

Poverty and Food Security in India

HIMANSHU*

Introduction

The issue of food security is back on the agenda for the developed countries but more so for the developing countries. The recent spells of global food price inflation have once again exposed the vulnerability of population in developing countries, in particular the poor¹. Among these most affected are the countries in south Asia which remains the geographical region with highest level of malnutrition. Within Asia, India is home to largest number of malnourished persons in the world. While the high levels of malnutrition are worrying, what is also intriguing is the fact that there has not been any significant reduction in malnutrition in recent past despite the fact that India has been the second fastest growing economy of the world². On the other hand, there has been concern on the deterioration in food security situation in recent years because of a continuous spell of inflation which has remained above 10% for the last three years.

The fact that this episode of slow improvement in most nutritional indicators and worsening of some of them including intake indicators has coincided with the same period of highest ever growth of Indian economy is puzzling. It is puzzling also because the most recent period between 2004-05 and 2009-10 also shows significant decline in poverty. While at the aggregate this may suggest that the growth of economy has also led to improvements in incomes of the poor, the same is not true when disaggregated at the state level. Not only there is very poor correlation between growth rates of state domestic product (SDP) and poverty reduction, it also shows very poor correlation with relative food prices and agricultural growth at state level.

* Assistant professor at Centre for Study of Regional Development, School of Social Sciences, JNU. I would like to thank Abhijit Sen for helpful discussion and suggestions. Usual disclaimers apply.

¹ Food price inflation in 2008 was followed by the food price inflation of July 2010. Although prices moderated after that, the recent spell of drought in the United States has also pushed global prices upwards particularly in corn and other cereal products. India has been witness to high food price inflation since 2008, the drought in 2009 and 2012 have also exposed the vulnerability of the food economy in India.

² The Indian Economy has grown at more than 8% per annum during 2004-2010. Although the growth rate of GDP has decelerated in the recent years, it still remains the second fastest growing economy in the world.

However, further examination suggests that the extent of poverty reduction as well as nutritional improvements may have more to do with policies at state level, particularly redistributive policies and governance of public services including the primary channel of ensuring food security, the Public Distribution System. It is in this context that a re-examination of the functioning of various social safety nets including those specifically meant for food security is undertaken. While the main focus remains the PDS, other schemes such as the Integrated Child Development Scheme (scheme for supplementary nutrition to children under six and pregnant and lactating mothers) and Mid-day Meal Scheme (scheme of free meal to school going children) have also contributed in improving the access to better food and assured supply of food to poorer households.

The analysis suggests a reversal of the trend of worsening of the access of PDS by the poor after introduction of targeted PDS (TPDS). The targeted PDS not only performs poorly in terms of stated objective of better access to poor households to subsidised food but also performs poorly on leakages and corruption in implementation of the programme. Precisely because of dissatisfaction with the targeted PDS, many state governments have undertaken state specific measures of universal or quasi-universal access to PDS along with further subsidies to provide cheap foodgrains. The success of these schemes which were initially applicable only in richer states such as Tamil Nadu and Andhra Pradesh has now been adopted by poorer states such as Chhattisgarh and Orissa which have seen significant reduction in poverty between 2004-05 and 2009-10. The other states which have made progress towards expanding the coverage are Jharkhand and Bihar. Close scrutiny of the data suggests that the high poverty reduction at national level is largely because of significant poverty reduction in states such as Orissa which are also states with high poverty incidence. The analysis also suggests that the high growth during 2004-2010 may not have been as effective in either reducing poverty or improving access to food as the food security interventions such as PDS and MDM. this has implications not only for food security for a vast majority of the population but also for poverty reduction.

This paper uses existing secondary data sources such as the National Sample Surveys and other official data to analyse the trend in food consumption, impact on poverty and

malnutrition. This will be looked in to with respect of their elasticity to growth as well as responsiveness to various interventions by the government. Particular focus will be on the Public Distribution System (PDS) which is the largest programme for ensuring food security in the country. The analysis will also look at the differential impact on households of different types such as the poor and marginalised households. The final section will draw policy conclusions based on the analysis. In particular, the analysis will focus on the existing mechanisms but also the proposed National food Security Bill of government of India which is currently in the parliament.

Background

The link between food security and poverty is not only because of the existence of poverty-nutrition traps that exist in developing countries but also because poorer households tend to spend more on food as share of their total expenditure³. Therefore, while improvements in income do tend to improve nutritional outcomes, this may not be the case always. In particular, while the elasticity of total expenditure to nutritional intake such as calories and proteins remains high, the Indian experience suggests a worsening of nutritional intakes even though overall incomes/expenditures have increased. This has been a long standing puzzle in the Indian context but also in other countries particularly in the south Asian region (Deaton and Dreze, 2009). For example, while aggregate poverty by the official poverty estimates has declined by 15.5 percentage points between 1993-94 and 2009-10, it has also been accompanied by decline in per capita per day calorie intake during the same period by 210 calories. While nutritional outcome data do not suggest a worsening of the situation during the same period, they also confirm the slow progress on improvements in nutritional outcomes.

While various explanations have been offered for this puzzle of declining nutritional intake along with declining poverty incidence, there has not been any conclusive answer to this puzzle. One of the prominent line of arguments have been offered by Deaton and Dreze (2009) which suggests that the decline in calorie intake with improved incomes may be due

³On existence of poverty-nutrition traps in India, see Jha, Gaiha and Sharma (2006), Behrman and Deolalikar (1987), Bliss and Stern (1978)

to declining requirement of calories with improvement in living conditions. On the other hand, their study does confirm the declining calorie Engel curves. On the other hand, many others including Utsa Patnaik (2010), Gaiha, Jha and Kulkarni (2010) and Gaiha et al (2012) have challenged the conclusion with the alternative suggestion of declining calorie intake being a result of falling real income levels and lower demand of calories because of rising prices. This line of thought has not only questioned the appropriateness of inflation indices used in measuring welfare improvements over time but also the claim of poverty reduction as measured by the official estimates.

