticity of poverty reduction is –2.4. This elasticity is derived from a regression whose dependent variable is the log change in the poverty ratio, and whose independent variable is the log growth in surveyed real per capita expenditures. In total, there are 105 state-level urban/rural observations of changes in growth and poverty for 1987, 1993-1994 and 1999-2000. On the basis of this growth rate and elasticity, the predicted poverty level in 1999 is 24 percent. If the elasticity were –1.33, the predicted 1999 poverty level would be 31.8 percent.

As discussed in World Bank(1991), Bhalla(2000a) and Bhalla(2002d), there are severe problems with the above method of deriving the elasticity, and in its use in forecasting or estimating levels of poverty. Changes in the head-count ratio are critically dependent on the position of the poverty line and its interaction with the distribution of

[8] In fact, as shown later in the paper (Table 5), the distribution of consumption in India *improved* between 1983-1999.
[9] See Kakwani(2000), Ravallion-Datt(1997) for a sampling.

consumption[10]. This can be illustrated by the following simple example. Assume the poverty line is Rs. 100 and all the poor have income of Rs. 99. A one percent growth in incomes of the poor will lead to zero poverty – ian infinite elasticity of poverty reduction with respect to growth. Now assume all the poor are clustered at Rs. 50, and the poverty line remains at 100. Obviously, even a sixty percent growth in the incomes of the poor will lead to a zero reduction in the HCR – a zero elasticity.

Obviously, reality is not as extreme as this. However, by not adjusting *at all* for the interaction between the poverty line and the distribution, many researchers have led themselves to conclude erroneously that the growth-poverty elasticity has been low, and hence, that it is imperative to increase this elasticity, e.g. by achieving a better distribution of income. To evaluate such concerns, Bhalla(2002d) introduces the concept of the "shape of distribution elasticity (SDE)." This is defined as the amount by which the HCR will decline for a given amount of growth, assuming that there is no change in the distribution. This "elasticity" has to be estimated in a non-linear manner, by shocking the Lorenz curve with small changes (+/- 2.5 percent) at the poverty line. As developed in Bhalla(2002d), the SDE can help translate income and inequality changes into expected changes in poverty, via the following formula:

(1) $$dP = (g + i)*SDE$$

where dP is the arithmetic change in the head-count ratio of poverty, g is the (log) growth in *average* per capita consumption, and I is the (log) change in the share of consumption of the poor *at or near the poverty line*.[11] The above equation is *exact*, and

[10] This point was first made in a World Bank study on Malaysia (World Bank 1991), and subsequently in Bhalla (2000a,2000b). The World Bank report was published in Jan. 1991, but the work had been completed more than a year earlier. The report stated: "Choice of a poverty line dictates the initial level of absolute poverty, which has an important bearing on subsequent achievements…Since poverty is defined in terms of a simple head-count measure (incomes above or below a fixed income) the decline is dependent on the defined poverty line…If there are many people slightly below the poverty line initially, then a relatively small amount of growth can have a large effect on reducing poverty" (82). The World Bank's World Development Report for 1990 articulates similar conclusions: "For any given increase in the incomes of the poor, the reduction in poverty depends on where the poor are in relation to the poverty line. If they are concentrated just below the line, the increase in their incomes will have a bigger effect on poverty than if they are spread more evenly" (47). Prior to the publication of these "findings", the poverty literature did not contend with this effect. Since then, it has been "well known," but to wit, many pro-poor growth analysts have not to date incorporated it into their analyses.

[11] The reason Ravallion-Datt have a "residual" term is because they *define* the arithmetic change in poverty to be equal to a growth component plus a redistribution component plus a residual equal to the "difference between the growth (redistribution) components evaluated at the

has no room for a "residual" term as argued by Ravallion-Datt(1991). For non-small changes, the relationship does not hold exactly, for the simple reason that the large changes in income most likely traverse a large portion of the Lorenz curve and the arc elasticity estimated by SDE is an average of several 'arcs". However, as results for several Indian states show (Table 1) , the approximation for large changes provided by equation (1) is reasonably close.

Table 1 presents SDE results for several states in India, outlining respective changes in their poverty rates over the sixteen year period, 1983-1999. Results are presented for rural and urban areas, and are also provided as pooled data for each state. A perusal of these results suggests the following:

1. The "model" outlined by equation 1 is an excellent predictor of changes in poverty. Notably however, the model does *not* incorporate the "initial inequality" effect on poverty reduction, as argued by Ravallion(2000a), World Bank(2000) etc. There is no theoretical reason for initial inequality to affect poverty reduction since the inequality that matters is that observed *at or near* the poverty line. And given a fixed poverty line, such inequality is constantly in flux when there is economic growth.
2. There have been large changes towards equality observed in most parts of rural India (15 out of 16 states) and to a lesser degree in urban India (8 out of 17 states). On an all-India basis, the share of the poor (defined according to the head-count ratio in 1983) in the overall consumption distribution *increased in 14 out of the 17 states based on NSS data.* This overwhelming evidence suggests that the claim that inequality has worsened in India over the last two decades is somewhat erroneous.

The impact that a variation in the magnitude of SDE has on poverty reduction is underlined by the results in Table 1. For rural Assam, the SDE is a high 1.3 in 1983; for urban Maharashtra, it is a low 0.6 in the same year. Thus, the theoretical, empirical and policy related consequences of deriving the head-count elasticity *without* accounting for the variation and/or magnitude in the SDE are enormous. By example, Ravallion-

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terminal and initial Lorenz curves (mean incomes) respectively" (p. 4-5). As documented in Bhalla(2002d), the derivation of equation 1 is based on *changes* from an initial point (year), and

Datt contend that the growth-poverty elasticity for Bihar is low, and that for Kerala is high, noting that "for the headcount index, the elasticities vary from a low of 0.25 in Bihar to a high of 1.23 in both Kerala and West Bengal' (15). They then proceed to calculate different growth-poverty scenarios based on these estimated elasticities.

However, these elasticities are faulty. The SDE for India has stayed close to 0.8 for the last twenty years; for Kerala, it was 0.70 in 1983, and today, it is 0.57. This means that Kerala today would need about a 20 percent higher growth to achieve the *same* amount of poverty reduction as in the early 80's. By contrast, Bihar had an SDE of 0.9 in 1983 and 1.16 in 1999. Accordingly, a 20 percent *lower* rate growth would be sufficient for Bihar to achieve the same amount of poverty reduction as previously. These predictions are diametrically opposite to the assertion of Ravallion-Datt.

Indeed, it is generally the case that if the impact of growth is assessed via the "mediation" of SDE, then the correct growth-poverty elasticity is often 50 to 100 percent larger than one which has been conventionally estimated.[12] For instance, in the case of Indian states, this elasticity is estimated to be -3.0, rather than –2.4. On an average basis, the "improvement" from 2.4 to 3 reflects the fact that adjusted by an SDE of approximately 0.8, the "net" impact of growth on poverty reduction is 3*.8 = 2.4.

However, as shown above, SDE's can and do vary enormously, so an estimate of the correct elasticity is critical. For example, in the next few years it might be the case that the SDE declines from 0.8 to 0.6. A 10 percent rate of growth would accordingly lead to a six percentage point decline in the HCR (10 percent multiplied by 0.6), rather than an 8 percentage point decline, as would have been the case previously. If one does not take into account SDE, one would therefore be led to conclude erroneously that the importance of growth in decreasing poverty has severely diminished in India. And some might even attribute this purely statistical decline to economic reforms!

