

In-Kind Food Transfers – I

Impact on Poverty

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This paper, in two parts, reports an evaluation of existing in-kind food transfers. Part I outlines the dimensions involved, in terms of reach, transfer content and physical leakages, and deals with the impact of these transfers on poverty as officially measured. Part II reports the impact of these transfers on calorie intakes and also discusses some issues regarding the financial cost of these transfers. Contrary to the view that food self-sufficiency and income growth have reduced the need for direct food interventions, the paper reports a significant increase in contribution of in-kind transfers to both poverty reduction and nutrition. Moreover, much of this increased impact is attributable to improved public distribution system efficiency.

The first part, presented here, was motivated by some issues that arose in the context of the Tendulkar method of estimating poverty as regards its treatment of food prices. This method treats food prices differently from the earlier Lakdawala method and is sensitive to treatment of in-kind food transfers. The paper suggests a decomposition method that modifies the Tendulkar poverty lines and distinguishes between household out-of-pocket expenditures and transfers received from the PDS and mid-day meals. The poverty reducing impact of these food transfers is found to have increased over time and is more pronounced in the case of distribution-sensitive measures of poverty.

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(The Appendix Tables to this paper are placed online along with web version of this article.)

This paper develops upon some work in progress motivated by an editorial in this journal (EPW 2012). The editorial had pointed out several issues on the food aspects of poverty that arise from official 2009-10 poverty estimates using the Tendulkar methodology. Among other things, the present paper implements a suggestion to decompose Tendulkar estimates and quantify contributions to poverty reduction of the public distribution system (PDS) and school mid-day meals (MDM). Such decompositions will be required to evaluate the National Food Security Act (NFSA), and may be relevant while considering future methods of poverty estimation.

Since official poverty is defined on private consumption, the relevant decomposition requires measuring the consumption increase that beneficiaries (who access public delivery of food either free or cheaper than what they would otherwise pay) receive as implicit transfers over and above their out-of-pocket expenditure. Past efforts at such decomposition were limited by problems, both conceptual and of data availability. Fortunately, most of these can now be overcome, both because the National Sample Survey (NSS) is providing more data and because Tendulkar poverty lines allow an easy way to shift to treatment of food subsidies as household-specific transfers rather than assume that these reduce the general price level. This assumption, common to both the Tendulkar and earlier Lakdawala method, means that two similar households with the same out-of-pocket spending but one with no PDS entitlement and the other entitled to Antyodaya Anna Yojana (AAY) are both treated similarly although obviously the second is less likely to be poor. The law of averages can still deliver fairly reasonable estimates of the number of poor if distribution of PDS entitlements is random near the poverty line, but present methods of poverty measurement are clearly inadequate to assess the poverty impact of such entitlements.

Our analysis revises the Tendulkar poverty lines upward by valuing all PDS food at their market prices and then imputes as transfer to each household the difference between market cost of PDS/MDM quantities consumed and actual out-of-pocket expenditure on them. We find that the poverty reducing impact of these food transfers has increased over time. Only 1.3% of population was lifted above poverty line as a result of such transfers in 1993-94, but this increased to 2.6% in 2004-05 and to 4.6% in 2009-10. Further, although small in absolute terms, the contribution of these to total poverty reduction is surprisingly large. For example, increased food transfers accounted for 32% of reduction in the Tendulkar

headcount ratio (HCR) between 2004-05 and 2009-10 and 52% of reduction in the associated squared poverty gap (SPG). The number of poor before food transfers was 417 and 402 million in these two years, and after food transfers they were 389 to 347 million. Not only would HCR and SPG in 2009-10 have been 16% and 45% higher without in-kind food transfers, the number of poor would have increased by 13 million over 2004-05 instead of declining by 42 million.

These results may surprise many, since the same NSS data show huge PDS leakage and because it is well known that PDS entitlements are poorly targeted. Three factors account for why outcomes were better than often assumed. First, including imputed values for MDM incorporates a more efficient source of in-kind transfer than PDS. Second, although entitlements were poorly targeted, outcomes reflect strong effects of self-selection: 78% of the bottom rural quintile accessed some in-kind food transfer in 2009-10 as against only 13% of the top urban quintile. Third, unlike 2004-05, food inflation was unusually high in 2009-10, a severe drought year, so that market prices actually paid by most recipients were higher than the economic cost of PDS supply.

Overall, our results are in line with other research that has assessed beneficiary satisfaction and found improvement in the PDS. At one end, most of the rich have self-selected themselves out of both the MDM and PDS and it is their unutilised entitlements which account for a substantial part of measured leakage. At the other end, there was considerable improvement after 2004 in PDS access of the relatively poor in almost all states. In particular, Chhattisgarh and Odisha joined the southern states to extend near universal coverage while reducing leakage. By 2009-10, over 90% of the rural poor got some food transfer in 12 (and over 75% in 18) of the 30 states. Nonetheless, there continued to be laggards and the impact of in-kind food transfers on poverty even in 2009-10 was less than if all related central and state government expenditures had been distributed as untargeted cash transfers without leakage and at no delivery cost.

However, although gauging the impact of in-kind food transfers on consumption poverty is important, this is not the only or even main purpose of in-kind food transfers. The stated purpose of food transfers has always been food security in the sense of (i) assuring affordable food at times of distress; and (ii) enhancing food availability and its access so as to improve nutritional intake and associated outcomes, on which India scores even lower than on poverty. For example, the Supreme Court's 2001 order that made the MDM mandatory in government primary schools was aimed not at reducing poverty but to reduce classroom hunger on the assumption that well-fed children will pay more attention to learning. The MDM did lift 1.3% of population above poverty line by 2004-05 but, since school attendance has increased with the MDM and now nears 100% at elementary level, the full impact of MDM goes well beyond the poor and its effect on children is much more than its impact on poverty.

The case of the PDS is more complicated. With the shift to the targeted PDS (TPDS) in 1997, the earlier universal access at relatively low unit subsidies was replaced by much higher unit subsidies targeted towards the poor. But this had a negligible

impact on consumption poverty; and instead leakages increased sharply between 1993-94 and 2004-05, along with a decline in percentage of households who actually accessed PDS cereals. This happened because the PDS got targeted away from regions where it functioned well to those where it had earlier functioned poorly and also because of poor targeting within regions. But, as noted above, the PDS has improved considerably after 2004 with most states taking steps to improve its functioning and some reverting to a near universal PDS. Leakages have reduced, and there is very strong evidence that this is related to the improvement in access. Moreover, as its very large impact on poverty in 2009-10 shows, the PDS was able to deliver when most needed – during the worst drought in 37 years when wholesale price inflation (WPI) of food articles increased by 21% in a single year. Nonetheless, critics of the PDS remain sceptical, pointing to the possible inefficiencies of high unit subsidies.

Cash Transfer Issue

This issue has come to the fore in the run-up to the NFSA in the form of a debate on whether cash transfers can be more effective than in-kind food transfers. The main argument for cash transfers is that delivering a rupee directly to an intended beneficiary may cost less than the present elaborate but leaky system of physical procurement and distribution. This, of course, depends on how market prices of food compare with the economic cost of public delivery, on costs of extending banking reach to all beneficiaries and on the likely leakages from cash transfers – matters which are far from settled. But, even if a rupee could be delivered cheaper directly than through PDS, delivering cash may not deliver full benefits of in-kind food transfers. Quite apart from the fact that producers also benefit from minimum support prices (MSP) in the present system, the right to food and most women activists not only doubt that indexation will be full but also argue that replacing PDS by equivalent cash would be detrimental to nutrition intake. We do not go into the issue of benefits to farmers from MSP operations, but it should be noted that costs of procurement (excluding grain price paid) constitute about 20% of the subsidy on cereals which will not be saved by moving to cash transfers unless MSP operations are also wound up.

We do, however, examine the impact of in-kind food transfers on calorie intake. This is because supporters of cash transfers can counter the argument of activists by pointing out that consumer theory suggests that cash transfers equivalent to in-kind food transfers should lead to the same food consumption, at least by those who need to make some additional market purchase of items that they receive as in-kind entitlement. Moreover, the nutrition case for in-kind transfers appears weak at first sight because NSS data show that all-India average per capita calorie intake of households who do receive in-kind food transfers is actually lower than of those who do not. Nonetheless, this requires closer empirical examination since neither simple consumer theory nor a simple comparison of calorie intake of recipients and non-recipients are valid. Activists usually argue that male preferences dominate how cash is spent, implying that it may be invalid to assume that the same household preference

applies to both cash and in-kind food transfers. A simple comparison of recipients and non-recipients is also not valid if their income and other household characteristics (including place of residence) would in any case lead to lower calorie intake.

In order to examine this matter, we fit a simple calorie demand function and assess the impact of PDS access on calorie intake in relation to this. The results of this exercise tend to support activists who argue against cash transfers. The calorie demand function shows expected response to income, price and some other household characteristics. There is a downward shift in the function over time, in line with the observed decline in calorie intake, but the model remains robust over time and across sample selection. More interestingly, variables relating to PDS access are highly significant. Just access to PDS appears to add to calorie intake, and the calorie-elasticity of PDS transfers turns out to be twice as large as compared to additional out-of-pocket income equal to the cash equivalent of PDS transfers. Controlling for income (including the cash equivalent of PDS transfer) and other characteristics, households accessing PDS had higher per capita calorie intake than those not accessing PDS in all NSS large samples of 1993-94, 2004-05 and 2009-10, and this difference appears to be increasing over time. Our preliminary assessment is that compared to the counterfactual of no PDS, PDS increased per capita calorie intake of the population as a whole by about 6% in 2009-10, up from a corresponding contribution of about 3.5% in 2004-05.

Although preliminary, this result if confirmed would mean that PDS is helping to mitigate the well-known “calorie puzzle” whereby, despite rising incomes, India’s average per capita calorie intake has declined by over 7% since 1993-94 to below 2000 kcal/day in 2009-10.¹ To maintain even this rather low level of calorie intake without PDS would, given the observed calorie elasticity of around 0.4, have required total out-of-pocket consumer expenditures about 15% higher than actual in 2009-10. As compared to this, PDS transfers received were only 2.4% of out-of-pocket expenditure. This means that even as households are shifting expenditures away from food, with the costs of health, education, fuel and transport all rising in an increasingly consumerist society, PDS is slowing this down. This also means that the assessment of in-kind transfers requires clarity on whether calorie adequacy should normatively be considered as a social goal independent of revealed preferences of households.

Our measurement of the impact of in-kind food transfers on consumption poverty takes the normative view that the welfare benefit of PDS is limited to the cash equivalent transfer implicit in the value of subsidies that households actually receive. This procedure does not go into how households spend transfers received and respects consumer sovereignty. As noted above, PDS transfers did contribute significantly to recent reduction in consumption poverty despite leakages. But if the normative view is that calorie intake is a merit good, our subsequent analysis suggests that the welfare impact of the PDS may be much larger. Although not entirely clear why, the PDS appears to influence preferences so that the pure cash transfer required to maintain the same level of calorie intake without PDS would be several times greater than what government currently

spends on the MSP-PDS system. Alternatively, calorie intake would reduce significantly if only the current cost of this system is transferred in cash even with no leakage. Unless it is concluded that calorie intake is inconsequential for malnutrition or that India’s very high malnutrition levels no longer merit explicit concern, the “calorie puzzle” suggests that, along with technologies and price policies to produce adequate nutritious food, there should be at least equal priority to exploit the potential of the so far leaky PDS to encourage better and more balanced food consumption.