This debate on declining calorie intake has also been central to the debate on measurement of poverty in India. It was partly in response to the growing criticisms against the existing poverty lines based on Expert Group (1993) that led to setting up of the Expert Group under the chairpersonship of Suresh Tendulkar in 2005. The report of the expert group, popularly known as the Tendulkar committee report sought to redefine the measurement of poverty in India by delinking it with the calorie norms but retaining the link with nutritional outcomes as available from the NFHS surveys⁴.

The most recent estimate of poverty as well as food consumption is available from the 2009-10 consumption surveys of the NSS. The estimates of poverty released by the Planning Commission based on the revised poverty lines suggested by the Tendulkar committee have already generated a debate in the country on the validity of the estimates. The main point of the debate is that certain unexplained issues had arisen regarding the food-nutrition aspect of poverty and that in this context it was necessary to test the robustness of Tendulkar poverty estimates and also attempt a decomposition of the poverty reduction. In fact, the early discussion regarding 2009-10 outcome were on the basis of applying CPIAL/CPIIW to arrive at 2009-10 poverty lines from those of 2004-05, without going through the complicated calculations suggested by the Tendulkar expert committee⁵. In view of this, it is useful to begin this discussion by presenting the results of what the 2009-10 poverty estimates convey if we used the old Lakdawala method (Expert Group 1993) rather than the Tendulkar method.

⁴ For details see Himanshu (2010)

⁵ See Ahluwalia (2011) and Thorat and Dubey (2011)

Even though the underlying data is same, the Lakdawala poverty estimates show lower decline than the Tendulkar estimates. By the Lakdawala poverty lines applied on URP consumption expenditure of 2009-10, the percentage of population below poverty line is 26.1% in rural areas, 24.0% in urban areas and 25.5% for the country as a whole⁶. The corresponding estimates for 2004-05 for rural, urban and total were 28.3%, 25.7% and 27.5%. That is, percentage point decline in poverty between 2004-05 and 2009-10 is only 2.2% in rural areas, 1.7% in urban areas and 2.0% for all areas. Further, this also implies that the annual percentage poverty decline during 2004-05 and 2009-10 at 0.43, 0.34 and 0.40 for rural, urban and all areas is only half of the annual percentage poverty decline seen during 1993-94 to 2004-05 at 0.82, 0.61 and 0.77 for rural, urban and all areas. This is contrary to the estimates for same periods reported on the basis of Tendulkar poverty lines. By the Tendulkar poverty lines, annual percentage point decline in poverty accelerated to almost double at 1.60, 0.96 and 1.47 in rural, urban and all areas during 2004-2010 compared to 0.75, 0.55 and 0.74 respectively during 1993-2005.

The difference in these two methods and their underlying trend is primarily because of the way inflation is treated in both these measures. The Lakdawala method was based on poverty estimates anchored on 1973-74 consumption expenditure estimates and used the CPIAL and the CPIIW to update the poverty lines over time for rural and urban areas. The updating of these poverty lines were based on Laspeyre index using commodity groups weights from the 1973-74 consumption expenditure surveys applying the commodity group specific inflation indices from these two sources. A large literature has already analysed the problems with using the consumer price indices from the labour bureau (CPIAL and CPIIW). The problems were not only use of outdated commodity weights but also inadequate coverage of centres (for example, CPIIW) along with problems in capturing inflation for items of consumption such as health and education and fuel in some cases. The Tendulkar committee sought to remove some of these anomalies by shifting away from the consumer

⁶ The poverty estimates are based on URP monthly expenditure and do not include MDM expenditure as part of MPCE. Including the MDM expenditure, the poverty estimates are 24.2% (rural), 23.5% (urban) and 24.0 (all India). However, since the original Lakdawala estimates from planning commission were based on URP MPCE which did not include MDM expenditure, all comparisons are based on comparable URP poverty estimates excluding MDM expenditure.

price indices from the labour bureau to unit values implicit in the consumption expenditure surveys. The second major departure was the use of fisher indices which were rooted in current consumption pattern. In fact, the Tendulkar committee only made technical adjustments to correct the anomalies in use of price indices while retaining the urban poverty estimates of Lakdawala committee as the reference⁷. As a result of the change in methodology, the inflation implicit in Tendulkar poverty lines between 2004-05 and 2009-10 turn out to be 1.50 in rural areas and 1.49 in urban areas compared to 1.60 and 1.57 in rural and urban areas respectively by the Lakdawala methodology.

The difference in two inflation factors implicit in the Tendulkar poverty lines and the Lakdawala poverty lines is primarily because of the difference in weights used in the computation of the poverty lines. A large part of this is happening because the structure of basket has changed over the years with commodity groups such as food having much lower weight than what is implicit in the Lakdawala method. As against the food groups representing 80% of total consumption implicit in Lakdawala method, the Tendulkar poverty lines imply a food share of less than 60%. This has happened secularly over a period of time and the weights reflected in Tendulkar methodology are better reflection of the current consumption trends. A part of this is also due to the use of fisher indices by the Tendulkar method as against fixed weight of Lakdawala method. However, since Tendulkar committee poverty lines are based on fisher indices using current consumption pattern, they are sensitive to the use of the implicit unit values and the resulting commodity weights based on these prices. For example, the use of paid out prices of PDS items not only underestimates inflation for some of the commodity groups but also the actual consumption pattern involving these commodities. As a result, some of the change in commodity weights is also due to the fact that more people are purchasing from PDS in 2009-10 compared to earlier surveys. The share of different commodity weights in the consumption basket is important for inflation measurement particularly for items consumed through PDS since some of these items have seen the highest increase in market prices even though PDS prices on average have come down.