Besides adjustment for SDE, a *second* serious conceptual error besets traditional estimates of the growth poverty relationship. It has been variously termed the Peter-Paul problem by Bhalla(2000b,2002d), and the Indian-Chinese problem by

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the consumption growth and distribution from this initial point. The question of a "terminal" year distribution does not arise.

[12] See Bhalla 2002d, for details of estimates for different countries and time-periods.

Deaton(2001a). The error is one of using changes in real per capita consumption based on *national accounts* as an estimate of *survey*-based consumption growth, and using survey-based consumption growth for deriving the poverty estimates.

Table 1a: Growth-Inequality-Poverty Connections: Rural India, 1983-1999

State	Gini		Change in Gini (1983-99)	Change in Inequality (1983-99)	Growth in per capita cons. (1983-99)	Total growth (1983-99)	SDE	Change in HCR		HCR	HCR
								Predicted (1983-99)	Actual (1983-99)		
	1983	1999					1983			1983	1999
Andhra Pradesh	29.7	23.8	-22.1	14.6	9.0	23.6	0.80	-19.0	-16.2	27.3	11.0
Assam	20	20.3	1.5	-2.5	1.9	-0.6	1.30	0.9	-3.9	44.3	40.4
Bihar	26.2	20.8	-23.1	7.1	18.6	25.7	0.80	-20.4	-20.9	65.3	44.4
Gujarat	26.6	23.8	-11.1	4.3	17.8	22.1	0.85	-18.9	-16.9	29.3	12.5
Haryana	28.4	24.9	-13.2	7.3	17.5	24.8	0.83	-20.5	-14.0	21.5	7.4
Himachal Pradesh	27.2	24.5	-10.5	10.0	12.1	22.1	0.67	-14.9	-10.3	18.4	8.0
Karnataka	30.9	24.4	-23.6	16.7	13.2	29.9	0.79	-23.7	-19.1	36.3	17.2
Kerala	31.9	28.9	-9.9	7.6	37.0	44.6	0.88	-39.3	-30.7	40.1	9.4
Madhya Pradesh	29.7	25.4	-15.6	10.1	6.9	17.0	0.85	-14.4	-12.8	50.3	37.4
Maharashtra	29.1	26.2	-10.5	5.6	22.1	27.7	0.87	-24.0	-22.9	46.3	23.4
Orissa	27.1	24.7	-9.3	3.2	22.8	26.0	0.82	-21.2	-20.0	68.5	48.4
Punjab	28.8	25.3	-13.0	13.7	6.7	20.4	0.48	-9.8	-7.9	14.1	6.2
Rajasthan	34.6	21.3	-48.5	31.8	1.6	33.4	0.74	-24.7	-20.9	34.3	13.4
Tamil Nadu	36.6	28.4	-25.4	15.4	30.1	45.5	0.79	-35.9	-34.1	54.4	20.4
Uttar Pradesh	29.1	24.9	-15.6	8.1	11.9	20.0	0.85	-17.1	-16.0	47.4	31.4
West Bengal	29.9	22.6	-28.0	14.3	26.2	40.5	0.78	-31.6	-32.8	64.3	31.5
India	30.4	26.3	-14.5	7.8	18.5	26.3	0.92	-24.2	-20.9	48.2	27.3

Source: Unit record NSS data for 1983 and 1999.

Notes: 1. SDE is the "shape of distribution elasticity" defined as the expected change in poverty for each 1 percent growth assuming the distribution of consumption stayed constant.

2. Inequality change is the (log) change in the consumption share of the poor. This change is computed as the change in share of the bottom 20 percent, if the HCR for the base year 1983, was below 25 percent, or of the bottom 40% if the HCR in 1983 was between 25 and 45 percent, etc.

3. Total growth in incomes is the sum of (log) growth in per capita consumption and log change in inequality.

4. Predicted change in the head-count ratio is given by the product of total growth and SDE; see text.

Table 1b: Growth-Inequality-Poverty Connections: Urban India, 1983-1999

State	Gini		Change in Gini (1983-99)	Change in Inequality (1983-99)	Growth in per capita cons. (1983-99)	Total growth (1983-99)	SDE	Change in HCR		HCR	HCR
	1983	1999					1983	Predicted (1983-99)	Actual (1983-99)	1983	1999
Andhra Pradesh	33.1	31.5	-5.0	1.6	28.8	30.4	0.73	-22.1	-23.7	51.2	27.4
Assam	26.1	32.5	21.9	-13.3	28.9	15.6	0.88	-13.7	-8.6	16.4	7.7
Bihar	30.4	32.3	6.1	-2.9	10.1	7.2	0.76	-5.4	-3.8	38.0	34.2
Gujarat	28.7	29.1	1.4	-2.2	31.6	29.4	1.08	-31.8	-22.3	37.3	15.0
Haryana	38.7	29.1	-28.5		15.6	15.6	0.92		-17.3	27.4	10.1
Himachal Pradesh	44.7	30.7	-37.6	30.0	35.4	65.4	0.42	-27.2	-19.1	22.2	3.1
Karnataka	34.2	32.8	-4.2	4.3	26.4	30.7	0.71	-21.7	-19.1	44.2	25.1
Kerala	40.5	32.6	-21.7	13.4	24.2	37.6	0.64	-24.2	-22.4	42.4	20.0
Madhya Pradesh	30	31.9	6.1	-4.3	21.2	16.9	0.81	-13.7	-15.8	54.3	38.5
Maharashtra	34.6	35.4	2.3	-0.1	-1.6	-1.7	0.60	1.0	0.9	26.3	27.1
Orissa	29.1	29.6	1.7	-0.7	-3.1	-3.8	0.91	3.4	2.3	41.2	43.5
Punjab	35.6	29.4	-19.1	22.6	25.4	48.0	0.56	-26.8	-19.0	24.4	5.4
Rajasthan	33.8	28.5	-17.1	12.6	15.2	27.8	0.78	-21.6	-17.7	37.2	19.5
Tamil Nadu	35.2	38.8	9.7	-5.5	41.2	35.7	0.73	-26.1	-25.7	48.5	22.8
Uttar Pradesh	31.8	33.2	4.3	-3.1	22.6	19.5	0.82	-15.9	-14.2	45.3	31.1
West Bengal	33.5	34.6	3.2	1.8	11.9	13.7	0.75	-10.3	-6.2	21.3	15.0
Delhi	36	36.2	0.6	-2.2	36.9	34.7	0.67	-23.3	-17.8	27.0	9.2
India	33.9	34.7	2.3	-1.8	31.5	29.7	0.76	-22.6	-21.7	45.1	23.4