This paper is restricted to evaluation of in-kind transfers through MDM and PDS and does not consider cash transfers, e.g., social pensions and employment schemes. Although cash transfers (e.g., the National Rural Employment Guarantee Act (NREGA)) enable higher spending by recipients with possible large effects on poverty, these cannot be disaggregated from other sources of out-of-pocket expenditure in NSS consumer expenditure surveys. The paper is in two parts. Section 1 provides an overview with descriptive statistics from unit level NSS data for 1993-94, 2004-05, 2009-10 and 2011-12 of MDM and PDS reach and their transfer content. Section 2 evaluates the impact of these transfers on poverty, along with decomposition of poverty change between effects of the growth of out-of-pocket expenditures and those of in-kind food transfers. The poverty analysis is restricted to the period 1993-94 to 2009-10 since full data required to extend it to 2011-12 was not available at the time of research. However, preliminary 2011-12 indicators presented in the conclusion suggest that PDS was more effective during droughts. Part II of the paper considers calorie intakes and evaluates costs of in-kind transfers. In the context of debates surrounding the NFSA, it concludes with some lessons for policy. All-India results of all these exercises are reported in the text, with state-level estimates provided in an appendix.

1 In-kind Food Transfers: Some Dimensions from NSS

Table 1 (p 49) provides a snapshot of the reach of in-kind food transfers during 1993-94, 2004-05, 2009-10 and 2011-12. This is in terms of percentage of population, classified by state/sector specific monthly per capita expenditure (MPCE) quintile classes, who availed of them. All four NSS rounds collected details of PDS purchase at the household level, and PDS access is shown in terms both of those who purchased PDS cereals and those who purchased any PDS food (i.e., cereals or sugar). Access to MDM refers to households whose children received any free cooked meal in schools or *balwadis*. NSS began imputing values of free meals from the 64th round (2007-08),² but data on the number of meals received free from schools and *balwadis* is available for each household in the demographic block of all these NSS rounds. This is used for 1993-94 (50th round) and 2004-05 (61st round). For 2009-10 and 2011-12 (66th and 68th rounds), since data is available in both demographic and consumption blocks and are almost identical, data from its consumption block is used. The table also presents the percentage of population which received any food transfer (PDS and/or MDM).

The first point worth noting from Table 1 is that the percentage of population availing MDM, which was negligible in 1993-94,

increased very significantly by 2004-05 with a further but much more subdued increase in 2009-10 and 2011-12. This is not surprising since the central government had no MDM programme till 1995 and it became significant only because the Supreme Court passed orders in 2001 making this mandatory in government primary schools. Closely related to this fact, that MDM is almost entirely limited to government schools, is perhaps an even more significant outcome: that although not subject to income targeting, and available to all children attending such schools, the MDM is much better targeted towards the consumption poor than PDS which has officially been targeted since 1997 with distinction drawn between those below the poverty line (BPL) and those above the poverty line (APL). The majority of school-going children aged 5-11 in lower rural quintiles received MDM by 2004-05 while, although universal, almost all children in the top urban quintile were self-targeted out because their parents preferred private schools.

Table 1: The Changing Reach of In-kind Food transfers (% of population accessing)

Quintile Class	Rural				Urban			
	PDS Cereals	PDS Food	MDM	Any Food Transfer	PDS Cereals	PDS Food	MDM	Any Food Transfer
1993-94								
1	29.2	61.8	4.6	62.4	38.0	72.1	4.4	72.8
2	28.4	67.9	3.7	68.5	38.5	74.7	3.3	75.3
3	26.0	69.8	2.8	70.1	33.5	77.3	1.7	77.8
4	24.6	71.0	2.1	71.3	29.7	73.9	1.1	74.2
5	19.9	71.2	0.9	71.3	20.8	64.9	0.4	65.0
All	25.6	68.3	2.8	68.7	32.1	72.6	2.2	73.0
2004-05								
1	35.4	38.2	31.8	53.3	28.4	30.5	19.5	40.8
2	28.3	32.0	27.0	47.2	18.1	21.5	10.1	27.5
3	24.2	28.9	20.7	40.9	11.6	15.1	4.3	18.0
4	19.3	24.2	15.2	34.2	7.2	11.7	1.2	12.8
5	11.9	17.2	9.2	24.2	3.1	6.7	0.2	6.9
All	24.8	29.0	21.8	41.3	15.4	18.7	8.4	23.5
2009-10								
1	60.9	62.9	41.1	76.6	51.5	52.6	26.6	63.2
2	50.9	53.8	35.9	68.6	36.7	38.5	13.2	44.7
3	43.2	46.1	28.7	61.0	27.5	29.5	7.7	34.6
4	35.2	39.5	22.6	52.7	16.3	19.3	3.6	22.1
5	26.4	30.9	13.2	39.1	9.0	11.5	2.4	13.6
All	43.3	46.7	28.3	59.6	28.2	30.3	10.7	35.7
2011-12								
1	67.3	68.2	44.5	81.3	51.7	52.6	24.8	62.8
2	55.3	57.1	40.8	73.2	41.5	42.7	14.8	50.2
3	49.6	52.2	36.6	69.6	29.5	30.8	8.3	35.4
4	45.1	47.9	28.8	62.7	20.1	22.8	3.1	25.0
5	32.7	36.0	16.9	46.0	10.6	14.1	0.9	14.8
All	50.0	52.3	33.5	66.6	30.7	32.6	10.4	37.7

Quintile Classes are on MPCEMRP by population within each state and sector.

The second point to note in Table 1 is that the PDS reach shrunk dramatically between 1993-94 and 2004-05. The percentage of population accessing any PDS food fell from 72.6% to 23.5% in urban areas and from 68.3% to 29% in rural, with a decline in all quintile classes including the poorest. This followed the shift from universal to TPDS in 1997 and restriction of PDS sugar to only BPL cardholders from 2001 onwards. One consequence was a sharp drop among PDS users, from majority in 1993-94 to almost negligible in 2004-05, of those drawing sugar but not cereals. But even the percentage of population

accessing PDS cereals declined in every urban quintile and also in the upper rural quintiles. Part of this was policy, since APL prices were increased sharply while BPL prices were reduced. This eliminated an existing urban bias, made PDS more progressive in both rural and urban areas, but increased exclusion errors sharply.

This was not only because exclusion errors in BPL selection were very large, the customer base of fair price shops (FPS) was much curtailed by targeting, reducing their viability and effective reach. The PDS served a majority of urban households in only four states in 2004-05, down from 24 in 1993-94, and in rural areas this was down to 10 from 26. The consequent weakening of the system's earlier function of providing retail level food price stability meant that the shift to TPDS was judged a policy failure, particularly because only a third of the bottom 40% of households got any PDS benefit in 2004-05, half that in 1993-94, while leakages from PDS doubled (see Government of India 2002 and Himanshu and Sen 2011).

The third important point is that the subsequent period 2004-10 saw a reversal of the earlier shrinkage, with a majority of the poor again accessing the PDS. One reason for this was that food inflation doubled, making the PDS more attractive. Market prices of cereals increased about 65% while PDS central issue prices remained unchanged. Moreover, some states provided supplementary subsidy to make the PDS even more attractive and to also enlarge numbers entitled to BPL coverage. The percentage of poor who accessed PDS cereals in 2009-10 was much higher than in not only 2004-05 but also 1993-94 and, although inclusion errors rose somewhat, exclusion errors reduced significantly. Unlike during 1997-2004, when FPS viability decayed, many states invested to revive PDS infrastructure and to plug leakage. A number of studies show that this revival was strong and that improvements in terms of less leakage and more beneficiary satisfaction were already evident by 2007 (see, for example, Kumar 2010; Khara 2011a and b; Himanshu and Sen 2011). By 2009-10, a majority of households were accessing PDS cereals in 13 of 30 states, up from only 6 in 2004-05.

Further, this PDS revival continued into 2011-12 despite cereal inflation abating, mainly because many other states reduced PDS prices and expanded access. The number of states where the majority accessed the PDS for cereals went up to 20 and in addition there were other cases of large PDS growth which, however, fell short of majority access. The most notable such case is Bihar, so far considered worst on PDS performance. But the NSS 68th round reports that 43% of Bihar households accessed PDS cereals in 2011-12, up from only 14% in 2009-10 and less than 2% in 2004-05. This expansion, unnoticed so far, is remarkable because it went hand in hand with two other features: Bihar climbed to the top of the poverty reduction league in 2011-12 from being a laggard so far. Much more significantly, Bihar's PDS grain leakages (i.e., what NSS does not capture as PDS consumption out of official offtake figures) reduced to about 20% in 2011-12 from 65% in 2009-10 and 97% in 2004-05. Other states with similar but less spectacular rebound include Assam and West Bengal.

Overall, the national percentage of households accessing PDS cereals, that had declined from 27% in 1993-94 to 24% in

2004-05, increased to 39% in 2009-10 and further to 45% in 2011-12. Simultaneously, grain leakages which had jumped from 28% in 1993-94 to 55% in 2004-05 reduced to 40% in 2009-10 and further to 35% in 2011-12. That wider PDS access reduces PDS leakage, which Himanshu-Sen (2011) had observed with data till 2007-08, stands confirmed by results from two subsequent large sample NSS surveys. The correlation across states between access and leakage was -0.82 in 2009-10 and -0.85 in 2011-12. Moreover, as Charts 1 and 2 show with data for major states, leakages reduced around 1% for each 1% increase in access.³ This should help calm critics' fears that leakages will increase with wider access.

Table 2 presents information from these four NSS surveys regarding the value of in-kind food transfers. The value of PDS

Table 2: The Value of In-kind Food Transfers (Rs/person/month and as % of MPCE)

Quintile Class	Rural				Urban			
	Total Food Transfer (Rs)	Total Food Transfer (% MPCE)	PDS Transfer (% MPCE)	MDM Transfer (% MPCE)	Total Food Transfer (Rs)	Total Food Transfer (% MPCE)	PDS Transfer (% MPCE)	MDM Transfer (% MPCE)
1993-94								
1	3.31	2.2	1.6	0.6	4.62	2.3	1.8	0.5
2	3.36	1.6	1.3	0.3	4.95	1.7	1.4	0.2
3	3.26	1.3	1.1	0.2	4.73	1.2	1.1	0.1
4	3.44	1.1	1.0	0.1	4.50	0.9	0.8	0.0
5	3.14	0.6	0.6	0.0	3.85	0.4	0.4	0.0
All	3.30	1.2	1.0	0.2	4.53	1.0	0.9	0.1
2004-05								
1	16.69	5.5	2.6	2.9	16.26	3.8	1.9	1.8
2	14.44	3.5	1.7	1.8	10.64	1.7	1.0	0.7
3	12.42	2.5	1.3	1.2	6.76	0.8	0.5	0.3
4	10.53	1.7	1.0	0.7	3.89	0.3	0.3	0.1
5	7.02	0.7	0.4	0.3	1.23	0.1	0.1	0.0
All	12.22	2.1	1.1	1.0	7.76	0.7	0.4	0.3
2009-10								
1	55.65	11.4	7.1	4.4	49.46	7.3	4.7	2.5
2	45.79	6.9	4.7	2.2	35.99	3.5	2.5	1.0
3	39.41	4.9	3.4	1.4	27.52	2.0	1.5	0.4
4	34.55	3.4	2.5	0.9	19.46	1.0	0.7	0.3
5	26.96	1.6	1.2	0.4	13.16	0.3	0.2	0.1
All	40.49	4.3	3.0	1.3	29.15	1.6	1.1	0.5
2011-12								
1	62.64	9.2	6.4	2.8	49.28	5.1	3.7	1.4
2	57.41	6.3	4.1	2.2	40.63	2.9	2.1	0.7
3	53.52	4.8	3.2	1.6	31.11	1.6	1.3	0.4
4	49.31	3.5	2.4	1.1	21.27	0.8	0.7	0.2
5	35.44	1.5	1.1	0.4	10.50	0.2	0.2	0.0
All	51.68	4.0	2.7	1.3	30.58	1.2	0.9	0.3