⁷ For details See Himanshu (2010)

Even though the Tendulkar poverty estimates appear robust in view of the corrections offered by the Tendulkar committee to the Lakdawala poverty lines, these do raise important questions on the dynamics of poverty reduction in a period of severe drought and unprecedented inflation particularly in food. Although the period after 2004-05 did witness an acceleration of growth rates to an average of 8.4% per annum between 2004-05 and 2009-10 from less than 6% per annum during the preceding five year period, it could be argued that the drought and the global recession make it less likely to cause a significant poverty reduction as seen during 2004-05 and 2009-10. It does appear that the adverse effect of these two external shocks on rural areas was less than earlier expected despite the fact that the 2009 drought was the worst in 30 years. Although this did not lead to an absolute decline in agricultural output, it did generate inflationary pressures that could have created distress. However, some of the distress that the drought and the recession could have caused was mitigated by other measures.

First, since recession restrained prices of manufactures, the inflation itself was accompanied by a significant movement of terms of trade in favour of agriculture. Secondly, the 66th round EUS also shows casual real wage rates growing at 4% per annum for rural males and 5% for rural females between 2005 and 2010, suggesting that those most vulnerable to inflation were now much better protected. The third defining feature of the 2004-05 to 2009-10 period has been the increase in social sector spending by the states as well as the central government. An obvious case of this is the MGNREGA. For example, with the 66th round showing an 8-fold increase in participation in public works over the 61st round and a doubling even compared to 64th round, the impact of MGNREGA is clearly visible. Recent research has confirmed the role of MGNREGA in not only influencing wage rates but also by creating employment opportunities in non-farm sector in rural areas. While MGNREGA was largely a central government led programme, state governments were seen as the primary catalyst as far as food related schemes are concerned. Most of the state governments expanded the scope of the existing programmes such as PDS and MDM by not only expanding coverage of households eligible for benefits but also by significantly reducing prices of essential cereals. More generally, the effects of the financial crisis were also muted because of the fiscal stimulus, which involved both a significant step-up in construction activity in the public sector and debt-relief for farmers. Taking into account that rural areas

also witnessed a significant flow of resources in the run up to the general elections in 2009, all these meant that the external shocks, although important, were not so severe as to re-create the earlier situation of sustained distress.

Seen in this backdrop, there does appear to be a *prima facie* case of growth contributing to the significant poverty reduction since 2004-05. This is also consistent with previous literature on poverty reduction where growth appears to be the primary driver of poverty reduction. However, a disaggregated analysis at state level also cautions at drawing such casual inference. While it is true that the aggregate growth rate accelerated during 2004-05 to 2009-10 compared to the period between 1993-94 and 2004-05, it is also true that the growth rate across states varied a great deal. In fact, the coefficient of variation of SDP across states does show an increase in the subsequent period. Notable feature of the growth rate after 2004-05 has been the emergence of the hitherto poorer states such as Bihar, Uttar Pradesh, Chhattisgarh and Orissa emerging as states with highest growth rates whereas the traditional drivers of growth such as the western and southern states have not seen any significant acceleration in growth rates in the latter period compared to the previous period. However, the extent of poverty reduction does not suggest any significant positive correlation between the state's growth rates and extent of poverty reduction. Barring Orissa which also shows a high reduction in poverty between 2004-05 and 2009-10, Bihar, Chhattisgarh and Uttar Pradesh are among the states with negligible poverty reduction with poverty actually increasing in case of Chhattisgarh. Most of these states are also states with very high concentration of poverty and the inability of growth to result in poverty reduction does raise a question on the transmission mechanism of growth in these states. While it is difficult to argue that growth did not play a role in the significant poverty reduction in a period of rising inequality and associated factors, it is also true that the role of transfers from the state was crucial not only in insulating the poorer households from external shocks but also in ensuring an increase in welfare of these households.

These were some of the issues that the analysis using official data should have provided. Unfortunately, this has not been possible either from the official agencies or from private researchers because of the criticisms that have been levelled against the official poverty measures. While the Tendulkar poverty lines appear robust compared to the Lakdawala

poverty lines in terms of its superiority in capturing the spatial and inter-temporal price differential, issues of robustness and comparability have also arisen in case of the official poverty lines issued by the planning commission on a completely different matter. This issue of treatment of in-kind transfers as well as valuation of implicit transfers from the state which have become more important since 2004-05 has already been raised with regard to the MDM expenditures. However, another issue that needs clarity is the issue of valuation of PDS items particularly after 2004-5 when there have been claims of PDS revival and its contribution to poverty reduction. In this regard, the current practice of valuing PDS consumption at paid out prices not only leads to an underestimation of the actual consumption of households on food and thereby total consumption expenditure even though the aggregate welfare may be better in terms of realised consumption, but also leads to problems of comparison since the Tendulkar lines are more sensitive to implicit transfers due to PDS and its impact on commodity weights.

As mentioned earlier, this issue of implicit in-kind food transfers as a result of government schemes such as the PDS and the MDM schemes has in any case arisen because the 2009-10 data includes MDM expenditure which were not included in the past. The inclusion of MDM expenditure as part of private household expenditure in 2009-10 consumption survey had the effect of increasing the MPCE and under-estimation of poverty using the official poverty lines based on Tendulkar method. It also lowers measured inequality since majority of the households who report MDM expenditure are concentrated at the bottom half of the distribution. A preliminary exercise using official poverty lines suggests that after exclusion of MDM expenditure from the total consumption expenditure of households, the actual poverty estimate for 2009-10 is 35.2% in rural areas, 21.5% in urban areas and 31.5% for all India as against the reported planning commission estimate of 33.3%, 20.9% and 29.9% for rural, urban and all India. That is, the real decline in poverty during 2004-05 and 2009-10 is only 6.63, 4.3 and 5.7 percentage points in rural, urban and all India as against reported estimates of 8.0, 4.8 and 7.4 percentage points by the planning commission. The inescapable conclusion even after this correction does remain that poverty has declined faster than it was declining in the previous period even though the extent of decline may have been overestimated by the planning commission. It also implies that the total number of poor in the country in 2009-10 was 373 million, 18 million more than the reported

estimate of 355 million for the country as a whole. That is, the number of poor people declined not by 52 million as reported by planning commission but only by 34 million.