Table 1c: Growth-Inequality-Poverty Connections: All India, 1983-1999

State	Gini		Change in Gini (1983-99)	Change in Inequality (1983-99)	Growth in per capita cons. (1983-99)	Total growth (1983-99)	SDE	Change in HCR		HCR	HCR
	1983	1999					1983	Predicted (1983-99)	Actual (1983-99)	1983	1999
Andhra Pradesh	31.3	29.8	-4.9	5.8	14.7	20.5	0.80	-16.5	-15.1	35.3	20.2
Assam	21.2	24.5	14.5	-7.1	7.3	0.2	1.17	-0.3	-4.9	41.3	36.5
Bihar	27.8	24.1	-14.3	7.6	18.0	25.6	0.79	-20.3	-17.9	62.1	44.3
Gujarat	28.4	28.6	0.7	-0.9	23.3	22.4	0.87	-19.5	-16.2	33.3	17.1
Haryana	30.6	26.9	-12.9	6.2	17.9	24.1	0.76	-18.3	-14.7	23.5	8.8
Himachal Pradesh	29	27.1	-6.8	8.3	20.1	28.4	0.80	-22.7	-15.0	23.1	8.1
Karnataka	33.2	31.3	-5.9	7.7	18.4	26.1	0.68	-17.7	-15.8	41.1	25.3
Kerala	33.6	30.4	-10.0	6.9	34.0	40.9	0.85	-34.8	-28.1	40.4	12.3
Madhya Pradesh	30.7	29.3	-4.7	3.5	11.3	14.8	0.94	-13.9	-10.2	51.5	41.3
Maharashtra	34.1	35.3	3.5	-2.1	14.4	12.3	0.69	-8.5	-9.0	41.1	32.1
Orissa	28.4	27.8	-2.1	0.7	20.3	21.0	0.85	-17.8	-15.1	65.4	50.3
Punjab	30.3	27.1	-11.2	14.9	12.7	27.6	0.43	-12.0	-11.1	17.2	6.1
Rajasthan	35	24.6	-35.3	27.0	5.2	32.2	0.66	-21.3	-19.7	36.1	16.3
Tamil Nadu	37.1	36.6	-1.4	1.7	36.0	37.7	0.81	-30.6	-26.2	52.4	26.2
Uttar Pradesh	30.2	28.2	-6.9	4.4	14.9	19.3	0.84	-16.3	-15.1	47.4	32.3
West Bengal	32.8	29.8	-9.6	8.1	23.5	31.6	0.78	-24.8	-25.0	54.3	29.3
Delhi	36.2	41.1	12.7	4.7	15.9	20.6	0.65	-13.4	-5.5	11.5	5.9
India	32.5	32	-1.6	1.6	23.6	25.2	0.80	-20.1	-18.9	48.2	29.4

What is happening is the following. Most journalists compare the per capita GDP growth from the national accounts with the change in the head-count ratio, as revealed by household surveys. Only if consumption growth from national accounts is approximately equal to consumption growth from household surveys would there be no error in this attribution. Between 1960 and 1983, per capita consumption growth according to surveys was 431 percent; according to national accounts, 461 percent[13]. Over the last twenty years this previously close correspondence has attenuated. Corresponding to the period 1983-1999, survey consumption grew at 373 percent, which was considerably lower than the 533 percent consumption growth reflected in the national accounts.

What happened? Nothing, except that in the 1960s, surveys were capturing upwards of 90 percent of national accounts; in 1983, the surveys captured approximately 70 to 75 percent, and in 1999 the surveys captured only 56 percent. In other, but equivalent, national account terms, average consumption would have to increase by approximately 30 percent between 1983 and 1999 for one to conclude that there had been absolutely *no* change in the level of average consumption, and therefore no change in the level of Indian poverty! This is an untenable assumption, which yields an untenable conclusion. Therefore, while there is no reason for journalists to change their headline practice of citing NA income growth and survey based change in poverty, there is considerable reason for economists to not commit the same Peter-Paul mistake, i.e. attributing Peter's income to Paul's poverty.

As noted earlier, there is one further problem plaguing the estimation of Indian poverty, pertaining specifically to 1999 - the use of both 7 day and 30 day reference periods in the NSS consumption expenditure survey for that year. For the 1999-2000 surveys, the enumerators asked the same household to recall their consumption for each food item according to a 7 day reference period, as well as a 30 day reference period. The corresponding mean food group estimate for the 7 day period was Rs. 343 per capita per month. For the 30 day recall period, the corresponding estimate was Rs. 323 – i.e. six percent lower. If the 30 day period recall is taken as the "true" estimate, this would imply that surveyed consumption of all items is only 12.4 percent higher in real terms in 1999-2000, than it was six years earlier, in 1993-94. Note that this figure corresponds to the mean estimate of total consumption. However, the national accounts estimate of growth in mean consumption over the same period is 30 percent, i.e. two and a half times the equivalent survey estimate. In reality therefore, the food estimate for 1999 is likely to be higher than Rs.

[13] As discussed later, there is more than one estimate of nominal consumption growth in India! The estimate referred to here pertains to the national accounts base (1960-61 or 1970-71 or 1980-81 or

323 and some distance towards the 7-day estimate of Rs. 343. If the movement is in the other direction, then the survey estimate will be approaching a zero growth estimate in average consumption, and doing so during a time-period when all other estimates suggest a rapid growth in mean consumption and income. Accordingly, it is reasonable to argue that the error in the 30 day recall period is unlikely to be more than a few percentage points, and considerably smaller than the 18 percentage points gap between the survey and national accounts estimate. If this is indeed the case, then the best assessment of poverty levels in India in 1999-2000 can be provided by an assessment of the trends in the survey/national accounts ratio, S/NAS. This is a subject towards which we now turn.

1993-1994) in use at the time of the household survey.

Section 3: **Accuracy of Survey and National Account Means**

The present method of measuring poverty in India entails an assumption that the survey data is approximately correct both with regards to the mean and distribution of consumption. The number of people whose expenditure is registered below a pre-defined poverty line is then counted. This pre-defined line is fixed at Rs. 49.6 and Rs. 56.8 for rural and urban areas respectively, in 1973-74 prices. Individual consumer price deflators, for rural and urban areas respectively, are then used to update the poverty line over time.

There are two sources for the estimate of the mean of the distribution – one available from the surveys, and the other provided by the system of national accounts (NAS). However, the two means are not expected to be exactly equal, because their coverage (by definition) is not identical. For example, NAS means include the consumption of institutional populations, be they prison inmates or non-governmental organizations (NGOs). The *growth* rates of consumption yielded by the two methods, however, should be broadly similar, since it is not expected that the share of the institutional population *and* their mean consumption would increase significantly on a structural basis.

The law of large numbers suggests that the survey mean of per capita expenditures would be approximately equal to the unknown “true” number, X. An *alternate* estimate of X is provided by the national accounts data, which, unlike surveys, provides mean estimates for every year, and every quarter. The NAS uses several pieces of data, (including NSS when available), to obtain annual estimates of total private consumption expenditure. It is worth noting that the law of large numbers applies with much greater force to the national accounts data. Furthermore, accounting checks and balances used in the NAS should smooth out unwarranted spikes and fluctuations in average consumption.

So, how do we evaluate the data reliability and attributes of the national accounts and NSS estimates? There were several articles in the sixties on this topic, and a special volume on poverty, edited by Bardhan-Srinivasan (1974) contains some of the major contributions. At that time, the general conclusion was that the survey and national accounts were moving in parallel, and that the survey capture ratio was close to 95 percent. Thus, it was not surprising that the accepted practice of the government of India was to use the distribution in per-capita expenditures from NSS surveys, and equate the survey mean to the national accounts estimate. Thus, a consistency was achieved, in that the mean survey estimate of per-capita

expenditures was set equal to the mean national accounts estimate. Accordingly all poverty or head-count ratios were derived from this *mean-adjusted* NSS survey data.

However, in 1989, the government of India appointed an Expert Group (EGGOI) to examine the entire set of issues relating to the estimation of poverty in India. This group recommended in its report (GOI 1993), which was accepted by the Planning Commission in 1996, that henceforth the practice of equating the means of the survey and national accounts should be discontinued, and that estimates of poverty should be exclusively based on the NSS survey estimates.