Quintile Classes are on MPCEMRP by population within each state and sector. Per capita transfers refer to the total population in the quintile class, not just beneficiaries. For 2011-12, per capita transfers due to PDS consumption of rice in Tamil Nadu have been calculated assuming zero prices.⁴

food transfers as presented here is calculated household-wise as the excess, if any, of the market cost of PDS purchases (of cereals and sugar) over what was actually incurred as out-of-pocket expenditure on them.⁵ As far as MDM transfers are concerned, for 2009-10 and 2011-12 these are simply the value imputed by the NSS to these meals received free. For earlier years, the 2009-10 imputation has been extended back using data on number of meals, assuming that unit costs of school meals moved similarly to those of purchased meals.⁶

The main message from Table 2 is that the value of in-kind food transfers received by the poor has increased considerably

Chart 1: Leakage Levels and Access Levels

Pooled levels: round 61, 66 and 68

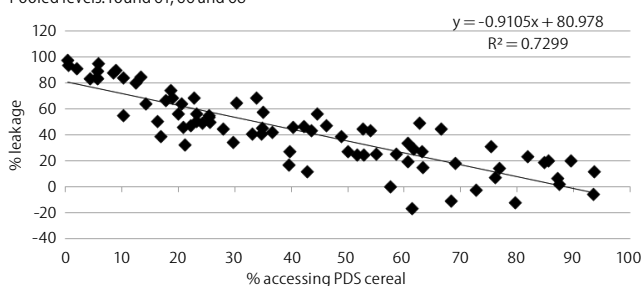
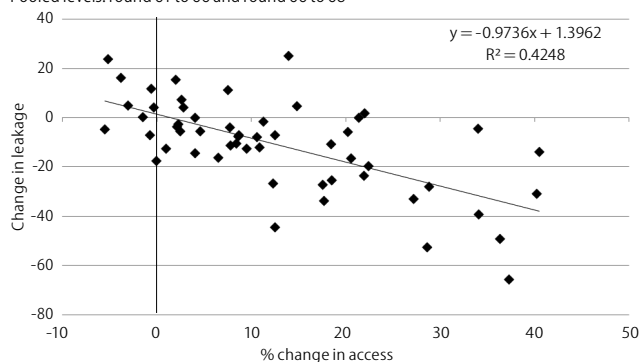


Chart 2: Leakage Change against Access Change

Pooled levels: round 61 to 66 and round 66 to 68



over time. In 1993-94, overall transfers were only around 1% of MPCE, with per capita transfers somewhat higher in urban than rural and largely invariant across quintiles.⁷ From these levels, in-kind food transfers as a percentage of MPCE had by 2004-05 increased significantly for every rural quintile except the top and declined for all urban quintiles except the bottom. The reason for this pattern was that while targeting caused PDS transfers to fall for all except the bottom quintiles, MDM transfers not only increased from 0.2% of MPCE in 1993-94 to 0.8% in 2004-05, these self-targeted themselves much better than the targeting in TPDS. This vindicates with hindsight Radhakrishna et al's (1997) observation that schemes based on self-selection, such as the Integrated Child Development Services (ICDS) and MDM, reach the poor better than PDS.

However, the period after 2004-05 has been different. Although MDM transfers rose to 1.0% of MPCE in 2011-12, this increase was relatively modest. On the other hand, PDS transfers, which had declined from 1% of MPCE in 1993-94 to 0.9% in 2004-05, more than doubled to 2.2% in 2011-12. Much of this was due to the PDS revival which nearly doubled PDS access after 2004-05 as noted in Table 1, but higher unit transfers also contributed. In fact, the latter were dominant during the drought of 2009-10 when high food inflation caused PDS transfers to reach 2.4% of MPCE for the population as a whole and 5.2% of MPCE for the bottom 40%. While these may not seem large amounts, they turn out to have had significant effects on poverty.

In this context, and since this paper is limited mainly to the period up to 2009-10, it is useful to note some facts implicit in Table 2 on the extent to which 2009-10 was an outlier from 2004-12 trends. The 2009-10 nominal MPCE was 9% below trend while nominal MDM and PDS transfers were 15% and 34% above trend, respectively. Obviously, the relative impact of in-kind food

transfers was much larger than the trend in 2009-10, as it should be since these are meant to cope with drought and inflation.

2 Impact on Poverty of In-kind Food Transfers

As mentioned at the outset, this study was motivated by an editorial suggestion in this journal to decompose the relatively high official poverty reduction of 7.3 percentage points in the period from 2004-05 to 2009-10, when per capita GDP growth was also high.⁸ Two observations were made in this context. First, that poverty reduction may have been exaggerated since NSS had imputed MDM expenditures in 2009-10 unlike in any previous thick round. Second, that official poverty reduction using the Tendulkar method was much larger than by the earlier Lakdawala method, suggesting a possibly important role of food prices which the two methods treat differently.

As far as inclusion of imputed MDM expenditure is concerned, this departure from past practice by the National Sample Survey Office (NSSO) was part of an ongoing effort to widen its definition of private consumption expenditure.⁹ As first noted by one of the present authors, the measured poverty headcount in 2009-10 would have been 31.3%, against the official estimate of 29.8%, if MDM imputations had not been included.¹⁰ The 1.5 percentage point difference is small but not insignificant as it adds up to 18 million people. There is some merit in the official decision to include in-kind transfers such as MDM in household consumption because beneficiaries receiving these do consume more even though they themselves incur no out-of-pocket expenditure. But comparability over time requires that imputed MDM expenditures should be included to calculate poverty in earlier years. As discussed in the context of transfer estimates presented in Table 2, this is possible since data on the number of mid-day meals is available.

As regards poverty estimates obtained by applying Lakdawala poverty lines to the 2009-10 distribution of consumption expenditure by uniform recall period (URP), these are 24.2% in rural areas, 23.5% in urban areas and 24.0% total when MDM is included; and 26.1% rural, 24.0% urban and 25.5% total if MDM is excluded.¹¹ The 2009-10 MDM contribution, at 1.5 percentage points, is the same as by Tendulkar method above. As against these, the 2004-05 official estimates using Lakdawala were 28.3%, 25.7% and 27.5% for rural, urban and total. This implies poverty reduction of only 3.5 percentage points between 2004-05 (without MDM) and 2009-10 (with MDM), which is less than half the corresponding official poverty reduction of 7.3 percentage points using the Tendulkar method.

The Lakdawala and Tendulkar methods have two sources of difference: (i) use of URP distribution in the former against mixed recall period (MRP) distribution in the latter and (ii) use of different poverty lines. Of these, (i) is not a cause of the lower poverty reduction with the Lakdawala method. Growth of nominal consumer expenditure during 2004-10 was slightly higher by URP rather than by MRP and distributional changes in URP also favoured more poverty reduction than in MRP.¹² On the other hand, Lakdawala poverty lines exhibit much higher implicit inflation during 2004-10 (59.7% rural and 57.5% urban) than implicit in Tendulkar poverty lines (50.6% rural and 48.5%

urban). The reason for this is that food inflation during 2004-10 (61.4% in the Consumer Price Index for Agricultural Labourers (CPIAL) and 63.9% in Consumer Price Index for Industrial Workers (CPIIW)) was much higher than general inflation (54.9% CPIAL and 48.3% CPIIW) and because the Lakdawala method reweights price indices to conform to 1973-74 consumption shares. Weights assigned to food in Lakdawala (81% for rural and 75% for urban) greatly exceed present food shares near the poverty line (59% rural and 53% urban in 2009-10). Consequently, lower poverty reduction by Lakdawala method can be attributed entirely to the use of outdated consumption weights.¹³

In contrast, Tendulkar poverty lines are constructed using Fisher's "ideal" indices that update weights continuously. Moreover, since NSS unit values are used for all items of food, fuel and clothing, changes in both prices and quantities of these items are factored in. In particular, Tendulkar poverty lines not only capture the different prices for PDS from non-PDS purchases of rice, wheat, sugar and kerosene and weight these by share of PDS purchase in total purchase; changes over time in PDS shares are also reflected. Unlike CPIAL and CPIIW that cover PDS at base year weights, Tendulkar poverty lines incorporate the large increases in PDS shares of these commodities that occurred from 2004-05 to 2009-10.¹⁴ Consequently, the Tendulkar method measures much lower food inflation and also shows higher poverty reduction than if available Laspeyres price indices had been used to update poverty lines.¹⁵

However, although the Tendulkar method tracks prices correctly, its treatment of PDS prices can be improved. Unlike market prices, at which all consumers can buy an extra unit of an item, PDS prices vary with entitlement, apply to limited quantities and most beneficiaries buy extra amounts of PDS items at market prices. As discussed earlier, a better approach from the welfare view is to calculate poverty lines that value PDS items at market prices and treat as household-specific transfers the difference between market cost of PDS purchases and actual out-of-pocket expenditure on these. This procedure is also suited to decompose the poverty impact of PDS food transfers.

Table 3: Poverty Measures Using Modified Tendulkar Poverty Lines and Applied to Different MPCE Concepts With and Without In-kind Food Transfers (in %)

	MPCEMRP (Out-of-pocket spending only)			MPCE_PDS (With PDS transfers added)			MPCE_PDS_MDM (With PDS & MDM transfers)		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Headcount ratio (HCR)									
1993-94	51.11	32.56	46.25	50.01	31.47	45.14	49.82	31.29	44.96
2004-05	43.29	25.80	38.22	41.83	24.97	36.94	40.26	24.38	35.66
2009-10	38.82	22.60	33.85	35.08	20.75	30.68	33.29	20.14	29.26
Poverty gap (PG)									
1993-94	12.77	7.79	11.46	12.29	7.41	11.01	12.19	7.34	10.92
2004-05	9.69	5.81	8.57	9.09	5.51	8.05	8.46	5.23	7.52
2009-10	8.65	5.13	7.57	7.17	4.48	6.35	6.47	4.21	5.78
Squared poverty gap (SPG)									
1993-94	4.49	2.72	4.02	4.27	2.56	3.82	4.22	2.53	3.77
2004-05	3.10	1.89	2.75	2.84	1.76	2.53	2.57	1.62	2.30
2009-10	2.79	1.71	2.46	2.16	1.43	1.93	1.87	1.30	1.70

Table 3 presents the all-India results of implementing this procedure, which involves:

(a) Construct modified Tendulkar poverty lines in which PDS purchases of rice, wheat and sugar implicit in consumption

bundles of Tendulkar poverty lines are revalued at market prices appropriate to each state and sector. Since the Tendulkar method uses unit values as implicit prices for all these items, and original calculations were available for all years, this could be done with necessary adjustments to commodity weights. These modified poverty lines (Appendix Table 3) are higher than official Tendulkar poverty lines and also show higher inflation (close to Laspeyres indices) since PDS food prices are removed.