In this context, the planning commission official view seems to be that it is necessary to include these because after all beneficiaries are getting these transfers which leads to welfare improvement. However, since this is also the case of many other transfers which lead to measured improvement, the issue of in-kind transfers need to be looked at carefully not only from the perspective of measurement of welfare and poverty but also comparability of poverty estimates over time since previous quinquennial surveys have not included any in-kind transfer as part of private household expenditure. Moreover, the issues are not only limited to in-kind transfers such as MDM but also PDS consumption which have the impact of lowered measured MPCE but higher consumer welfare as a result of transfers either as a result of lower prices for the commodities or expansion of the coverage and entitlement of the households of these commodities.

This paper is essentially about evaluating the impact of these transfers and its impact on welfare of households as measured by the poverty estimates. This is not only essential for a correct analysis of changes in poverty over time but also because these food based transfers have become important component of the “inclusive growth” strategy at a time when inequalities have continued to rise since the early 1990s. Decomposition of the changes in poverty is then as much an evaluation of the efficiency of these transfers as much as they are about the importance of these transfers to the welfare of households below the poverty line. However, this paper restricts itself to only the food based transfers without undermining the importance of other transfers. This is done by first evaluating the impact of these transfers on the simple poverty measures such as head count ratios (HCR) but also on distribution sensitive measures such as depth of poverty (Poverty gap) and severity of poverty (squared poverty gap). This is followed by a decomposition of the poverty change into various components, in particular growth and the transfers.

Food Based Transfers and Poverty Estimates

The case of MDM is relatively easier to understand since it is a zero price transfer. It does not involve any out-of-pocket (OOP) expenditure. The NSS has started imputing these and adding to OOP expenditure since the 64th round⁸. Prior to that, any in-kind transfer not involving out-of-pocket expenditure was not included as part of consumption expenditure. There is, however, merit in the argument that in-kind transfers such as MDM do improve welfare of recipients. Therefore, evaluation of the in-kind transfers on poverty would be an important component of poverty reduction. However, since MDM expenditures were not included in any of the surveys before 2009-10, the inclusion of this item of expenditure in 2009-10 also implies that the poverty estimates based on the consumption expenditure including these is not comparable to the estimates of poverty for earlier years. Nonetheless, since these are now available as part of the consumption expenditure schedule in 2009-10, it also offers an opportunity to look at the impact of these on the welfare of households that benefit from this transfer.

One way of maintaining comparability of poverty estimates in view of the inclusion of MDM expenditure in 2009-10 is to exclude the component of MDM expenditure from the 2009-10 consumption expenditure. As reported earlier, these lead to comparable estimates which suggest lower poverty reduction than the official estimates from the planning commission. However, since these do raise questions on welfare implications of the MDM transfers on poverty measures, a better way is to keep the MDM expenditure as part of consumption expenditure. While this can easily be done for 2009-10 where this item has been explicitly included, there are problems of quantifying these in-kind transfers for previous years for comparison purposes. Fortunately, there is some information on the free meals received by households from the employers or from schools and balwadis. This information which is

⁸ The details and the rationale of shifting to a different concept of consumption expenditure is available in the instruction manuals for the 64th round as well as the 66th round. According to the NSSO, since the 64th round the NSSO has shifted to a mixed concept of consumption which includes 1) Use Approach, 2) the First Use Approach, and 3) the Expenditure Approach. The justification of including MDM expenditure as part of MPCE is based on the "Use Approach" since the household members are consuming these food and therefore used by the household. Previously, this was not included based on "expenditure approach" since the households did not make any expenditure on receiving the free food. While MDM expenditure has been recorded as a separate item of expenditure (item 302), it is not clear whether the same rule was applied to other free benefits such as school uniforms, textbooks, medicines and so on.

collected as part of the demographic block has the question on number of meals received by the household free-of-cost from a school or balwadi. Since this information was retained in 2009-10, it is useful to begin by looking at the estimates of meals consumed from the demographic block and those from the consumption block. Table 1 gives the average number of meals consumed reported by the households from these two sources.

These estimates from the two sources are fairly close to each other not only at the national level but also at state level. Since the estimate on number of meals consumed is also available in previous rounds, it is possible to calculate the consumption expenditure of households including free school meals. Unfortunately, there is no information on value of these school meals in previous surveys. However, since the 2009-10 survey gives the prices of school meals and meals purchased by the households, it is possible to impute the values of school meals in other rounds with the assumption that the ratio of market purchased meal and school meal would not change over time⁹. The school meals consumed by each of the households were thus valued at the prices as a constant ratio of the meals purchased in each state and sector. These can then be added to the private MPCE to arrive at a comparable estimate of MPCE including school meals.

While this takes care of the comparability problem as far as MDM expenditure is concerned, the issue of implicit transfers from the PDS are complicated. In the case of PDS, the practice has been to value PDS at prices paid by the consumers and other purchases at their relevant market prices again retaining the concept of Out of Pocket (OOP) expenditure. The extent to which the benefits of PDS in-kind transfers are captured can then be measured as the differential of the prices paid by consumers at PDS stores and the implicit market prices of the commodities consumed. While this can give an estimate of absolute value of transfers received by the households for the commodities consumed from PDS, it may not be useful to treat these adjusted MPCE for poverty comparison. Since currently, the Tendulkar method does not value the PDS consumption at market prices but at paid out prices,

⁹ NSS consumption surveys have always included an item on the number of meals purchased by the households. This information is available not only for the number of meals consumed but also the imputed value of meals consumed. Using the per unit cost of a meal for purchased meals in 2009-10 and free meals in schools in 2009-10, free meals consumed in other rounds were valued as a constant ratio of the purchased meal unit values.

poverty estimates based on Tendulkar method do not allow any measurement of in-kind transfer for PDS items.