EGGOI did not empirically *substantiate* their conclusion that poverty calculations should henceforth not adjust the survey data with reference to the NAS, a point noted by both Bhalla(2000a) and Deaton(2001). They did note conceptual problems with a uniform multiplier, and that there were problems with the accuracy of the national accounts data. However, the choice between NSS and NAS cannot be settled by noting that NAS contains errors. A useful point of departure in making that choice would have been to note also errors in the NSS survey data. Only if there were considerably *less* errors in NSS, would one prefer not to use the information contained in national accounts. The Expert Group also did not discuss the possibility that NSS data might not be capturing the entire picture. Notably, this was at a time when the survey and national accounts data were beginning to diverge, with the NA yielding a level of consumption at least 25 percent higher than the survey estimate. In other words, just when a reconciliation attempt was needed, the EGGOI decided to altogether ignore the question of the reliability of NSS data .

Given that the NA estimates of per capita consumption are considerably higher than the survey estimates, it is a trivial calculation to show that the old Planning Commission method would yield a considerably lower estimate of the HCR than the new EGGOI method. In Bhalla(2000a), several methods are used to test the EGGOI hypothesis of inaccuracy of the NAS data. The conclusion is that the underlying unknown “true” per capita consumption was likely to be closer to the NAS-based estimate than to the NSS survey estimates. In section 5 of this paper, analysis of NSS wage data also supports this conclusion.

A “reliable” estimate of survey consumption mean is provided by an adjusted NA consumption mean. (see Bhalla(2002d)). The NA means need to be adjusted downward to reflect two considerations; first, that surveys are likely to miss more of the rich than of the

poor, and second, that the degree of under-estimation by the surveyed rich is likely to be higher than the degree of under-estimation of the surveyed poor. The total adjustment that is needed is approximately 15 percent i.e. the NA means need to be reduced by 15 percent (10 percent for the consumption of non-surveyed rich households and 5 percent for the "fact" that the rich understate by a larger degree) to arrive at a reasonable approximation for the survey mean (see next section).

However, Ravallion (2000), closely followed by Sundaram-Tendulkar(2001), have questioned the use of even *adjusted* national accounts means. Ravallion argues that since national accounts data on consumption includes that of NGOs, political parties etc., "replacing the NSS mean with consumption per capita from the NAS when measuring poverty would imply that campaign spending by politicians trying to get elected would automatically reduce measured poverty even if none of the money goes to the poor" (3246).

Sundaram-Tendulkar also recommend in their conclusion against adjustment of NSS data. In contrast to Ravallion, they present some empirical evidence for their conclusion, noting that " our analysis at a disaggregated level across broad items of expenditure and across fractile groups shows that a uniform scalar correction would result in a significant overstatement of the consumer expenditure of the bottom fractile groups"[14] (119).

Both Ravallion and Sundaram-Tendulkar raise relevant questions, as does the World Bank's *World Development Report 2001: Attacking Poverty*. The central concern of these critics is that the modified adjustment method will contain large errors and mistakenly under-estimate poverty. Their strong *assumption* is that most of the missing income accrues to the non-poor, and most likely to the rich. So while survey estimates are under-estimating average consumption, most of the difference, believe the critics, is *not* accounted for by the bottom half of the population.

The issue of under-estimation, and the question of whose consumption is being under-estimated, are empirical matters, and can therefore not be addressed merely by assertion. To this end, it should be noted that even in the US, there has been an increase in underestimation. Triplett (1997) notes that national accounts estimates of per capita expenditures in the US have grown at about 1 per cent per year faster than survey

[14] That the Sundaram-Tendulkar conclusion does not follow from their own logic, and data analysis, is documented below.

estimates. Triplett also finds that the underestimation of food was about the same as that of durable goods – both at about 0.7 percent per year. The largest amount of under-estimation - 1.7 percent per year - affects the item “durables less motor vehicles.”

The US data provides a perspective on India’s under-estimation problems. However, the magnitudes involved are radically different – rather than a 1 percent difference per year in the US, the NSS and NAS data in India have diverged by an average of 1.6 percent per year, since the early eighties. Accordingly, NSS has recorded annualized growth of 1.4 percent per annum vs. an annualized NAS consumption growth of 3 percent per annum. In this context, it is worth noting Lal-Mohan-Natarajan (2001), who use detailed data on expenditure on durables, as well as other items, to show that durable expenditure is massively underestimated by the NSS, and that this under-estimation of durables involves the poor as well.

Trends in the Survey Capture Ratio, S/NAS

These findings open the question of how accurate are the survey estimates of mean consumption expenditure? Since changes in mean expenditure have a very large impact on one’s assessment of changes in consumption and therefore poverty, it is important first of all to set out the correct methodology for assessing the level of, and changes in, these expenditures. Of course, distributional changes also affect poverty, but such changes have been observed to be minimal in India and to move in a direction favoring the poor. Mean changes meanwhile, are based on differences in *levels*, and *levels* may not be subject to the same systematic proportionate bias over time. In any case, the emphasis of this paper is on accuracy within a rough order of magnitude. Thus, if appropriate NAS-based adjustments only result in minor changes, then the NSS data on expenditures, adjusted by NAS, can be taken to be roughly accurate.

The degree of survey capture, defined as the ratio of survey means to national accounts means, affects the level of consumption and poverty at any point in time. Thus, if there are no trends evident in the survey capture (denoted by S/NA), then surveys can reliably be used to infer trends in the calculation of poverty. But calculations of survey capture assume that the national accounts estimate of current expenditures are known and reliable. This is not evident in India. Twice over the last fifteen years, in the “conversion” years of 1980-81 and 1993-94, the *nominal* expenditures have increased by high percentages. Though

estimates of *real* expenditures are known to change because of changes in base year prices, India's case is unusual because of the frequency and magnitude of these changes.

The problem of calculating the appropriate S/NA ratio is complicated by these adjustments of nominal consumption. The 1970-71 and 1980-81 base-year estimates of consumption for 1970-71 are about 9 percent apart, with the 1980-81 estimate being the higher of the two. For 1993-1994, the 1980-81 base and 1993-1994 base estimates are about 15 percent apart, with the later base year estimate being higher. There are plausible explanations for this. It is likely for instance, that with development and growth, new products arrive on the market, new tastes are created, and statistical systems improve. Any of these factors might cause the later base year estimate to reveal a different composition of consumption, e.g. with some products showing less consumption than thought before, whereas other products show more. Theoretically, the mean according to both an old and new base should be unaffected. However, the reality is that the *mean* is severely affected, and in the seventies the impact of upward revisions was a 24 percent higher consumption i.e. consumption in the late seventies was considered to be 24 percent higher in 1997 than was thought to be the case in 1983!

There are several ways in which this 24 percent increase can be allocated across the different years. One method would entail making no adjustments to data for the sixties, and then a gradual adjustment upwards from the 70s. However, no set of assumptions, or calculations, would support such a large upward adjustment for the 70s as was performed by the Central Statistical Organization (CSO) of the Indian national accounts authority.

Table 2 reports *four* national accounts estimates for per capita expenditure in current rupees, covering several selected national sample survey years since the mid-fifties. The four different NAS estimates are as follows:

(i) The NAS estimates prevailing at the time of the survey and designated as "original." By example, the 1983 estimate is the estimate based on the 1970-71 series of national accounts and the 1993-94 estimate is the one based on the 1980-81 series. Each new national account base series was developed in the latter half of the decade e.g. the 1980-81 base series was not published until the late eighties.

(ii) The 1993-94 base CSO estimates reported in RBI, *Handbook of Statistics in the Indian Economy*, 2001, and designated as RBI.

(iii) The 1993-94 NAS statistics as reported by the World Bank in *World Development Indicators*, 2002 and referred to as WB.

(iv) A "smoothed" NAS series for the 1993-94 base, with the method of smoothing outlined below.