(b) Define, with PDS transfers and MDM imputation as used in Table 2, three MPCE concepts for each household: (i) MPCEMRP which is official MRP MPCE used in 50th and 61st rounds (including only out-of-pocket expenditures on purchases of rice, wheat and sugar and on meals consumed outside home); (ii) MPCE_PDS as MPCEMRP of each household plus any receipt of PDS transfer (i.e., excess of market cost of PDS quantities purchased over actual out-of-pocket expenditure on these); and (iii) MPCE_PDS_MDM as MPCE_PDS of each household plus imputed value of free meals consumed by any member in a school or balwadi.

(c) Calculate poverty measures by applying the modified Tendulkar poverty lines separately to distributions of each of the three MPCE concepts above. This is done at state and sector level (Appendix Tables 4 to 6) and aggregated to all-India using census population weights.

Conceptually, poverty as measured by MPCE_PDS_MDM is the same as official Tendulkar poverty in 2009-10 (with imputed MDM in MPCE), and by MPCE_PDS is same as official Tendulkar poverty in 1993-94 and 2004-05.¹⁶ Poverty by MPCEMRP indicates what poverty would have been if households had to rely only on their out-of-pocket expenditure without the in-kind food transfers through the PDS or MDM.

Table 4: Decomposition of Poverty Reduction (in %)

	1993-94 to 2004-05				2004-05 to 2009-10			
	Out of Pocket	PDS	MDM	Total	Out of Pocket	PDS	MDM	Total
Annual percentage points poverty reduction								
Headcount ratio (HCR)								
Rural	-0.71	-0.03	-0.13	-0.87	-0.89	-0.46	-0.04	-1.39
Urban	-0.61	0.02	-0.04	-0.63	-0.64	-0.20	-0.00	-0.85
Total	-0.73	-0.02	-0.10	-0.85	-0.87	-0.38	-0.03	-1.28
Poverty gap (PG)								
Rural	-0.28	-0.01	-0.05	-0.34	-0.21	-0.18	-0.01	-0.40
Urban	-0.18	0.01	-0.02	-0.19	-0.14	-0.07	0.00	-0.20
Total	-0.26	-0.01	-0.04	-0.31	-0.20	-0.14	-0.01	-0.35
Squared poverty gap (SPG)								
Rural	-0.13	-0.00	-0.02	-0.15	-0.06	-0.07	-0.00	-0.14
Urban	-0.08	0.00	-0.01	-0.08	-0.04	-0.03	0.00	-0.06
Total	-0.12	-0.00	-0.02	-0.13	-0.06	-0.06	0.00	-0.12
As percentages of total poverty reduction								
Headcount ratio (HCR)								
Rural	81.8	3.8	14.4	100.0	64.1	32.7	3.2	100.0
Urban	97.8	-3.8	5.9	100.0	75.5	24.1	0.5	100.0
Total	86.3	1.8	11.8	100.0	68.3	29.5	2.2	100.0
Poverty gap (PG)								
Rural	82.6	3.2	14.2	100.0	52.3	44.2	3.5	100.0
Urban	93.8	-3.8	10.0	100.0	66.7	34.3	-1.0	100.0
Total	85.0	2.1	12.9	100.0	57.5	40.2	2.3	100.0
Squared poverty gap (SPG)								
Rural	84.2	2.4	13.3	100.0	44.3	52.9	2.9	100.0
Urban	91.2	-3.3	12.1	100.0	56.3	46.9	-3.1	100.0
Total	86.4	1.4	12.2	100.0	48.3	51.7	0.0	100.0

These modified Tendulkar poverty measures by different MPCE concepts allow decomposition of the contribution of in-kind food transfers to poverty reduction. The difference between a poverty measure by MPCE_PDS_MDM in any year and the corresponding measure by MPCE_PDS is the contribution made by MDM transfers to that poverty measure in that year. Similarly, the difference between a poverty measure by MDM_PDS and the corresponding measure by MPCEMRP in any year is the contribution made by PDS transfers to that poverty measure in that year. Changes over time in these differences in poverty measures between MPCE concepts are valid measures of contribution of in-kind food transfers to overall poverty reduction.

Another way to appreciate Table 3 is to recast it to show how much of the total poverty reduction was from in-kind food transfers. Table 4 presents this decomposition which involves separating out the contribution of out-of-pocket expenditures of households from that of transfers they received from PDS and MDM. This is done both in terms of annual percentage point poverty reduction due to each of these components and in terms of percentage of total poverty reduction contributed by these components.

Mid-Day Meals' Impact

As far as the impact of the MDM on all-India poverty headcount is concerned, this was only 0.2 percentage points (both rural and urban) in 1993-94 (Table 3 differences between MPCE_PDS_MDM and MPCE_PDS). But expansion of the MDM after 2001¹⁷ caused this impact to rise to 1.3 percentage points (1.6 rural and 0.6 urban) in 2004-05 and the 2009-10 impact was only marginally higher at 1.4 percentage points (1.8 rural and 0.6 urban). The MDM impact on higher order poverty measures show a similar large one-time jump, e.g., on SPG this was 0.05, 0.23 and 0.23 in 1993-94, 2004-05 and 2009-10. Thus, as Table 4 shows, the MDM contributed about 12% to overall poverty reduction during 1993-2005 by all poverty measures (HCR, PG or SPG), but this was mainly rural and one-time, with contribution to 2004-10 poverty reduction only 2%.

Although longer in operation than the MDM, the PDS also saw large changes in household eligibility, commodity coverage and pricing. In 1993-94, PDS impact on both urban and rural all-India HCR was only 1.1 percentage points¹⁸ (Table 3 differences between MPCE_PDS and MPCEMRP). In 2004-05, the rural impact improved to 1.5 percentage points but the urban impact fell to 0.8, with the overall impact of 1.3 percentage points. The impact on the SPG also increased only marginally from 0.20 to 0.22. As Table 4 shows, PDS contribution to overall 1993-2005 poverty reduction was less than 2%, so that the 1997 adoption of TPDS, which shifted PDS focus towards targeted poverty reduction, largely failed. But subsequent developments more than doubled the PDS impact in 2009-10: to 3.2 percentage points on HCR and 0.53 on SPG. Consequently, PDS contribution to overall 2004-10 poverty reduction (30% to HCR, 40% to PG and as much as 52% to SPG decline) was very large, revealing the value of PDS for the poor when food inflation is high. Although this too extended less to urban areas, states' efforts to revitalise the PDS and widen access did bring large benefits to the poor.

Finally, it is necessary to convert the percentages in Table 3 into number of people and state how many were lifted out of poverty by in-kind food transfers.¹⁹ In 1993-94 there were 413 million people who were poor on the basis of out-of-pocket consumer expenditures. Of these, 11.5 million were lifted above the poverty line by in-kind food transfers, overwhelmingly by the PDS (10 million). In 2004-05, the number of people who would be poor without food transfers had risen to 417 million, of whom 28 million were lifted above poverty by in-kind food transfers, with PDS and MDM contributing equally. In 2009-10, despite a severe drought, the number of people who were poor without food transfers fell to 402 million and 55 million of these were lifted out of poverty because of food transfers, 38 million by the PDS alone. The bottom line is that population growth continued to erode the rather limited poverty reducing impact of GDP growth during 1993-2010 and that PDS and MDM, each on its own, lifted more people out of poverty in 2009-10 than income growth during the entire period.

These stark results on the number of poor highlight an important observation from Table 4: that although income growth (i.e., increase in out-of-pocket spending) is clearly the main driver of poverty reduction, this contributed rather little to the large acceleration in the pace of overall poverty reduction between 1993-2005 and 2004-10. The acceleration in the pace of HCR reduction that can be attributed to income growth was only from 0.73 to 0.87 percentage points per annum. Moreover, the pace of reduction of inequality sensitive poverty measures that can be attributed to income growth actually decelerated, e.g., this halved from 0.12 to 0.06 percentage points per annum in case of the squared poverty gap. These outcomes do raise valid concerns about the extent of inclusiveness of the growth process, particularly since the impact of out-of-pocket expenditures above extends beyond pure GDP growth and also includes large post-2004 increases in cash transfers from MGNREGA and social pensions.

But this should also not entirely surprise us because 2009-10 was a severe drought year with very large intra-year food inflation. Estimates based on Laspeyres indices had initially suggested that poverty levels could rise above the past trend and hence the unusual decision taken to repeat the thick sample NSS consumer survey in 2011-12. However, because the Tendulkar method is sensitive to PDS, this revealed much larger poverty reduction than expected. The decomposition above reassigns this as the PDS effect and uses poverty lines that imply higher inflation than the original Tendulkar lines, thus measuring lower growth of real out-of-pocket expenditures. That, nonetheless, 2004-10 HCR reduction due to out-of-pocket expenditures turns out better than the 1993-2005 trend, is important in view of the fact that it is now known that the 2011-12 survey shows a much larger reduction in poverty than was evident in the already significant acceleration between 1993-94 to 2004-05 and 2004-05 to 2009-10.

The big picture that is emerging regarding post-2004 poverty reduction is that drought and inflation in 2009-10 did cause poverty to rise well above the underlying trend but that this underlying trend had actually accelerated much more than

earlier thought. The official estimates of the headcount ratio, 45.3% in 1993-94, 37.2% in 2004-05, 29.8% in 2009-10 and 21.9% in 2011-12, imply that the pace of poverty reduction accelerated from 0.74 percentage points per annum during 1993-2005 to 2.19 percentage points per annum during 2004-12; and that the actual HCR in 2009-10 was 3.6 percentage points higher than its trend level of 26.2%. But the more interesting questions from the point of view of this paper, regarding the contribution of in-kind food transfers to the trend change and to poverty alleviation during droughts, require extending the decomposition above to 2011-12. However, no final results on this can be offered here since a key input for this analysis, the recalculation of official Tendulkar poverty lines to exclude the impact of PDS prices, still awaits availability of detailed Planning Commission working sheets on its official poverty line calculations.

Preliminary Results from 2011-12

Nonetheless, a preliminary recalculation of official poverty lines was done with the unit level 68th round data that was used to calculate the value of in-kind transfers in the previous section. Provisional results of the decomposition using this suggest that:

(a) The HCR using MPCEMRP, which was 38.2% in 2004-05 and 33.9% in 2009-10, declined to 26.8% in 2011-12. This implies that the out-of-pocket income component of poverty reduction accelerated from 0.73 percentage points per annum during 1993-2005 to 1.63 percentage points per annum during 2004-12. The 2009-10 HCR by this measure was 12.5% above trend.

(b) The impact of in-kind food transfers on HCR reduction, which was 2.6 percentage points in 2004-05 and 4.6 percentage points in 2009-10, increased further to 4.8 percentage points in 2011-12. This implies that in-kind food transfers, which had lifted 28 million people above the poverty line in 2004-05 and 55 million people in 2009-10, lifted 59 million people above the poverty line in 2011-12. This also implies that the contribution of in-kind transfers to trend HCR reduction, which was 0.12 percentage points per annum (0.02 PDS and 0.10 MDM) during 1993-2005, increased to 0.32 percentage points per annum (0.25 PDS and 0.07 MDM) during 2004-12. On this trend, in-kind transfers would have lifted 50 million from poverty in 2009-10 but the actual impact (particularly of PDS) was to lift 10% more during the drought.

(c) As far as higher order poverty measures are concerned, the sharp deceleration noted in Table 4 regarding contribution of out-of-pocket income growth is no longer evident for 2004-12. For example, this contribution to SPG reduction is found to accelerate from 0.12 points per annum during 1993-2005 to 0.15 points per annum during 2004-12. But, with this still anaemic compared not only to acceleration of GDP growth but also HCR reduction, the inclusive content of growth remains less evident in the inequality sensitive poverty measures which had increased sharply over trend in the drought year 2009-10.