Table 1: Tendulkar Poverty Lines adjusted for PDS commodities

| | 1993-94 | | 2004-05 | | 2009-10 | |
|-------------------|---------|-------|---------|-------|---------|--------|
| | Rural | Urban | Rural | Urban | Rural | Urban |
| Andhra Pradesh | 251.6 | 288.1 | 443.0 | 563.6 | 741.1 | 960.0 |
| Arunachal Pradesh | 288.3 | 330.7 | 547.1 | 618.5 | 797.1 | 970.4 |
| Assam | 267.8 | 312.7 | 478.3 | 600.0 | 710.0 | 878.9 |
| Bihar | 237.4 | 268.4 | 434.0 | 526.2 | 661.6 | 779.0 |
| Chhattisgarh | 231.1 | 285.3 | 406.6 | 513.7 | 686.1 | 838.7 |
| Delhi | 319.2 | 327.1 | 543.2 | 643.2 | 769.6 | 1044.0 |
| Goa | 326.7 | 314.0 | 608.8 | 673.8 | 947.6 | 1043.7 |
| Gujarat | 284.7 | 322.9 | 505.8 | 659.2 | 742.8 | 957.2 |
| Haryana | 295.3 | 312.4 | 529.4 | 626.7 | 798.4 | 980.3 |
| Himachal Pradesh | 276.5 | 318.4 | 536.1 | 608.7 | 746.0 | 917.1 |
| Jammu & Kashmir | 291.0 | 285.7 | 535.3 | 624.0 | 766.9 | 911.9 |
| Jharkhand | 229.7 | 306.1 | 406.7 | 531.4 | 637.8 | 836.9 |
| Karnataka | 272.0 | 301.4 | 446.1 | 589.3 | 674.2 | 930.7 |
| Kerala | 294.5 | 297.3 | 540.7 | 587.5 | 801.4 | 847.7 |
| Madhya Pradesh | 234.7 | 277.3 | 414.0 | 532.3 | 654.0 | 782.6 |
| Maharashtra | 270.2 | 330.0 | 491.0 | 633.2 | 767.8 | 967.6 |
| Manipur | 322.3 | 366.3 | 578.1 | 641.1 | 875.1 | 960.5 |
| Meghalaya | 286.6 | 399.9 | 514.2 | 745.7 | 714.7 | 1000.6 |
| Mizoram | 325.0 | 370.9 | 653.8 | 711.3 | 894.9 | 976.3 |
| Nagaland | 381.7 | 412.4 | 687.3 | 782.9 | 1016.8 | 1147.6 |
| Orissa | 225.7 | 282.3 | 407.8 | 497.3 | 605.4 | 757.2 |
| Pondicherry | 221.6 | 269.9 | 415.7 | 506.2 | 683.3 | 795.7 |
| Punjab | 288.2 | 343.0 | 543.5 | 642.5 | 838.8 | 966.8 |
| Rajasthan | 272.8 | 301.4 | 478.6 | 568.2 | 761.2 | 851.5 |
| Sikkim | 267.9 | 366.1 | 540.3 | 741.7 | 767.4 | 1038.5 |
| Tamil Nadu | 260.6 | 299.2 | 485.2 | 576.2 | 725.4 | 865.6 |
| Tripura | 284.4 | 322.2 | 461.3 | 558.7 | 696.8 | 815.8 |
| Uttar Pradesh | 244.4 | 283.1 | 435.5 | 532.1 | 674.2 | 807.5 |
| Uttaranchal | 254.5 | 310.1 | 491.4 | 604.9 | 739.2 | 907.2 |
| West Bengal | 236.9 | 299.8 | 445.7 | 572.7 | 656.1 | 836.2 |

However, a suitable modification of the Tendulkar poverty lines is possible to measure the impact of in-kind transfers. This can be done by raising the poverty line to the extent to which the cost of bundle actually consumed in any month would thereby increase because it is now valued at market prices. Since the Tendulkar poverty lines use unit values as implicit prices, this can easily be done by replacing the value of consumption of PDS items by state, sector and consumption classes by their appropriate market prices. A minor adjustment is

also required in determining the poverty line class since the consumption aggregates and the corresponding commodity weights also change if PDS items are valued at market prices rather than paid-out prices. This has been done by replacing the value of consumption of items consumed through the PDS by revaluing them at market prices. Table 1 gives the new poverty lines adjusted by valuing PDS items at respective market prices instead of paid out prices.

Since the purpose of this paper is to look at in-kind transfers and implicit transfers such as PDS on food consumption and poverty, this adjustment has only been done for rice, wheat and sugar and not for kerosene. However, the adjustment in the poverty lines to take care of PDS items should ideally leave the poverty estimates unchanged if the same procedure is applied to the household consumption expenditure. That is, these adjusted poverty lines applied on MPCE adjusted for PDS prices should ideally give the same poverty estimates as is obtained by using the official poverty lines on unadjusted MPCE. Accordingly, revaluation of consumption expenditure was also done to take care of the MDM expenditure and PDS items¹⁰. There are then four different estimate of MPCE that can be computed for each of the survey rounds comparable to each other. These are MPCEMRP (only out of pocket expenditure), MPCE_MDM (out of pocket expenditure plus imputed value of free school meals), MPCE_PDS (out of pocket expenditure for all items except for PDS for which market prices have been used instead of OOP expenditure) and finally MPCE_PDS_MDM (MPCE_PDS plus the value of school meals). The first estimate, MPCEMRP is the one which has been used so far officially in Tendulkar poverty estimates except that it does not include MDM expenditure in 2009-10. Accordingly four different estimates of poverty and related measures are available for the three rounds comparable to each other. Table 2 summarises the estimates at all India level.