(v) The table also contains a *fifth* estimate of nominal expenditures (NSS), namely that yielded by the national sample survey for the selected years.

The "smoothed" estimate is based on the "Occams razor" principle of straightforward, and logical, assumptions. The key assumptions are that some new information about new expenditures or new products comes to light, and, further, that these new expenditures are not at the expense of existing expenditures, but actually compose part of increased new income. The question then is, how should the *past* estimates of consumption be adjusted?

One method of deriving estimates of new means is to assume a time-period for which the adjustment needs to be made, and then derive the "final" estimates of consumption. Using this method, assume a 15 year adjustment period. A 9 percent upwards adjustment for the 1980 base is then applied in a compounded manner from 1963 to 1978, and a 15 percent upward adjustment is applied, again in a compounded manner, for the fifteen years, 1979 to 1993.

The second part of the table contains the ratio of the new and original estimates of current per-capita expenditures, as well as the (log) percentage difference between the old and new series for the 70s (1970 to 1980) and the 80s (1981 to 1993). This table reveals the NAS series as published by the World Bank to be a lot smoother than that published by the CSO. For both time-periods, the World Bank series is upgraded by about 10 percent, specifically 11.8 percent in the 70s and 8.9 percent in the 90s. The CSO series, however, shows a 27 percent increase in the first period and a mean increase of 16 percent in the second period. The official (CSO) estimates of the ratio seem to be particularly off-base in the seventies, when nominal expenditures have been upgraded to show a 31.7 percent increase for 1977-78, as compared to only an 18.7 percent increase for 1983. In comparison, the World Bank series seems to be considerably better behaved for all the years, and does not show any "spikes".

Table 2: Table on S/NAS adjusted

Year	Population	Consumption Expenditure Per Capita Per Month (Nominal)				
		National Accounts				NSS
		Original	RBI	WB	Smoothed	
1954	392.1	17.4			17.4	17.3
1957	414.6	20.9			20.9	19.8
1960-61	434.8	29.7	31.0	26.9	29.7	23.5
1967-68	522.8	50.2	54.4	49.2	51.4	43.4
1972-73	586.2	61.1	79.7	69.1	64.4	48.3
1973-74	599.6	72.4	94.4	78.6	76.8	56.7
1977-78	642.1	82.0	108.0	93.8	89.0	73.4
1983	734.1	166.8	198.0	177.1	174.8	124.8
1987-88	798.7	233.8	271.5	251.2	254.4	181.1
1993-94	898.2	463.0	533.3	547.3	533.0	327.9
1998	979.7	970.7	970.7	1002.7	970.7	462.7
1999-00	997.5	1057.2	1057.2	1062.7	1057.2	589.9

Year	Ratio			S/NA (%)			
	RBI/ Original	WB/ Original	Smoothed/ Original	Original	RBI	WB	Smoothed
1954			100.0	99.4			99.4
1957			99.8	94.9			95.0
1960-61	104.5	90.8	100.0	79.2	75.8	87.2	79.2
1967-68	108.3	98.0	102.4	86.4	79.9	88.2	84.4
1972-73	130.5	113.1	105.4	79.1	60.6	69.9	75.0
1973-74	130.4	108.6	106.0	78.3	60.0	72.1	73.9
1977-78	131.7	114.4	108.5	89.5	68.0	78.2	82.5
1983	118.7	106.1	104.8	74.8	63.0	70.5	71.4
1987-88	116.1	107.4	108.8	77.5	66.7	72.1	71.2
1993-94	115.2	118.2	115.1	70.8	61.5	59.9	61.5
1998	100.0	103.3	100.0	47.7	47.7	46.1	47.7
1999-00	100.0	100.5	100.0	55.8	55.8	55.5	55.8

Source: RBI: from Handbook of Statistics
CSO: National Accounts data for 1993-94 base
WB: from World Development Indicators (WDI)
Smoothed: is CSO series "smoothed" for base adjustments; see text.

Notes: For all years, the NAS estimates are for the fiscal years. The NSS estimate is the survey based mean estimate for the corresponding year i.e. for 1983 it is the survey year Jan-Dec, for 1999-00 it is the survey year, July '99 – June '00.

The survey capture ratio yielded by these different methods can now be assessed (Table 3). The "smoothed" NAS series yields one indicator of the trend in the S/NA ratio. Also shown in bold are the relevant ratios for the different years and the different "base prices". By example, the relevant S/NAS ratio for the sixties is the 1970 base, for the eighties it is the 1980 base, and so forth.

The estimate based on "original" NAS data shows a consistent trend downwards, and a loss of about 10 percentage points in each decade. In the sixties this ratio was in the nineties, and accordingly NSS and NAS estimates were virtually identical.[15] In the seventies, the ratio fell into the eighties, and today,1999-2000, the ratio is only 55 percent. All other S/NAS estimates show a similar downward trend i.e. regardless of which series is chosen as being the relevant one, the table evinces a strong trend downward since the sixties, and a particularly sharp break in the nineties, equivalent to 55.8 percent. In light of this, it is somewhat difficult to concur with Sen's conclusion that: "the striking result is that *there is no evidence of any large widening of the gap between the NAS and NSS estimates of nominal consumption during the 1990s*" (Sen 2001, p19, emphasis in original).

That the estimate of S/NAS has a direct bearing on the estimate of poverty in 1999, and any other year, is discussed in detail in Section 4. For the moment, it is important to emphasize that the likely decline in S/NAS between 1983 and 1999 is of the order of around 25 (log) percent. This corresponds to a decline in the S/NAS from about 72 percent in 1983 to about 56 percent today. In turn, this implies that for the NSS survey estimate to show no decline in the head count ratio, the consumption of the poor would have to have rise by 25 percent between 1983 to 1999. Equivalently, if the poor increased their consumption by (log) 25 percent, the NSS would in 1999 actually show that the poor did not reap any increase in their real expenditures! To further highlight the abnormality of this situation, it can be noted that log

15 percent over 16 years corresponds approximately to an increase of 1.6 percent a year – an increase recorded by very few countries over such an extended length of time.

[15] The importance of the S/NA ratio is highlighted by the fact that in the sixties, there was a debate raging over inaccuracies of survey estimates because they diverged by a *few* percentage points from the national accounts estimate. Today, survey estimates are *half* the NAS estimates and scholars like Sundaram-Tendulkar (2001), and Ravallion (2001) maintain that there are no problems with surveys!

Table 3: S/NAS Ratio: A Deceptively Large Fall in the 90's ?

	1973	**1977**	**1983**	**1987**	**1993**	**1999**
Mean Consumption - Rural (Rs.)	53.0	68.9	112.5	158.1	281.4	486.2
Mean Consumption - Urban (Rs.)	70.8	96.2	164.0	250.6	458.0	855.0
Urbanization Ratio (%)	20.7	22.0	23.8	24.8	26.3	28.1
Mean Consumption, Survey (Rs.)	56.7	74.9	124.8	181.0	327.8	589.8
Mean Consumption, NA '93 base (Rs.)	79.7	108.0	198.0	271.5	533.3	1057.2
Mean Consumption, NA '81 base (Rs.)	66.3	89.8	166.8	233.8	411.2	
Mean Consumption, NA '70 base (Rs.)	61.1	82.0	153.9			
Mean Consumption, smoothed	76.8	89.0	174.8	254.4	533.0	1057.2
S/NAS Ratio, '93 base	71.1	69.4	63.0	66.7	**61.5**	**55.8**
S/NAS Ratio, '81 base	85.5	83.4	**74.8**	**77.4**	79.7	
S/NAS Ratio, '70 base	**92.8**	**91.4**	81.1			
S/NAS Ratio, smoothed	**73.8**	**84.2**	**71.4**	**71.2**	**61.5**	**55.8**

Section 4: Survey and National Account Means - How to adjust for S/NAS

Based on the previous discussion, there seems to be little doubt that the survey methods are not counting the entirety of household consumption. Furthermore, it seems that the degree of under-estimation has perhaps reached alarming proportions.