(d) Simultaneously, 2011-12 data show less impact of in-kind food transfers on trend reduction of higher order poverty. For example, while the contribution of the PDS to SPG reduction did accelerate from nil during 1993-2005 to 0.03 points per annum during 2004-12, this is half that reported in Table 4. What appears to have happened instead is that PDS delivered 35%

more SPG reduction than the trend in 2009-10, roughly the same magnitude as already noted regarding the deviation of the value of PDS transfers from trend during the drought.

Thus, provisional decomposition with 2011-12 data continues to show acceleration of trend poverty reduction due to in-kind food transfers after 2004-05, albeit a bit slower. This also shows that these food transfers (particularly PDS) played a significant additional role during 2009-10 when out-of-pocket real incomes fell below trend due to drought and inflation. The main revision from 2011-12 data is of course that the trend poverty reduction due to growth of out-of-pocket incomes is nearly twice that reported in Table 4 with 2009-10 data. But it is important to note that not only are incomes of the poor uncertain, the provisional decomposition implies that HCR, PG and SPG would have been 22%, 40% and 59%, respectively higher in 2011-12 if there had been no in-kind food transfers. These are in fact larger than corresponding ratios (16%, 31% and 45%, respectively) in 2009-10, mainly

because of the lower poverty base in 2011-12 and since over 75% of the poor and near poor already availed some in-kind food transfer.

Part 1 of this paper has quantified the reach and transfer content of PDS and MDM with NSS data for 1993-94, 2004-05, 2009-10 and 2011-12. It has also implemented a method to evaluate the impact of these on poverty by decomposing poverty change between effects of out-of-pocket expenditures and those of in-kind food transfers. We find that the importance of the latter has increased over time and that their impact on poverty is larger than usually acknowledged, particularly when food inflation is high and incomes uncertain. With high inflation and low employment growth marring an otherwise good post-2004 growth performance, the reach and impact of in-kind food transfers during this period was of considerable significance. The next part of this paper will consider (a) the effects on nutrition of these food transfers and (b) the criticisms often made regarding their high cost and inefficiencies.

NOTES

- All calculations in this paper use the 30/365 day multiple reference period (MRP) data.
- The inclusion of imputed MDM expenditure in MPCE from the 64th round onward is based on adoption of the "Use Approach" for this item, replacing the earlier "Expenditure Approach" under which MDM was not included since households do not incur any expenditure on free meals. Details and rationale of this conceptual shift is available in NSS instruction manuals for the 64th and 66th rounds. This paper assumes that NSS imputation of both value and calorie content of these meals is correct. However, on calories at least, NSS appears to be imputing more per meal than the official norms.
- State-wise percentages of population purchasing rice/wheat from PDS along with leakages are given in Appendix Table 1.
- The usual practice of NSSO is to report the value as reported by the respondent for items consumed from the PDS. However, this is only in case of those purchases for which the prices of the PDS items are non-zero. In case the PDS item is purchased/distributed free of cost, the NSSO imputes market prices for these items of consumption. So far this affected only the Annapurna households who get foodgrains free of cost. Since there is no way to identify these households from the data, the imputation of income transfer in case of these households is an underestimation. However, the NSSO has also used the same procedure in case of Tamil Nadu in 2011-12 where rice was distributed free of cost after the new government took over in May 2011. In the case of Tamil Nadu for 2011-12, the income transfer has been calculated by assuming zero value for purchase of rice from the PDS.
- To arrive at relevant market costs, the following procedure was used: for households purchasing a commodity from both PDS and market, market cost is taken as unit value of household's own market purchase. For households with no market purchase, market cost is average unit value of market purchases by all households in the FSU (First Stage Unit). In the very few FSUs where no household purchased from the market, this is the average unit value of all market purchases in the district. PDS transfer is taken as difference between market and actual cost of all PDS purchases, if this is positive.
- NSS consumption surveys have always included an item on meals purchased by households, with data on both the number of such meals consumed and their value. Using the ratios of imputed unit cost of school meals to the unit cost of purchased

- meals obtained for each state and sector in 2009-10, and assuming that these ratios did not change over time, free school meals consumed in other rounds were valued on the basis of the unit values of purchased meals, state and sector-wise.
- These results for 1993-94 are very similar to Radhakrishna et al (1997) for 1986-87. Their average per capita per month rural and urban PDS food transfers were Rs 1.58 and Rs 2.91 (1.1% and 1.3% of MPCE) average, and Rs 1.29 and Rs 2.62 (or 1.7% and 2.5% of MPCE) for only the poor.
- This averaged 7.2%, more than in any previous five years period, although 2009-10 was a drought year.
- The details and rationale of shifting to a different concept of consumption expenditure are available in NSS instruction manuals for the 64th round as well as 66th round. According to the NSSO, it has since the 64th round shifted to a mixed concept of consumption including: (i) Use Approach, (ii) First Use Approach, and (iii) Expenditure Approach. The justification of including MDM expenditure as part of MPCE is based on the "Use Approach" since household members are consuming these meals which are therefore "used" by the household. Previously, this was based on "Expenditure Approach" and not included since the households do not make any expenditure on receiving these meals. While MDM expenditure has been recorded as a separate expenditure item (item 302), there is some lack of clarity on application of this rule to other free benefits such as school uniforms, textbooks, medicines, etc.
- Himanshu: "India Undercounts the Poor", *Mint*, 26 March 2012. This reported results of an exercise using the official Tendulkar poverty lines but excluding MDM expenditure from the total consumption expenditure of households. The resulting poverty estimates for 2009-10 are 35.2% in rural areas, 21.5% in urban areas and 31.5% for all India as against the Planning Commission's official estimates of 33.8%, 20.9% and 29.8% for rural, urban and all India. That is, the decline in poverty during 2004-05 and 2009-10 is only 6.6, 4.2 and 5.7 percentage points in rural, urban and all-India as against declines of 8.0, 4.8 and 7.3 percentage points reported by the Planning Commission.
- Poverty estimates using the Lakdawala method are in Appendix Table 2
- The growth of rural nominal MPCE between 2004-05 and 2009-10 was 66.0% by URP and 64.6% by MRP. Similarly, urban MPCE growth was 69.7% by URP and 68.0% by MRP. The rural Gini actually fell for the URP distribution (from 0.30 in 2004-05 to 0.29 in 2009-10) while remaining constant (at 0.28 in both years) for the MRP distribution. The Urban Gini increased by

a similar amount for both distributions: from 0.37 to 0.38 for URP and from 0.36 to 0.37 for MRP.

- This is if the matter is viewed in terms of consumption poverty alone, respecting consumer preference. However, those who stress the importance of the calorie anchor in original poverty lines could argue that there is a case to maintain the 1973-74 weights since these at least ensure that the original food bundle with requisite calories remains affordable at the poverty line.
- The PDS share in quantity consumed increased from 12% in 2004-05 to 22% in 2009-10 for rice; from 6% to 13% for wheat, from 8% to 13% for sugar and from 71% to 81% for kerosene.
- Ahluwalia (2011) reports results of an exercise that had calculated 2009-10 poverty estimates using the same consumption distribution as officially used but applying poverty lines that were obtained by updating the 2004-05 Tendulkar poverty lines to 2009-10 using CPIAL and CPIIW. This gave a poverty reduction of 5 percentage points as against the official 7.3 percentage points decline.
- Official poverty (all-India rural+urban HCR) in 1993-94 and 2004-05 were 45.3% and 37.2% as against 45.1% and 36.9% by MPCE PDS above. Official poverty in 2009-10 (with MDM) was 29.8% against 29.3% by MPCE PDS MDM. The slightly lower poverty levels and slightly faster pace of poverty reduction by our modified method is because official Tendulkar poverty lines use median prices and PDS shares that slightly underestimate actual PDS transfers at the relevant poverty line.
- The mid-day-meal scheme, pioneered by Tamil Nadu in 1982, existed in very few states till it was officially launched as a national nutrition programme in August 1995. This was made universal following Supreme Court orders in 2001 with expansions in 2002 and 2004. It was extended to upper primary school children in 2007 and further expanded in 2009. The number of beneficiary children was officially put at 11.8 crore (8.4 crore primary and 3.4 crore upper primary) in 2009-10. For the same year, NSS 66th round reports 2,140 crore meals consumed, i.e. 182 meals per beneficiary child. This suggests negligible leakage at least in terms of meal numbers, if not of their quality.
- Only rice, wheat and sugar are included here as PDS food items since NSS gives PDS details for just these in 2009-10. However, there were more PDS food items in 1993-94 and PDS impact in that year may be underestimated. Radhakrishna et al (1997) report that PDS food transfers reduced HCR by 1.12 and 1.36 percentage points in rural and urban areas in 1986-87.
- As memo, mid-year populations were: 892, 1092 and 1187 million in 1993-94, 2004-05 and 2009-10.

Appendix Table 1: Access and Leakage in the PDS

	% Population Purchasing Rice/Wheat from PDS				NSS Consumption as Ratio of Official Offtake (MFCA)		
	1993-94	2004-05	2009-10	2011-12	2004-05	2009-10	2011-12
	Andhra Pradesh	59.3	58.5	76.8	76.1	74.6	85.3
Arunachal Pradesh	78.9	40.2	48.8	52.9	53.5	60.5	74.8
Assam	20.6	8.4	30.3	52.7	11.9	35.2	54.8
Bihar	0.7	1.9	14.1	42.7	8.8	35.4	87.8
Chhattisgarh	12.1	24.2	61.4	57.5	50.5	116.1	99.7
Delhi	45.4	5.7	10.2	12.3	10.5	15.9	19.4
Gujarat	38.4	25.5	27.9	22.7	49.6	54.9	31.0
Haryana	4.8	4.3	16.8	16.2	16.5	60.9	48.9
Himachal Pradesh	46.8	51.6	85.5	89.5	75.3	79.6	79.4
Jammu and Kashmir	20.5	39.5	68.3	79.6	82.6	110.5	112.0
Jharkhand	13.4	5.5	23.1	29.6	15.8	49.4	65.5
Karnataka	57.1	50.0	60.6	63.1	72.3	80.1	72.6
Kerala	82.1	39.7	61.7	81.9	72.6	70.7	76.4
Madhya Pradesh	12.1	20.8	42.1	36.6	53.6	53.4	57.9
Maharashtra	35.0	22.1	34.6	33.1	52.3	59.2	58.7
Manipur	4.2	0.3	8.9	5.8	2.1	9.6	4.6
Meghalaya	64.0	20.5	60.6	62.6	35.3	66.0	50.5
Mizoram	93.2	66.4	93.6	93.5	55.3	88.0	105.3
Odisha	6.9	18.6	55.0	63.3	25.2	74.3	84.5
Punjab	1.4	0.5	18.9	19.8	5.8	31.1	43.5
Rajasthan	14.5	10.2	17.7	25.4	44.7	33.3	44.4
Sikkim	50.9	43.5	46.2	53.9	56.5	52.2	56.0
Tamil Nadu	71.2	72.7	87.4	87.1	102.4	97.6	93.3
Tripura	60.9	34.8	75.3	84.8	54.6	68.3	80.7
Uttar Pradesh	1.8	5.7	23.2	25.4	16.3	43.4	45.7
Uttaranchal	59.4	21.0	35.0	69.0	67.5	42.2	81.4
West Bengal	17.2	13.2	33.7	44.6	15.0	31.3	43.2
All India	27.2	22.4	39.3	44.5	46.0	60.1	65.4

Percentage of population purchasing rice/wheat from PDS includes purchase of atta from PDS in 1993-94. The consumption from NSS has been adjusted using actual census population estimates for mid-point of survey years. Off-take from Ministry of Food and Consumption Affairs (MFCA) are from the foodgrain bulletin and also includes DCP off-take as well as ad hoc off-takes for 2011-12.