¹⁰ For MDM expenditure, the procedure of assigning implicit welfare gain due to free meals from the school has already been explained earlier. For the purpose of PDS transfers, the adjustment has been made according to the following procedure. For those households who consume from the PDS as well as from the market, the market price used to revalue PDS consumption has been the market price of the purchased commodity. For those households where there is no market purchase but they have consumed out of home produce, the price taken is the implicit price assigned by the NSSO for home produced consumption. For those households where the PDS consumption has been only from the PDS with no other source of consumption, the price used for imputing market price is to take the median expenditure of all households who have consumed out of the market in the district.

Of these four measures of consumption expenditure, the MPCEMRP is the MRP measure as reported in the NSS surveys and its reports. This in fact is the measure of MPCE that has been used for poverty estimation by the Tendulkar committee official estimates and corresponds to a measure based entirely on reported out of pocket expenditure by the households. However, these are different in the case of 2009-10 because these do not include the expenditure on MDM from the consumption expenditure. Official measures of poverty reported by the Tendulkar committee are based on this measure only except for 2009-10 wherein they have been applied on MPCE_MDM which includes MDM expenditure.

Table 2: HCR, PG and SPG by different measures of MPCE

| | MPCEMRP | | | MPCE_MDM | | |
|------------|----------|-------|-------|--------------|-------|-------|
| | Rural | Urban | Total | Rural | Urban | Total |
| HCR | | | | | | |
| 1993-94 | 51.11 | 32.56 | 46.25 | 50.94 | 32.37 | 46.07 |
| 2004-05 | 43.29 | 25.80 | 38.22 | 41.78 | 25.23 | 36.98 |
| 2009-10 | 38.82 | 22.60 | 33.85 | 36.93 | 22.04 | 32.36 |
| PG | | | | | | |
| 1993-94 | 12.77 | 7.79 | 11.46 | 12.66 | 7.72 | 11.36 |
| 2004-05 | 9.69 | 5.81 | 8.57 | 9.03 | 5.51 | 8.01 |
| 2009-10 | 8.65 | 5.13 | 7.57 | 7.87 | 4.82 | 6.94 |
| SPG | | | | | | |
| 1993-94 | 4.49 | 2.72 | 4.02 | 4.43 | 2.69 | 3.97 |
| 2004-05 | 3.10 | 1.89 | 2.75 | 2.80 | 1.74 | 2.50 |
| 2009-10 | 2.79 | 1.71 | 2.46 | 2.44 | 1.55 | 2.17 |
| | MPCE_PDS | | | MPCE_PDS_MDM | | |
| | Rural | Urban | Total | Rural | Urban | Total |
| HCR | | | | | | |
| 1993-94 | 50.18 | 31.50 | 45.28 | 49.99 | 31.32 | 45.09 |
| 2004-05 | 41.89 | 25.01 | 36.99 | 40.29 | 24.42 | 35.69 |
| 2009-10 | 35.34 | 20.85 | 30.89 | 33.57 | 20.24 | 29.48 |
| PG | | | | | | |
| 1993-94 | 12.33 | 7.42 | 11.04 | 12.23 | 7.35 | 10.95 |
| 2004-05 | 9.09 | 5.51 | 8.05 | 8.46 | 5.22 | 7.52 |
| 2009-10 | 7.28 | 4.50 | 6.42 | 6.57 | 4.23 | 5.85 |
| SPG | | | | | | |
| 1993-94 | 4.29 | 2.56 | 3.83 | 4.23 | 2.53 | 3.78 |
| 2004-05 | 2.84 | 1.75 | 2.52 | 2.57 | 1.62 | 2.29 |
| 2009-10 | 2.19 | 1.44 | 1.96 | 1.91 | 1.30 | 1.72 |

However, the poverty estimates reported here are based on the adjusted poverty line and therefore not strictly comparable to the official poverty estimates. The comparable

estimates of poverty using these poverty lines are the estimates reported by applying the adjusted poverty lines of MPCE_PDS since these correspond to the same treatment of PDS goods in the poverty line as well as MPCE. This is expected since the adjustment in PDS prices in the poverty line leaves the poverty estimates unchanged after these are also adjusted for the household consumption expenditure. This broad result also confirms the robustness of the procedure for correction of poverty lines for PDS prices. While this is true for 1993-94 and 2004-05 with the poverty estimates applied on MPCE_PDS, the official poverty estimates are different in case of 2009-10. The official estimates of poverty in fact correspond to the estimates of poverty when these poverty lines are applied to MPCE_PDS_MDM. It is primarily because of this use of different sets of MPCE measures that renders the 2009-10 estimates incomparable to the earlier estimates of 2004-05 and 1993-94. The measure of MPCE_PDS_MDM is an entirely synthetic construct taking into account the direct transfers due to MDM along with implicit transfers from the PDS.

Since the MPCE estimates based on MPCE_PDS_MDM concept also include the implicit transfers as part of household consumption expenditure, these also show the lowest estimate of poverty among the four estimates. On the other hand, the MPCEMRP concept of MPCE which is based on the OOP principle shows the highest poverty incidence for any year. The difference between these two estimates for any survey year can be treated as the benefit incidence of PDS and MDM. In between these two extremes are the two estimates of MPCE_MDM and MPCE_PDS which are derived MPCE aggregates by including only one kind of income transfers, that is only MDM in case of MPCE_MDM and only PDS in case of MPCE_PDS. The difference between these estimates and the MPCEMRP estimates give the impact of these transfers on poverty estimates in any survey year. Difference in the poverty estimates in a particular survey year will also allow us to quantify the impact of these transfers alone or together to poverty incidence.