The *distribution* of the under-estimation, however, remains intractable. Sundaram-Tendulkar present per capita estimates of consumption of different items according to the bottom three deciles, and the top decile. However, aggregation by such broad groups is inadequate for assessing the magnitude of under-estimation for each item, and its variation across the different deciles or percentiles. Instead, a method which obtains a multiplier for each household and each item can be used to assess the degree of under-estimation, and its location. This method is a logical extension of the Sundaram-Tendulkar exercise; the only difference is that it does for each percentile what Sundaram-Tendulkar do for broad groups.

This methodology suggests that the different under-estimation levels can be identified to some degree of accuracy, in the following manner: First, the national accounts expenditures are tabulated for each *individual* item - e.g. cereals, pulses, vegetable, fruits, dry fruits, consumer durables, education etc. A similar exercise is carried out for the survey data. Thus, two means for each item are obtained – a survey mean and a NA mean. If it is now assumed that the NA means are correct on an item by item basis, then the degree of under or over estimation for each household can easily be derived. For each individual, an average multiplier can be obtained, which is the ratio of the adjusted sum of individual and item specific expenditures, to the sum of expenditures in the survey data.[17]

[16].

[17] Since the survey does not contain estimates of imputed rent, house rent is ignored. Further, as documented by Sundaram-Tendulkar, there seems to be a genuine problem with the NAS estimate for clothing. In the 1998 NAS estimate for 1993, clothing expenditures are reported to be Rs. 48350 crores. In the 1999 NAS revised estimates, this expenditure is reduced to only Rs. 21403 crores. Which figure is correct? The first estimate of clothing is taken as the "correct" figure and the difference between the two figures – Rs. 48350 and Rs. 21403 crores, or Rs. 26947 crore, is subtracted from the figure of Rs. 143787 crores for miscellaneous goods and services.

Table 4 documents the different estimates obtained via NSS and national accounts for each item in the 1993-94 fiscal year. Under-estimation ranges from a low of 11 percent for cereals, to a high of 150 percent for clothing and footwear. These items have multipliers of 1.11 and 1.50, respectively. This means that the NAS estimate for consumption of cereals in 1993-94 was Rs. 79.3, compared to a NAS estimate of Rs. 87.8.[18] If the latter figure is correct, then each individual's consumption of cereals is under-estimated by the NSS, to the tune of 11 percent. For milk products, vegetables etc, the under-estimation is a very sizeable 90 percent , and larger than that for durables, which is 67 percent.

Given these item-wise ratios, it is now a simple calculation to adjust each individual's consumption to national accounts. Note that the resulting multiplier is *different* for each individual and a function of their consumption pattern. Table 5 aggregates individuals according to their per-capita expenditures, and reports the resulting average multiplier for each decile of households, arranged according to per-capita expenditures. The results are striking - even for the poorest decile, the under-estimation is of the order of 30 percent. The multiplier rises progressively with the wealth of the households, but the variation for the first eight deciles is in the narrow range of 30 to 46 percent. The border decile for the poor is the 40th percentile. The multiplier for this decile, 1.37, is close to the national average multiplier of 1.41.

Two major results emerge . First, that it is *not* the case that the multiplier is the same across all deciles, though a uniform multiplier holds, within a small margin of error, for the first 8 deciles. Second, even for the poorest decile, the adjustment multiplier is large, approximately 25 to 35 percent. In other words, the adjusted consumption of the poor is some 30 percent higher than that reported by the NSS. Third, for calculations of head count ratios, the assumption of a constant multiplier across all households – as suggested in Bhalla(2002a) and questioned by various authors – is surprisingly quite accurate!

But are these multiplier results plausible? Is it reasonable to expect that most of the missing consumption is accounted for by the rich. Indeed it is! The adjustments

[18] All figures are per capita per month and the national population in 1993-94 is taken to be 891 million

preserve the original distribution for each *item*. Since the top 20 percent of the population

Table 4 : Item-wise Estimates of Consumption – Survey and National Accounts, 1993-94

Grp. No.	S.No.	Item	Per Capita Per Month		Multiplier
			NSS	NAS	NAS/NSS
I	A	Cereals + Gram+ Cereal Substitute +Pulses	79.3	87.8	1.11
	B	Edible Oils	14.4		
	C	Sugar + Beverages	26.3		
	D	Salt + Spices	7.9		
II	E	Edible Oils + Sugar & Beverages + Salt & Spices	48.6	63.8	1.31
	F	Milk + Milk Products	31.8		
	G	Meat , Egg & Fish	10.8		
	H	Fruit & Vegetables	24.8		
III	I	Milk & Milk Products+ Meat, Egg & Fish + Fruit & Vegetables	68.5	129.9	1.90
IV	J	Food (I+II+III)	196.4	281.6	1.43
	K	Pan + Tobacco + Intoxicants	9.4	10.8	1.16
	L	Clothing	16.8		
	M	Footwear	3.0		
V	N	Clothing + Footwear	19.7	49.3	2.50
VI	O	Fuel + Light	23.2	20.0	0.86
VII	P	Durable	9.5	15.8	1.67
VIII	Q	Miscellaneous Goods + Services	62.3	109.3	1.75
IX	R	Non- Food (V+VI+VII+VIII)	114.7	194.4	1.70
X	S	Total	311.0	476.0	1.53

Source: Unit record data NSS 1993-94 Consumer Expenditure Survey and National Accounts Statistics (1999).

Table 5 : Decile consumption and adjustment multipliers

Decile	Per Capita Expenditures		Multiplier
	NSS	NSS Adjusted to NA	
1	121	158	1.30
2	163	217	1.33
3	191	258	1.35
4	217	298	1.37
5	245	341	1.39
6	277	391	1.41
7	317	455	1.43
8	375	548	1.46
9	476	707	1.49
10	1006	1537	1.53
Average	339	491	1.41

Source: Unit record data NSS 1993-94 Consumer Expenditure Survey and National Accounts Statistics (1999).

Notes: 1. The NSS adjusted figures for each decile are obtained by matching the total expenditures for each item by the multiplier shown in Table 1.

2. The "multiplier" for each decile is the ratio of the NAS- adjusted survey figure (column 3), to the NSS estimate (column 2).

command about 45 percent of expenditures, they can also claim 45 percent of the missing expenditures. Further, the large under-estimation of food items should be noted, which is about 42 percent, compared to 68 percent for non-food items. Food items have

a low income elasticity – and there is a physical limit to how much extra food the rich can consume. So the “benefits” of under- estimation of food items accrue “disproportionately” to the poor, as do benefits of underestimation of non-food items accrue “disproportionately” to the rich. Further to this point, it is worth noting that Item III – milk and milk products and meat, etc. plus fruits and vegetables – is estimated by the survey to be just more than half the national accounts estimate. But the rich cannot possibly be drinking all this milk and eating all the missing food. Accordingly, it must be that the non-rich have also under-estimated their food consumption by large proportions. Generally, the large error for the food group suggests that whatever adjustments are done to the Indian survey data on the basis of national accounts data, they will yield the result of a reasonably constant multiplier.