Appendix Table 2: Poverty HCR based on Lakdawala Methodology

	2004-05 (URP)			2009-10 (URP) (including MDM)			2009-10 (URP) (Excluding MDM)		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
	Andhra Pradesh	11.2	28	15.8	7.1	20.8	10.9	8.1	21.3
Arunachal Pradesh	22.3	3.3	17.6	26.2	6.8	24.2	27.6	7.0	25.5
Assam	22.3	3.3	19.7	26.2	6.8	24.2	27.6	7.0	25.5
Bihar	42.1	34.6	41.4	39.1	32.3	38.4	40.5	32.5	39.7
Chhattisgarh	40.8	41.2	40.9	43.6	50.1	44.8	46.9	50.1	47.4
Delhi	6.9	15.2	14.7	7.7	14.6	14.3	12.1	14.8	14.7
Goa	5.4	21.3	13.8	1.8	13.7	5.2	1.8	13.7	5.2
Gujarat	19.1	13	16.8	12.7	14.8	13.5	14.7	15.3	14.9
Haryana	13.6	15.1	14	17.2	19.2	17.8	17.7	19.3	18.2
Himachal Pradesh	10.7	3.4	10	4.1	11.5	4.7	6.2	12.6	6.7
Jammu and Kashmir	4.6	7.9	5.4	3.5	10.5	5.2	5.4	11.3	6.8
Jharkhand	46.3	20.2	40.3	36.5	25.7	34.3	39.0	26.5	36.5
Karnataka	20.8	32.6	25	16.8	26.5	20.2	20.8	27.6	23.2
Kerala	13.2	20.2	15	6.8	13.4	8.5	7.8	13.9	9.4
Madhya Pradesh	36.9	42.1	38.3	30.8	36.4	32.1	32.1	36.7	33.2
Maharashtra	29.6	32.2	30.7	18.8	24.0	21.0	21.4	24.7	22.7
Manipur	22.3	3.3	17.3	26.2	6.8	24.2	27.6	7.0	25.5
Meghalaya	22.3	3.3	18.5	26.2	6.8	24.2	27.6	7.0	25.5
Mizoram	22.3	3.3	12.6	26.2	6.8	24.2	27.6	7.0	25.5
Nagaland	22.3	3.3	19	26.2	6.8	24.2	27.6	7.0	25.5
Odisha	46.8	44.3	46.4	34.3	38.9	35.0	36.2	38.9	36.6
Puducherry	22.9	22.2	22.4	0.0	0.2	0.1	0.7	0.6	0.7
Punjab	9.1	7.1	8.4	8.5	8.5	8.5	9.4	8.9	9.3
Rajasthan	18.7	32.9	22.1	18.1	27.6	20.4	19.5	27.8	21.5
Sikkim	22.3	3.3	20.1	26.2	6.8	24.2	27.6	7.0	25.5
Tamil Nadu	22.8	22.2	22.5	11.6	19.7	15.2	14.3	20.5	17.1
Tripura	22.3	3.3	18.9	26.2	6.8	24.2	27.6	7.0	25.5
Uttar Pradesh	33.4	30.6	32.8	31.2	36.1	32.2	32.9	36.3	33.6
Uttarakhand	40.8	36.5	39.6	24.8	41.5	29.1	29.4	41.9	32.6
West Bengal	28.6	14.8	24.7	23.4	14.2	21.1	26.0	14.8	23.3
All India	28.3	25.7	27.5	24.2	23.5	24.0	26.1	24.0	25.5

Appendix Table 3: Modified Tendulkar Poverty Lines

	1993-94		2004-05		2009-10			1993-94		2004-05		2009-10	
	Rural	Urban	Rural	Urban	Rural	Urban		Rural	Urban	Rural	Urban	Rural	Urban
Andhra Pradesh	251.60	288.11	443.00	563.55	741.11	959.99	Maharashtra	270.21	330.04	490.99	633.20	767.76	967.60
Arunachal Pradesh	288.32	330.70	547.14	618.45	797.13	970.39	Manipur	322.30	366.34	578.11	641.13	875.08	960.53
Assam	267.84	312.68	478.33	600.03	709.99	878.89	Meghalaya	286.63	399.90	514.22	745.73	714.66	1000.64
Bihar	237.45	268.40	434.01	526.18	661.60	778.97	Mizoram	325.03	370.92	653.82	711.30	894.88	976.28
Chhattisgarh	231.07	285.30	406.62	513.70	686.05	838.72	Nagaland	381.70	412.39	687.30	782.93	1016.77	1147.59
Delhi	319.16	327.12	543.24	643.16	769.62	1043.99	Odisha	225.66	282.26	407.78	497.31	605.39	757.25
Goa	326.70	314.01	608.76	673.77	947.58	1043.66	Puducherry	221.61	269.86	415.68	506.22	683.34	795.66
Gujarat	284.72	322.90	505.82	659.18	742.75	957.18	Punjab	288.17	343.05	543.51	642.51	838.84	966.78
Haryana	295.27	312.40	529.42	626.75	798.38	980.29	Rajasthan	272.82	301.44	478.62	568.15	761.16	851.48
Himachal Pradesh	276.55	318.43	536.10	608.67	746.02	917.14	Sikkim	267.91	366.08	540.26	741.68	767.37	1038.50
Jammu and Kashmir	290.95	285.71	535.30	624.04	766.92	911.93	Tamil Nadu	260.61	299.21	485.24	576.18	725.36	865.58
Jharkhand	229.71	306.12	406.67	531.35	637.76	836.92	Tripura	284.40	322.16	461.31	558.73	696.82	815.79
Karnataka	272.01	301.43	446.07	589.31	674.24	930.67	Uttar Pradesh	244.42	283.07	435.52	532.12	674.16	807.52
Kerala	294.54	297.26	540.69	587.50	801.43	847.67	Uttarakhand	254.46	310.13	491.36	604.89	739.20	907.21
Madhya Pradesh	234.70	277.31	414.01	532.26	653.96	782.55	West Bengal	236.88	299.79	445.70	572.65	656.14	836.22

Modified Tendulkar poverty lines were constructed by re-valuing PDS purchases of rice, wheat and sugar implicit in consumption bundles of Tendulkar poverty lines at market prices appropriate to each state and sector with necessary adjustment to commodity weights.

APPENDIX TABLES

Appendix Table 4a: Poverty HCR (based on MPCEMRP definition)

	1993-94			2004-05			2009-10		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Andhra Pradesh	50.85	36.87	47.08	34.43	23.37	31.18	31.22	21.01	27.88
Arunachal Pradesh	61.50	30.62	56.97	33.55	23.53	31.42	31.06	27.62	30.29
Assam	55.82	29.14	52.74	36.38	21.78	34.45	42.78	27.49	40.65
Bihar	63.14	45.00	61.25	55.87	43.73	54.56	56.49	39.86	54.63
Chhattisgarh	57.03	28.51	51.86	56.85	28.39	50.80	66.20	25.38	56.87
Delhi	16.20	17.33	17.23	17.85	12.87	13.11	12.09	14.55	14.48
Goa	28.01	18.71	23.97	28.09	22.21	24.88	11.27	8.26	9.44
Gujarat	45.33	28.76	39.48	39.90	20.05	32.10	30.77	19.04	25.84
Haryana	40.40	24.17	36.21	24.82	22.41	24.07	20.54	23.49	21.54
Himachal Pradesh	38.32	13.83	36.12	27.36	4.55	25.10	15.11	16.90	15.29
Jammu and Kashmir	33.11	7.58	26.95	16.93	11.06	15.42	13.70	17.20	14.64
Jharkhand	66.52	42.16	61.27	51.95	23.82	45.50	46.61	32.48	43.24
Karnataka	58.21	35.49	50.99	44.67	25.88	37.96	35.83	21.85	30.52
Kerala	35.96	26.64	33.52	20.63	18.66	19.97	14.03	14.14	14.08
Madhya Pradesh	49.50	32.86	45.23	54.97	35.05	49.58	48.54	24.81	42.01
Maharashtra	59.87	30.61	48.25	49.11	25.76	38.96	34.93	19.14	27.84
Manipur	64.44	67.19	65.17	39.28	34.51	38.03	48.25	47.52	48.04
Meghalaya	38.85	24.91	36.22	15.69	24.68	17.47	21.80	25.83	22.60
Mizoram	19.39	8.29	14.17	25.15	8.95	17.01	38.06	14.11	25.78
Nagaland	20.10	22.09	20.45	10.02	4.26	8.77	19.70	25.19	21.21
Odisha	63.56	35.57	59.69	60.78	37.59	57.16	48.44	29.37	45.30
Puducherry	25.58	25.91	25.80	23.59	9.91	14.40	0.69	2.47	1.91
Punjab	20.56	27.43	22.68	22.12	18.71	20.92	16.09	18.37	16.94
Rajasthan	41.15	30.15	38.62	35.99	29.69	34.48	28.92	20.46	26.83
Sikkim	33.79	20.57	32.51	33.38	25.95	32.24	23.62	7.23	19.87
Tamil Nadu	54.09	36.94	47.77	47.03	21.69	35.47	33.94	18.16	26.38
Tripura	37.91	26.36	36.09	47.50	22.85	42.52	25.14	11.54	21.75
Uttar Pradesh	50.92	38.74	48.51	42.85	34.06	40.97	42.57	32.40	40.32
Uttarakhand	39.05	20.02	34.14	36.36	26.22	33.58	21.03	26.82	22.76
West Bengal	43.31	32.25	40.25	38.32	24.45	34.23	33.90	22.79	30.41
All India	51.11	32.56	46.25	43.29	25.80	38.22	38.82	22.60	33.85

Poverty estimates have been calculated using the poverty lines given in Appendix Table 2.