As far as the impact of MDM is concerned, this is simply the incidence of poverty without accounting for free transfers from MDM compared to the poverty estimate when these are added as part of household expenditure. The incremental impact of MDM was only 0.2 % in 1993-94 but increased to 1.2% by 2004-05 after a significant expansion of the MDM in 2001

and 2002¹¹. In 2009-10, inclusion of MDM expenditure alone accounted for 1.5% lower poverty estimate, marginally higher than 2004-05. This was more in the case of rural areas where poverty was lower after inclusion of MDM expenditure alone by 1.9% in 2009-10 whereas it was only 0.6% in urban areas. While this partially reflects the overwhelming percentage of children who use public educational institutions in rural areas compared to urban areas, it is also because of significant expansion in the amount of benefit received by children and the expansion of coverage to upper primary schools.

However, there are large variations across states as far as impact of MDM meals is concerned. As far as MDM is concerned, very few states had MDM programmes in 1993-94. At the all India level, impact of MDM was only 0.18, 0.19 and 0.18 in rural, urban and all areas in 1993-94. Among states only Tamil Nadu and Pondicherry show lower poverty at 1.85% and 1.22% respectively in 1993-94 after inclusion of imputed value of school meals. For most other states, the imputation of value of school meals has no impact on poverty estimates. It is only in 2004-05 that the MDM transfers show some impact of MDM transfers after expansion in 2001. At the all India level it is 1.51% in rural areas, 0.57% in urban areas and 1.23% for all areas. Across states, other than Tamil Nadu, states which show lower poverty estimates after imputation of free school meals are Andhra (1.69%), Chhattisgarh (5.76%), Himachal Pradesh (2.99%), Karnataka (2.33%), Madhya Pradesh (1.81%), Maharashtra (1.36%), Orissa (1.04%) and Uttaranchal (3.01%). After 2004-05, not only has there been an expansion in terms of coverage but also the access in some of the poorest states has increased. By 2009-10, the imputation of MDM meals accounts for lower poverty by 1.89% in rural areas, 0.56% in urban areas and 1.48% for all areas. Other than the states where MDM transfer was significant in terms of poverty in 2004-05 and 1993-94, Gujarat, Orissa and West Bengal were also states where the income transfer from MDM was significant (around 2%) in 2009-10.

¹¹ The mid-day-meal programme originally existed in very few states. While Tamil Nadu is the pioneer of the MDM scheme having been initiated at the state level in 1982 by MGR, the programme also existed at a smaller level in Gujarat and Pondicherry. It was officially launched as a national nutrition programme in August 1995. It was made universal following Supreme Court order in 2001 and was further expanded in 2002 and in 2004. It was extended to upper primary school children in 2007 and was further expanded in 2009. 8.41 crore primary children and 3.36 crore upper primary children (total of 11.77 crore) were estimated to have benefited from MDM Scheme during 2009-10.

However, unlike the MDM which did not exist before 1995, PDS has been in operation for a far longer period. However, it has also seen significant changes in the nature of the PDS both in terms of access by the households, prices paid for PDS items as well as the coverage of the commodities. For simplicity and comparability purposes, we have only included food items covered by the PDS even for the earlier years. That is, the PDS adjustment in 1993-94 is only for items received from the PDS for rice, wheat and sugar. Adjusted for PDS transfers only, poverty estimates were lower by 0.97% in 1993-94, 1.22% in 2004-05 and 2.95% in 2009-10 for all India for all sectors. These were 0.94 and 1.06 in rural and urban respectively in 1993-94 reflecting the urban bias in the PDS before it was targeted. By 2004-05, this was reversed with poverty estimates lower after PDS transfers by 1.40% and 0.79% in rural and urban areas respectively. By 2009-10, the poverty estimates were lower in rural areas after PDS transfers by 3.49% in rural areas and 1.75% in urban areas. In 1993-94, when PDS was universal, the impact on poverty HCR was significant in the case of Andhra Pradesh (2.66%), Kerala (2.65%) and Tamil Nadu (2.73%) among the major states. This was almost negligible in the case of most of the poorer states such as Bihar, Jharkhand, Madhya Pradesh, Uttar Pradesh, Chhattisgarh and Orissa. However, after the introduction of TPDS, there has been a shift in income transfers towards households at the bottom of the distribution and also the bias shifted away from urban areas to rural areas. By 2004-05, states which show significant impact on poverty HCR along with the states mentioned earlier were Chhattisgarh, Himachal Pradesh and Karnataka. For majority of the states, the impact was higher compared to 1993-94 with highest impact in Tamil Nadu which had poverty lower by 6.39% in 2004-05 after adjusting for income transfer due to PDS. The situation dramatically improves in 2009-10 with many other states joining these states where PDS transfers were having an impact on population below poverty line. Orissa, Maharashtra and Madhya Pradesh were states which saw significant improvement in the impact of PDS by 2009-10. Orissa and Chhattisgarh along with Tamil Nadu and Andhra Pradesh were states where the adjustment of PDS transfers had the impact of more than 6% population being counted as non-poor compared to using only OOP expenditure.

As far as inter-temporal changes in poverty are concerned, the record is at best mixed. Table 3 gives the annual percentage point decline in poverty HCR, PG and SPG for the four measures for 1993-94, 2004-05 and 2009-10. At the all India level, comparing only OOP

expenditure, poverty reduction between 2004-05 and 2009-10 is about 4.35 percentage points (4.46 rural and 3.17 urban) as against 6.19 percentage points (6.72 rural and 4.16 urban) when implicit transfers are included as part of the expenditure. While this is still higher on annual basis compared to the poverty reduction between 1993-94 and 2004-05 (based on OOP expenditure it is 7.82 rural, 6.78 urban and 8.04 for all India and 9.69 rural, 6.92 urban and 9.41 for all India after including the implicit transfers), it is also clear that a significant part of the reduction between 2004-05 and 2009-10 is due to the increase transfers due to PDS. This occurs throughout the country but is particularly large not only in states where PDS has traditionally been strong such as Tamil Nadu, Andhra Pradesh, Himachal Pradesh and Karnataka but also in states like Orissa and Chhattisgarh.