Section 5: **Poverty in India, 1999-2000**

A non-controversial statement is that there are general problems with both NSS and NAS data, in addition to specific problems with the survey data for 1999, owing to the use of simultaneous 7-day and 30 day recall periods for food consumption. The following section attempts to circumvent these problems by deriving a lower-bound estimate of consumption in 1999, and thus consumption growth and poverty trends across the 90's, using data on growth in wages between 1983-1999 drawn from the "uncontaminated" NSS Employment-Unemployment Survey of the same year. An assessment of poverty trends in the 90' is important in so far as it is necessary to establish whether economic reforms initiated in the nineties were anti-poor in their impact. The anti-poor hypothesis can be tested by establishing what happened to both consumption inequality and the incomes of the poor.

Consumption Inequality

As hypothesized by Kuznets, it is "natural" to expect the distribution of income or consumption to first worsen in the context of economic reforms, before peaking and becoming better, yielding an inverted U-curve hypothesis. This has also been verified empirically for several countries (see Bhalla 2002d). A contrary position is taken by a recent study (Banerjee-Picketty) that suggests income distribution in India has worsened with rapid growth. However, this study is based on tax-records, and makes several assumptions, the most important of which is the assumption that tax compliance levels have stayed the same for each income group. This position has however been shown to be false. Bhalla (2002b).

The NSS data is a comprehensive source for trends in consumption inequality, and Table 6 documents the evidence that it presents. If there is any trend, it is towards greater equality. Between 1983 and 1999, the Gini has improved sharply in the rural areas, falling from 30.4 to 26.30, and worsened marginally for the urban areas, rising from 33.9 to 34.7. For the entire country, the Gini shows a mild improvement, falling from 32.5 to 32. The first poorest quintile shows the sharpest improvement, equivalent to a 6 percent increase in its share, from 8.42 to 8.93 percent.

Table 6: Trend in Consumption Inequality in India

	1983	1987-88	1993-94	1999-00
Consumption Distribution, NSS				
Rural				
Share of Quintile 1	8.9	9.3	9.6	10.1
Quintile 2	13.1	13.2	13.5	14.0
Quintile 3	16.7	16.5	16.9	17.3
Quintile 4	21.7	21.4	21.6	21.9
Quintile 5	39.6	39.6	38.5	36.7
Gini	30.4	29.9	28.6	26.3
Urban				
Share of Quintile 1	8.1	8.0	8.0	7.9
Quintile 2	12.1	11.7	11.9	11.7
Quintile 3	15.8	15.5	15.7	15.7
Quintile 4	21.5	21.4	21.6	21.7
Quintile 5	42.6	43.4	42.8	43.0
Gini	33.9	35.0	34.4	34.7
National				
Share of Quintile 1	8.4	8.6	8.7	8.9
Quintile 2	12.5	12.4	12.4	12.6
Quintile 3	16.2	15.8	15.9	16.0
Quintile 4	21.4	21.1	21.1	21.1
Quintile 5	41.4	42.1	41.8	41.4
Gini	32.5	32.9	32.5	32.0

Source: Unit record data, National Sample Surveys for the selected years.

The conclusion that equality improved in India between 1983 and 1999 is reasonably firm, at least according to the NSS expenditure surveys. Further, there are no signs of a rise in inequality during the so-called "reform" period, 1993-1999. The trend of a small increase in equality continues during this period. Furthermore, as discussed in detail in Bhalla (2002d), the question of whether growth has been pro-poor or not is *identical* to the question of whether there has been an improvement in inequality. No additional assumptions, computations or regressions are required to establish this.

This small improvement in inequality during 1983-1999 suggests that even if there was zero growth in consumption, poverty in India in 1999 should be approximately a few percentage points lower than the 44.5 percent poverty level in 1983. This suggests that the "contaminated" 1999-00 survey is not needed in order to derive a worst-case estimate of poverty. If the worst possible 1983-based distribution is assumed for 1999-00, then an estimate of growth in mean expenditures between 1983-1999, can provide us with a worst-case estimate of poverty in 1999-00. In Bhalla (2000a), a method was offered to estimate mean consumption growth between 1983 and 1999 using national accounts estimates of change in the availability of major items of consumption like cereals, sugar and edible oils. However, this method can be criticized for its assumptions, particularly in its part reliance on non-survey data, and with regard to the assumptions about stability of the Engel curve, as well as the assumptions/calculations pertaining to the income and price elasticities.

Estimating Consumption in 1999 from wage growth 1983-1999

To circumvent such concerns, it is worth exploring an alternative, *exclusively survey*-based method of deriving a *lower-bound* estimate of consumption growth in India between 1983-1999. It is based on estimating the growth in wages of the lowest paid workers in India, namely the unskilled laborers in the rural areas and more specifically, the ploughman. Since the absolute poor can be assumed to have zero savings, changes in wage income are expected to translate into changes in mean consumption.

The large scale employment-unemployment surveys of the NSS contain estimates of *wages* for all members in the household. This is not a comprehensive income survey, since only limited data are available for households engaged in business or self-

employment. But the estimates of wages of casual workers in agriculture, who occupy the least-skilled jobs, should be reasonably accurate. Table 7 reports on both the

Table 7: Wages and Wage Growth in India, 1983-1999

	1983	1999	Growth Annualized
Wages			
Avg. Daily Wages for Males, Field Labour & Ploughman			
(The data reported are for years 1981-82 & 1996-97)			
Current Prices	7.7	43.0	11.5
Real	21.4	33.5	3.0
Wages, from NSS data			
Median Wage, Rural Male Casual Labour (excluding Public Works)			
Current Prices	184.7	1064.8	11.0
Real	418.4	666.8	2.9
Median Wage, Rural Female Casual Labour (excluding Public Works)			
Current Prices	116.0	651.4	10.8
Real	260.4	405.6	2.8
Median Wage, All Workers Male			
Current Prices	309.0	2105.0	12.0
Real	313.5	541.0	3.4
Median Wage, All Workers Female			
Current Prices	161.5	1105.0	12.0
Real	169.8	300.0	3.6

Source : Agricultural situation in India & NSS rounds 1983, 1999-00

nominal and real wages for the different states between the survey years 1983 and 1999. The latter are deflated by the consumer price index for agricultural labourers. The changes in both the mean and the median wage are then reported, although there is reason to believe that that the estimate for the mean wage is not very reliable, especially for 1983, and that the median wage will be less contaminated by outliers. . Rather than attempt to clean the data by "censoring" such observations, the more defendable method of choosing the median has been adopted.

Table 7 also contains wage data from another alternate source, namely, the *Agricultural Situation in India (ASI)*. Since this source contains surveys of labor markets, its data are a useful cross-check on the mean growth observed by asking laborers about the hours they worked, the wages they received, etc. Table 7 documents the concomitant increase in consumption and income, and Table 8 reports the increase in prices in India for the period 1983-1999, according to various indices.

The two sources on nominal wages (NSS and ASI) match to a large degree. The estimated rate of increase based on ASI data is 11.5 percent per annum, which corresponds closely to the NSS figure for males of 11 percent and females of 10.8 percent per annum. The NSS wage data also sheds some light on the inaccuracy of the CSO adjustments to nominal expenditures noted earlier. This annual increase in nominal wages is higher than the annual increase in nominal GDP according to CSO of 10.4 percent per annum, but lower than the growth recorded by the World Bank of 11.1 percent per annum, and our "adjusted" CSO growth of 11.3 percent per annum (Table 8a). Notably, the NSS expenditure survey shows an increase in per capita consumption of only 9.4 percent per annum, considerably below the increase of 11 (or 11.5) percent per annum recorded for unskilled rural wages. This is another indication that the survey-capture ratio in India has declined sharply during the last two decades.