Appendix Table 4b: Poverty HCR (based on MPCE_PDS definition)

	1993-94			2004-05			2009-10		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Andhra Pradesh	47.71	34.72	44.21	31.49	22.24	28.77	23.49	17.79	21.63
Arunachal Pradesh	58.72	24.57	53.71	32.76	22.60	30.60	28.74	23.45	27.55
Assam	54.91	27.84	51.79	35.74	21.77	33.89	40.87	25.70	38.76
Bihar	62.66	44.56	60.78	55.81	43.73	54.50	55.53	39.29	53.71
Chhattisgarh	56.28	27.86	51.13	55.25	27.63	49.38	57.29	21.81	49.18
Delhi	16.20	15.67	15.71	17.85	11.96	12.28	12.09	14.45	14.38
Goa	25.51	13.90	20.46	24.08	21.15	22.48	11.03	8.17	9.29
Gujarat	43.88	27.86	38.23	38.62	19.89	31.25	28.52	17.96	24.09
Haryana	40.04	23.96	35.89	24.68	22.06	23.86	19.56	22.95	20.71
Himachal Pradesh	36.07	13.62	34.05	24.78	3.93	22.72	9.89	13.56	10.25
Jammu & Kashmir	32.43	7.03	26.30	14.72	10.66	13.68	8.48	12.55	9.57
Jharkhand	66.18	42.16	61.01	51.79	23.47	45.29	44.33	31.97	41.38
Karnataka	57.41	34.51	50.13	39.13	23.78	33.65	28.74	19.27	25.14
Kerala	33.21	23.28	30.60	19.19	18.12	18.83	10.97	10.87	10.93
Madhya Pradesh	48.99	32.24	44.69	53.82	34.40	48.57	45.07	23.71	39.19
Maharashtra	58.92	30.01	47.44	47.34	25.45	37.82	30.65	18.48	25.18
Manipur	64.33	67.10	65.06	39.12	34.46	37.90	48.20	46.67	47.75
Meghalaya	36.92	22.96	34.29	13.96	23.51	15.85	15.15	23.89	16.90
Mizoram	16.53	6.78	11.94	21.48	7.84	14.62	30.14	10.84	20.24
Nagaland	19.74	21.95	20.12	10.02	4.26	8.78	19.70	25.19	21.21
Odisha	63.20	34.84	59.28	60.34	37.31	56.75	41.31	25.95	38.78
Puducherry	24.54	22.51	23.22	22.91	8.03	12.91	0.31	2.01	1.47
Punjab	20.35	27.09	22.42	22.12	18.71	20.92	14.85	17.66	15.89
Rajasthan	40.18	29.80	37.79	35.37	29.51	33.97	27.31	19.52	25.38
Sikkim	32.83	19.31	31.53	28.82	25.41	28.30	16.96	7.23	14.73
Tamil Nadu	50.99	34.36	44.87	38.75	17.99	29.28	22.30	11.61	17.18
Tripura	35.27	24.53	33.57	44.18	22.54	39.81	17.74	8.83	15.52
Uttar Pradesh	50.74	38.16	48.25	42.63	33.68	40.72	40.49	31.49	38.50
Uttarakhand	31.95	17.30	28.17	33.42	26.01	31.39	16.78	25.78	19.47
West Bengal	42.46	31.65	39.47	37.64	24.41	33.74	31.05	22.23	28.28
All India	50.01	31.47	45.14	41.83	24.97	36.94	35.08	20.75	30.68

Poverty estimates have been calculated using the poverty lines given in Appendix Table 2.

Appendix Table 4c: Poverty HCR (based on MPCE_PDS_MDM definition)

	1993-94			2004-05			2009-10		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Andhra Pradesh	47.68	34.69	44.18	29.42	21.23	27.01	21.70	16.62	20.04
Arunachal Pradesh	57.47	24.57	52.65	27.42	21.97	26.26	27.84	23.45	26.86
Assam	54.91	27.84	51.79	35.52	21.77	33.70	39.98	25.32	37.94
Bihar	62.66	44.37	60.75	54.84	43.61	53.63	54.67	39.21	52.94
Chhattisgarh	56.24	27.86	51.09	49.50	24.16	44.11	55.45	21.44	47.68
Delhi	16.20	15.45	15.52	17.85	11.92	12.21	7.73	14.38	14.19
Goa	25.51	13.90	20.46	24.08	21.15	22.48	11.03	7.60	8.94
Gujarat	43.56	27.86	38.02	36.97	19.30	30.02	26.63	17.49	22.79
Haryana	39.89	23.96	35.78	23.41	21.60	22.84	18.22	22.75	19.76
Himachal Pradesh	36.07	13.62	34.05	21.68	3.66	19.90	7.33	12.09	7.81
Jammu and Kashmir	32.43	7.03	26.30	14.72	10.66	13.68	8.03	12.54	9.24
Jharkhand	66.03	42.16	60.89	50.84	23.45	44.56	42.86	31.56	40.17
Karnataka	57.38	34.43	50.09	35.73	23.30	31.29	24.26	18.77	22.17
Kerala	32.79	23.17	30.26	17.92	17.28	17.71	9.97	10.25	10.10

Poverty estimates have been calculated using the poverty lines given in Appendix Table 2.

	1993-94			2004-05			2009-10		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Madhya Pradesh	48.98	32.23	44.68	51.79	33.33	46.80	43.48	23.03	37.85
Maharashtra	58.82	29.96	47.35	45.78	24.83	36.67	28.34	17.82	23.61
Manipur	64.33	67.10	65.06	39.12	34.44	37.89	48.20	46.66	47.74
Meghalaya	36.92	22.96	34.29	13.96	23.51	15.85	14.22	23.89	16.16
Mizoram	16.53	6.78	11.94	21.48	7.84	14.62	28.27	9.75	18.77
Nagaland	19.74	21.95	20.12	9.85	4.26	8.65	19.25	24.93	20.81
Odisha	63.12	34.79	59.21	59.15	37.15	55.71	38.74	25.51	36.56
Puducherry	18.41	20.25	19.60	19.58	7.10	11.19	0.31	0.62	0.52
Punjab	20.35	27.09	22.42	21.92	18.71	20.79	13.95	17.50	15.27
Rajasthan	40.18	29.80	37.79	34.17	29.32	33.01	25.87	19.08	24.20
Sikkim	32.83	19.31	31.53	23.91	25.41	24.14	13.33	4.21	11.24
Tamil Nadu	48.66	32.92	42.87	34.33	16.36	26.13	19.64	10.01	15.02
Tripura	35.27	24.53	33.57	40.99	21.41	37.04	16.66	8.83	14.70
Uttar Pradesh	50.74	38.10	48.24	41.93	33.51	40.13	38.93	31.28	37.24
Uttarakhand	31.95	17.30	28.17	29.62	25.59	28.51	12.56	24.81	16.23
West Bengal	42.46	31.65	39.47	36.44	24.32	32.87	28.96	21.57	26.64
All India	49.82	31.29	44.96	40.26	24.38	35.66	33.29	20.14	29.26

Appendix Table 5a: Poverty Gap (based on MPCEMRP definition)

	1993-94			2004-05			2009-10		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Andhra Pradesh	12.44	8.84	11.47	7.54	4.83	6.74	6.73	4.80	6.10
Arunachal Pradesh	17.45	6.48	15.84	7.41	4.64	6.82	6.54	6.97	6.64
Assam	11.58	5.45	10.88	7.05	4.23	6.68	8.64	6.25	8.30
Bihar	16.20	11.39	15.70	12.74	11.43	12.59	14.26	10.59	13.85
Chhattisgarh	12.76	6.08	11.55	14.49	7.20	12.94	19.04	7.31	16.36
Delhi	1.85	4.07	3.87	1.97	2.01	2.00	0.98	3.07	3.01
Goa	7.14	2.74	5.23	5.56	4.37	4.91	1.80	1.50	1.62
Gujarat	11.17	6.48	9.51	9.59	3.92	7.36	6.07	3.97	5.19
Haryana	9.62	4.61	8.33	4.73	4.94	4.80	4.11	4.72	4.32
Himachal Pradesh	7.69	2.21	7.19	4.87	1.08	4.49	2.63	3.27	2.70
Jammu and Kashmir	6.05	1.28	4.90	2.43	2.42	2.43	1.85	2.87	2.12
Jharkhand	17.22	10.19	15.71	11.30	5.77	10.03	11.43	8.59	10.75
Karnataka	15.77	9.04	13.64	8.71	6.23	7.82	7.66	5.29	6.76
Kerala	8.59	6.05	7.92	4.47	4.11	4.35	2.94	2.60	2.79
Madhya Pradesh	13.33	7.36	11.80	13.14	8.59	11.91	12.51	6.08	10.74
Maharashtra	17.59	8.17	13.84	12.39	6.52	9.84	7.50	4.41	6.11
Manipur	12.13	15.08	12.91	5.71	5.12	5.55	7.16	9.19	7.76
Meghalaya	6.68	4.04	6.18	1.68	2.80	1.90	2.33	5.22	2.91
Mizoram	3.59	0.96	2.35	3.95	1.12	2.53	7.11	2.37	4.68
Nagaland	3.05	3.49	3.13	1.02	0.54	0.91	2.56	3.17	2.73
Odisha	16.27	8.60	15.21	17.37	9.60	16.16	12.45	6.25	11.42
Puducherry	4.72	5.35	5.13	5.39	1.33	2.66	0.09	0.33	0.25
Punjab	3.74	5.22	4.20	3.76	3.17	3.55	2.34	3.99	2.95
Rajasthan	8.95	6.68	8.43	7.05	5.75	6.74	5.24	4.14	4.96
Sikkim	5.95	3.10	5.67	6.07	3.35	5.65	4.48	1.43	3.78
Tamil Nadu	14.61	8.86	12.50	10.56	4.57	7.83	7.68	3.59	5.72
Tripura	8.86	5.38	8.31	10.43	3.90	9.11	3.86	2.18	3.44
Uttar Pradesh	12.99	9.82	12.37	9.19	7.80	8.90	8.75	7.69	8.52
Uttarakhand	7.12	4.22	6.37	6.11	5.17	5.85	3.14	5.83	3.95
West Bengal	8.90	7.30	8.46	7.94	5.29	7.16	6.57	4.96	6.06
All India	12.77	7.79	11.46	9.69	5.81	8.57	8.65	5.13	7.57

Poverty estimates have been calculated using the poverty lines given in Appendix Table 2.

Appendix Table 5c: Poverty Gap (based on MPCE_PDS_MDM definition)

	1993-94			2004-05			2009-10		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Andhra Pradesh	10.93	7.93	10.12	5.70	3.95	5.19	4.13	3.27	3.85
Arunachal Pradesh	15.48	4.67	13.90	5.87	3.88	5.45	5.29	5.50	5.34
Assam	11.12	5.20	10.44	6.70	4.06	6.35	6.83	5.61	6.66
Bihar	16.05	11.20	15.55	12.42	11.34	12.30	13.16	10.14	12.82
Chhattisgarh	12.43	5.82	11.23	10.83	5.38	9.67	10.97	4.59	9.52
Delhi	1.58	3.65	3.47	1.97	1.85	1.86	0.42	2.93	2.86
Goa	6.38	2.38	4.64	5.07	3.99	4.48	1.23	1.21	1.22
Gujarat	10.45	6.11	8.92	8.18	3.50	6.34	4.39	3.50	4.02
Haryana	9.39	4.51	8.13	4.11	4.71	4.30	3.40	4.46	3.76
Himachal Pradesh	7.04	1.90	6.57	3.22	0.78	2.98	1.15	2.16	1.25
Jammu and Kashmir	5.71	1.05	4.59	2.11	2.12	2.12	1.14	1.53	1.25
Jharkhand	16.86	10.03	15.39	10.77	5.64	9.60	8.65	7.68	8.42
Karnataka	15.14	8.64	13.07	5.55	5.14	5.40	4.08	3.84	3.99
Kerala	7.30	5.09	6.71	3.51	3.33	3.45	1.86	1.71	1.79

Poverty estimates have been calculated using the poverty lines given in Appendix Table 2.