Table 8a: Consumption, Income & Inflation in India, 1983-99

		1983	1999	Growth Annualized
Consumption & GDP per capita, National Accounts				
Consumption, Current Prices				
	Expenditure Per Capita Per Month			
	National Accounts, CSO	201.0	1053.4	10.4
	National Accounts, World Bank	179.8	1058.9	11.1
	National Accounts, CSO, Adjusted	174.8	1057.2	11.3
	NSS	124.8	588.9	9.7
Consumption, Constant Prices				
Expenditure Per Capita Per Month				
	National Accounts, CSO	454.8	660.8	2.3
	National Accounts, World Bank	423.0	639.9	2.6
Income, Current Prices				
GDP Per Capita Per Month				
	National Accounts, CSO	253.0	1629.0	11.6
	National Accounts, World Bank	253.2	1606.4	11.6
Income, Constant Prices				
GDP Per Capita Per Month				
	National Accounts, CSO	597.6	1054.5	3.6
	National Accounts, World Bank	599.3	1053.6	3.5

The increase in real wages and therefore consumption, is a function of the price deflator that is used. Several indices of inflation are reported in Table 8b. Deaton-Tarozzi (1999) and Deaton(2001b) report somewhat lower deflators for rural India, deriving these from NSS unit record data i.e. annual inflation of 7.6 percent in the rural areas and 8.2 percent in urban areas.[19] The official price indices used by the Planning Commission show a growth rate of 7.9 percent rural and 8.3 percent urban. Thus, a reasonable upper-bound estimate of inflation in rural India is 8.1 percent per annum between 1983 and 1999. This implies that a reasonable estimate of *real* wage growth in rural India is 2.9 percent per annum (11 percent nominal and 8.1 percent inflation) or 61 percent for the sixteen and a half year period (Jan-Dec 1983 to July 1999-June 2000).

This estimate of real wage growth allows us to derive an estimate of real income growth and therefore real consumption growth for the period 1983-1999. Given that these are extremely poor people, the easy assumption is one of zero permanent savings. So by knowing the mean consumption level in 1983, one easily obtains the mean consumption level in 1999, which, as shown above, is 61 percent higher. As discussed earlier, the worst-case assumption is one of no deterioration in the consumption distribution. So the 1983 consumption distribution can be assumed to apply in 1999 as well.

The implicit assumption is that the per capita consumption of the poor (and non-poor) increases by only the amount of the real wage increase of the *casual worker* in agriculture. It is likely of course that this is a severe *under-estimate* of the increase in incomes of the poor and non-poor. The casual worker is the least skilled worker, and there is considerable evidence to suggest that possession of skills yields a larger return. Nevertheless, since our primary concern is to obtain an upper bound estimate of the evolution of poverty, a lower bound estimate of wage growth will suffice.

[19] Deaton does not report price indices for 1983; for our purpose, the same growth for 1983-1987 are assumed as are reflected in the official data; this estimate is then grafted onto the Deaton price indices for 1987, 1993 and 1999.

Table 8b: Inflation in India, Different Measures, 1983-1999

	1983	1999	Growth Annualized
Prices			
WPI	112.8	360.9	7.3
Consumption Deflator			
CSO	44.2	159.4	8.0
World Bank	42.5	165.5	8.5
GDP Deflator			
CSO	42.3	154.4	8.1
World Bank	42.2	152.5	8.0
CPI			
Industrial Workers	108.0	428.0	8.6
Agricultural Labour	88.3	309.0	7.8
World Bank	35.5	138.4	8.5
Poverty Line, Planning Commission			
Rural	89.5	327.6	7.9
Urban	115.6	454.1	8.3
All India	95.7	363.1	8.1
Deaton Price Index [1987==100]			
(Index for 1983 has been calculated from 1987 by applying CPI growth)			
Rural	88.9	309.2	7.6
Urban	91.1	352.4	8.2

Source: RBI Handbook of Statistics, 20002
Source: World Bank: World Development Indicators, 2002
CPI: RBI Handbook of Statistics, 2002
Poverty Line: Planning Commission
Deaton Price Index: see Deaton-Tarozzi(1999) & Deaton (2001c)

The 1983 distribution can be “shocked” with various estimates of increases in real wages and therefore real consumption. Table 9 reports these estimates of the growth in consumption, and the corresponding decline in the HCR, and the estimated HCR in 1999 (the HCR for 1983 minus the predicted decline).

As noted earlier, the consumption distribution reported in this table. i.e. for 1983, is a worst case consumption distribution for 1999. A lower bound survey based estimate of expenditure growth until 1999 is given by the growth in real wages of the worst off and poorest workers in the economy – casual workers in agriculture. Combined, the two worst case assumptions yield an upper-bound estimate of poverty in India for 1999-2000. Crucially, this estimate suggests that poverty in India in 1999-2000 was no more than *15 percent* an estimate strikingly lower than the official estimate of 26.1 percent, and very close to the Engel curve based estimate of poverty of 13 percent (Bhalla 2000a). That this estimate is very plausible is also implied by Deaton(2001) who suggests that on the basis of internal NSS survey price-deflators, and proper adjustment for rural-urban price differences, and nominal expenditures as reported in the NSS surveys, poverty in India in 1999-2000 was only 18 percent.

Thus, no matter what the method, the incontrovertible conclusion based on survey data alone, is that poverty in India in 1999-2000 was considerably less than that evidenced by official documents, and considerably less than that suggested by other authors in this volume. While there can be some question about the accuracy of the NAS estimate, there can be little question that the *survey*-based estimate of poverty is in the low teens. What is also important to note is that the method of calculating poverty based on adjusted NAS expenditures reveals an estimate a lot closer to the “truth” than that estimate dictated by exclusive reliance on the expenditure surveys conducted by the NSS. The fact that the NSS surveys on employment and unemployment and wages also contain estimates at wide variance with NSS consumption arguably supports this point.

So, how do we conclude and summarize our discussion about growth, inequality and poverty in India, from 1983 to 1999? Based on a fixed poverty line, and NSS data, the Government of India states that poverty in India has declined from 45% in 1983 to a

26% level in 1999-2000 a decline of 19 percentage points. The question is whether this result is credible. What happened to inequality? NSS data for the two survey years indicates no increase in inequality. Indeed, the Gini declined over this time-period, and the share in consumption of the poor increased. An estimate of per capita consumption growth, therefore, can provide an upper-bound estimate of poverty in India in 1999-00. This estimate is provided by growth in real wages of the poorest of the poor – unskilled workers in rural agriculture. And a very lower-bound conservative estimate of their wage growth (supplied by NSS data) suggests that poverty in India in 1999 was less than 12 percent. This is in sharp contrast to official estimate of poverty of 26 percent for the same year.

Table 9: Growth in Consumption 1983-1999, and Poverty in 1999: Different Estimates

	(log) Growth	**Predicted Decline in Poverty (in %age points)**	**Predicted HCR in 99-00 (in %)**
Avg. per capita consumption (NSS data)	23.2%	18.6	26.4
NA private consumption expenditure	34.1%	27.3	17.7
Wage growth of casual workers @ 3%	49.5%	39.6	5.4
Wage growth of casual workers @ 2.8%	46.2%	37.0	8.0
Wage growth of casual workers @ 2.5%	41.3%	33.0	12.0
Wage growth of casual workers @ 2.0%	33.0%	26.4	6.6

Note: Distribution assumed to be that of 1983 NSS consumer expenditure ; uniform real consumption increases assumed as documented in column 1

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