Appendix Table 5b: Poverty Gap (based on MPCE_PDS definition)

	1993-94			2004-05			2009-10		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Andhra Pradesh	10.94	7.94	10.13	6.46	4.28	5.82	4.69	3.67	4.35
Arunachal Pradesh	16.25	4.67	14.55	7.16	4.25	6.54	5.36	5.50	5.39
Assam	11.12	5.20	10.44	6.78	4.08	6.42	7.27	5.76	7.06
Bihar	16.06	11.21	15.55	12.68	11.39	12.54	13.56	10.24	13.19
Chhattisgarh	12.45	5.82	11.25	13.66	6.81	12.20	12.60	4.96	10.85
Delhi	1.58	3.67	3.48	1.97	1.93	1.93	0.98	2.99	2.93
Goa	6.38	2.38	4.64	5.07	3.99	4.48	1.28	1.32	1.31
Gujarat	10.67	6.17	9.08	9.05	3.78	6.98	5.27	3.76	4.64
Haryana	9.42	4.51	8.15	4.68	4.85	4.73	3.61	4.51	3.92
Himachal Pradesh	7.04	1.90	6.57	3.96	0.91	3.66	1.68	2.60	1.77
Jammu and Kashmir	5.71	1.05	4.59	2.11	2.12	2.12	1.22	1.54	1.31
Jharkhand	16.94	10.03	15.45	11.08	5.69	9.84	9.85	8.18	9.45
Karnataka	15.17	8.64	13.09	6.67	5.52	6.26	5.00	4.34	4.75
Kerala	7.46	5.23	6.87	3.89	3.66	3.81	2.16	1.91	2.05
Madhya Pradesh	13.08	7.16	11.57	12.56	8.34	11.42	10.75	5.47	9.29
Maharashtra	17.16	7.97	13.51	11.64	6.34	9.34	6.05	4.09	5.17
Manipur	12.05	15.03	12.84	5.70	5.11	5.55	7.03	9.02	7.62
Meghalaya	6.29	3.65	5.79	1.47	2.78	1.73	1.65	4.88	2.30
Mizoram	2.93	0.70	1.88	3.13	0.93	2.02	5.03	1.48	3.21
Nagaland	2.99	3.38	3.06	1.02	0.54	0.91	2.56	3.17	2.73
Odisha	16.06	8.40	15.00	16.78	9.43	15.63	8.92	4.93	8.26
Puducherry	4.28	4.93	4.70	4.36	1.01	2.11	0.07	0.16	0.13
Punjab	3.66	5.13	4.12	3.75	3.17	3.55	2.05	3.72	2.67
Rajasthan	8.65	6.50	8.15	6.79	5.72	6.53	4.81	3.80	4.56
Sikkim	5.28	2.89	5.05	4.47	3.23	4.28	2.75	1.42	2.45
Tamil Nadu	13.18	7.97	11.26	7.60	3.46	5.71	4.07	1.91	3.03
Tripura	8.13	4.86	7.62	8.39	3.32	7.37	2.12	1.56	1.98
Uttar Pradesh	12.91	9.58	12.25	8.99	7.71	8.71	7.74	7.23	7.63
Uttarakhand	5.27	3.94	4.93	5.40	5.06	5.31	2.42	5.44	3.32
West Bengal	8.69	7.01	8.22	7.73	5.19	6.98	5.78	4.62	5.42
All India	12.29	7.41	11.01	9.09	5.51	8.05	7.17	4.48	6.35

Poverty estimates have been calculated using the poverty lines given in appendix table 2.

APPENDIX TABLES
Appendix Table 6a: Squared Poverty Gap (based on MPCEMRP definition)

	1993-94			2004-05			2009-10		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Andhra Pradesh	4.32	3.04	3.98	2.48	1.49	2.19	2.33	1.69	2.12
Arunachal Pradesh	6.66	2.27	6.02	2.45	1.25	2.19	2.22	2.56	2.30
Assam	3.43	1.57	3.21	2.02	1.14	1.90	2.40	2.14	2.36
Bihar	5.74	4.10	5.57	3.94	3.86	3.93	4.88	3.85	4.76
Chhattisgarh	4.01	1.86	3.62	5.27	2.58	4.70	7.01	2.82	6.06
Delhi	0.28	1.43	1.32	0.36	0.53	0.52	0.10	0.99	0.96
Goa	2.44	0.88	1.76	1.66	1.56	1.60	0.40	0.41	0.40
Gujarat	3.85	2.09	3.23	3.26	1.15	2.43	1.73	1.20	1.51
Haryana	3.25	1.40	2.77	1.33	1.62	1.42	1.24	1.31	1.27
Himachal Pradesh	2.39	0.55	2.23	1.31	0.41	1.22	0.76	0.98	0.78
Jammu and Kashmir	1.65	0.32	1.33	0.60	0.67	0.62	0.49	0.71	0.55
Jharkhand	5.98	3.45	5.43	3.45	1.90	3.09	3.79	3.22	3.66
Karnataka	5.86	3.21	5.02	2.40	2.15	2.31	2.34	1.89	2.17
Kerala	2.98	2.08	2.75	1.51	1.35	1.46	0.96	0.79	0.88
Madhya Pradesh	5.01	2.40	4.34	4.40	2.93	4.00	4.58	2.08	3.90
Maharashtra	7.01	3.14	5.47	4.46	2.31	3.52	2.29	1.48	1.93
Manipur	3.24	4.45	3.56	1.25	1.03	1.20	1.51	2.66	1.85
Meghalaya	1.71	1.02	1.58	0.29	0.53	0.33	0.46	1.37	0.64
Mizoram	0.98	0.17	0.59	1.01	0.24	0.63	1.91	0.61	1.24
Nagaland	0.71	0.77	0.72	0.19	0.10	0.17	0.58	0.52	0.56
Odisha	5.79	2.97	5.40	6.63	3.50	6.14	4.60	2.07	4.18
Puducherry	1.44	1.89	1.73	1.38	0.29	0.64	0.02	0.08	0.06
Punjab	1.00	1.55	1.17	0.97	0.77	0.90	0.52	1.20	0.77
Rajasthan	2.84	2.08	2.66	2.01	1.68	1.93	1.40	1.30	1.38
Sikkim	1.46	0.66	1.38	1.58	0.89	1.47	1.17	0.51	1.02
Tamil Nadu	5.54	3.27	4.71	3.30	1.42	2.45	2.52	1.09	1.84
Tripura	3.09	1.77	2.88	3.23	0.99	2.77	0.86	0.56	0.78
Uttar Pradesh	4.54	3.54	4.34	2.78	2.53	2.73	2.59	2.57	2.58
Uttarakhand	1.91	1.34	1.76	1.51	1.44	1.49	0.86	1.78	1.14
West Bengal	2.66	2.44	2.60	2.36	1.64	2.15	1.91	1.60	1.81
All India	4.49	2.72	4.02	3.10	1.89	2.75	2.79	1.71	2.46

Poverty estimates have been calculated using the poverty lines given in Appendix Table 2.

Appendix Table 6c: Squared Poverty Gap (based on MPCE_PDS_MDM definition)

	1993-94			2004-05			2009-10		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Andhra Pradesh	3.65	2.63	3.37	1.74	1.14	1.56	1.25	0.97	1.16
Arunachal Pradesh	5.58	1.63	5.00	1.91	0.91	1.70	1.69	2.01	1.76
Assam	3.22	1.48	3.02	1.86	1.05	1.75	1.69	1.78	1.70
Bihar	5.68	4.02	5.51	3.83	3.81	3.83	4.36	3.61	4.28
Chhattisgarh	3.87	1.75	3.49	3.49	1.75	3.12	3.10	1.44	2.72
Delhi	0.23	1.26	1.17	0.36	0.49	0.48	0.02	0.92	0.89
Goa	2.08	0.77	1.51	1.45	1.31	1.37	0.23	0.34	0.29
Gujarat	3.49	1.93	2.94	2.61	0.97	1.96	1.11	0.99	1.06
Haryana	3.15	1.36	2.69	1.11	1.51	1.23	0.96	1.19	1.04
Himachal Pradesh	2.14	0.42	1.98	0.75	0.26	0.70	0.30	0.65	0.33
Jammu and Kashmir	1.51	0.26	1.21	0.49	0.55	0.51	0.28	0.33	0.30
Jharkhand	5.81	3.38	5.29	3.20	1.84	2.88	2.59	2.70	2.62
Karnataka	5.52	3.04	4.73	1.30	1.59	1.40	1.00	1.17	1.06
Kerala	2.39	1.65	2.19	1.08	0.97	1.04	0.55	0.45	0.50

Poverty estimates have been calculated using the poverty lines given in Appendix Table 2.

Appendix Table 6b: Squared Poverty Gap (based on MPCE_PDS definition)

	1993-94			2004-05			2009-10		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Andhra Pradesh	3.65	2.64	3.38	2.06	1.27	1.83	1.55	1.22	1.44
Arunachal Pradesh	6.04	1.63	5.39	2.32	1.12	2.06	1.70	2.01	1.77
Assam	3.22	1.48	3.02	1.89	1.06	1.78	1.82	1.87	1.83
Bihar	5.68	4.02	5.51	3.91	3.83	3.90	4.52	3.66	4.43
Chhattisgarh	3.88	1.75	3.49	4.78	2.40	4.27	3.94	1.62	3.41
Delhi	0.23	1.26	1.17	0.36	0.51	0.51	0.10	0.95	0.92
Goa	2.08	0.77	1.51	1.45	1.31	1.37	0.26	0.36	0.32
Gujarat	3.60	1.95	3.02	3.03	1.08	2.26	1.43	1.10	1.30
Haryana	3.16	1.36	2.70	1.31	1.58	1.40	1.04	1.22	1.10
Himachal Pradesh	2.14	0.42	1.98	1.00	0.33	0.93	0.47	0.79	0.50
Jammu and Kashmir	1.51	0.26	1.21	0.49	0.55	0.51	0.30	0.33	0.31
Jharkhand	5.85	3.38	5.32	3.32	1.85	2.98	3.06	3.00	3.05
Karnataka	5.54	3.04	4.74	1.68	1.80	1.72	1.34	1.45	1.38
Kerala	2.46	1.72	2.27	1.23	1.12	1.19	0.68	0.55	0.62
Madhya Pradesh	4.89	2.33	4.23	4.10	2.80	3.75	3.61	1.76	3.10
Maharashtra	6.79	3.05	5.31	4.08	2.21	3.26	1.72	1.35	1.55
Manipur	3.22	4.43	3.54	1.25	1.03	1.20	1.48	2.60	1.81
Meghalaya	1.61	0.91	1.48	0.25	0.53	0.30	0.32	1.23	0.51
Mizoram	0.72	0.11	0.44	0.76	0.19	0.47	1.17	0.32	0.73
Nagaland	0.70	0.74	0.70	0.19	0.10	0.17	0.58	0.52	0.56
Odisha	5.69	2.89	5.31	6.26	3.40	5.81	2.93	1.47	2.69
Puducherry	1.32	1.78	1.62	0.97	0.20	0.45	0.02	0.04	0.03
Punjab	0.98	1.52	1.14	0.97	0.77	0.90	0.44	1.10	0.69
Rajasthan	2.71	2.01	2.55	1.91	1.67	1.85	1.26	1.18	1.24
Sikkim	1.24	0.61	1.18	1.03	0.84	1.00	0.62	0.50	0.60
Tamil Nadu	4.84	2.89	4.13	2.15	0.99	1.62	1.09	0.54	0.83
Tripura	2.79	1.58	2.60	2.36	0.76	2.03	0.39	0.35	0.38
Uttar Pradesh	4.50	3.43	4.29	2.68	2.49	2.64	2.16	2.33	2.20
Uttarakhand	1.32	1.23	1.29	1.27	1.39	1.30	0.62	1.60	0.91
West Bengal	2.58	2.32	2.51	2.27	1.60	2.07	1.63	1.42	1.57
All India	4.27	2.56	3.82	2.84	1.76	2.53	2.16	1.43	1.93

Poverty estimates have been calculated using the poverty lines given in appendix table 2.