Table 3: Percentage point decline per annum in various measures of poverty

| | MPCEMRP | | | MPCE_MDM | | |
|--------------------|-----------------|--------------|--------------|---------------------|--------------|--------------|
| | Rural | Urban | Total | Rural | Urban | Total |
| HCR | | | | | | |
| 1993-94 to 2004-05 | 0.71 | 0.62 | 0.73 | 0.83 | 0.65 | 0.83 |
| 2004-05 to 2009-10 | 0.89 | 0.64 | 0.87 | 0.97 | 0.64 | 0.92 |
| PG | | | | | | |
| 1993-94 to 2004-05 | 0.28 | 0.18 | 0.26 | 0.33 | 0.20 | 0.30 |
| 2004-05 to 2009-10 | 0.21 | 0.14 | 0.20 | 0.23 | 0.14 | 0.21 |
| SPG | | | | | | |
| 1993-94 to 2004-05 | 0.13 | 0.08 | 0.12 | 0.15 | 0.09 | 0.13 |
| 2004-05 to 2009-10 | 0.06 | 0.04 | 0.06 | 0.07 | 0.04 | 0.07 |
| | MPCE_PDS | | | MPCE_PDS_MDM | | |
| | Rural | Urban | Total | Rural | Urban | Total |
| HCR | | | | | | |
| 1993-94 to 2004-05 | 0.75 | 0.59 | 0.75 | 0.88 | 0.63 | 0.86 |
| 2004-05 to 2009-10 | 1.31 | 0.83 | 1.22 | 1.31 | 0.83 | 1.22 |
| PG | | | | | | |
| 1993-94 to 2004-05 | 0.29 | 0.17 | 0.27 | 0.34 | 0.19 | 0.31 |
| 2004-05 to 2009-10 | 0.36 | 0.20 | 0.33 | 0.38 | 0.20 | 0.33 |
| SPG | | | | | | |
| 1993-94 to 2004-05 | 0.13 | 0.07 | 0.12 | 0.15 | 0.08 | 0.14 |
| 2004-05 to 2009-10 | 0.13 | 0.06 | 0.11 | 0.13 | 0.06 | 0.11 |

While this is clearly evident in case of HCR, distribution sensitive measures such as poverty gap and squared poverty gap suggest opposite trend on all measures except for MPCE_PDS where the annual rate of reduction during 2004-05 and 2009-10 is better than the annual

rate of reduction between 1993-94 and 2004-05. In fact, except for the poverty gap estimates based on MPCE_PDS_MDM, per annum decline is lower during the latter period for poverty gap measures as well as squared poverty gap measures by all four measures of MPCE. In fact, this result of worsening of performance by the higher order measures of poverty is evident irrespective of poverty line used and MPCE measure used¹². This result which has largely remained unnoticed in the euphoria of higher poverty reduction on the basis of HCR measures also appears muted using unadjusted poverty measure because of the impact of PDS transfers. Netting out the impact of PDS transfers, the results suggest that the annual rate of reduction almost halved for the higher order measures of poverty based only on out of pocket expenditure. Clearly, the improved performance of PDS not only resulted in better performance in terms of number of people who came out of poverty but more so in terms of their distance from the poverty line. However, even after including the implicit transfers in the consumption expenditure the percentage point annual reduction after 2004-05 is lower than the annual reduction in squared poverty gap during 1993-94 and 2004-05 with the adjusted poverty line measure.

A Decomposition Exercise

A better way of understanding the relative contribution of the PDS and MDM is to decompose the poverty decline in various components. This can be easily done using the different estimates reported earlier. While the difference in poverty estimates based on OOP expenditure alone is simply the growth contribution to poverty reduction, the reduction in poverty decline due to MDM and PDS is simply the difference in poverty estimates after including these transfers¹³. Table 4 gives the results of a decomposition exercise based on the estimates reported above.

¹² In fact, using official poverty lines on comparable MPCE measure also gives similar results. While poverty HCR declined at the annual rate of 1.25 percentage points per annum for all India (1.32 in rural and 0.86 in urban) during 2004-05 and 2009-10, it was higher than the corresponding decline of 0.71 percentage points per annum for all India (0.75 rural and 0.54 urban) during 1993-94 and 2004-05. However, for the squared poverty gap measure, percentage point decline per annum between 2004-05 and 2009-10 at 0.10 for all India, 0.11 for rural and 0.06 for urban was lower than the corresponding decline during 1993-94 and 2004-05 at 0.11 for all India, 0.13 for rural and 0.07 for urban areas. The trends are similar even if one uses the Lakdawala poverty estimates where all three measures show lower annual reduction after 2004-05 compared to the decade before that.

¹³ Growth here represents the residual component after netting out the impact of PDS and MDM. However; it is fair to say that even the growth component includes the contribution of public programmes such as

As is evident from table 4, while growth contributed more than 80% in rural areas as far as poverty reduction between 1993-94 and 2004-05 is concerned, it was almost overwhelmingly the case in urban areas with more than 90% of the poverty reduction being contributed by growth alone.

Table 4: Decomposition of poverty reduction

| | 1993-94 to 2004-05 | | | | 2004-05 to 2009-10 | | | |
|-----------------------|--------------------|-------|-------|-------|--------------------|-------|-------|-------|
| | Growth | PDS | MDM | Total | Growth | PDS | MDM | Total |
| HCR | | | | | | | | |
| Rural | -0.71 | -0.04 | -0.13 | -0.88 | -0.89 | -0.42 | -0.03 | -1.34 |
| Urban | -0.62 | 0.03 | -0.04 | -0.63 | -0.64 | -0.19 | -0.01 | -0.84 |
| Total | -0.73 | -0.02 | -0.10 | -0.85 | -0.87 | -0.35 | -0.02 | -1.24 |
| PG | | | | | | | | |
| Rural | -0.28 | -0.02 | -0.05 | -0.34 | -0.21 | -0.15 | -0.01 | -0.38 |
| Urban | -0.18 | 0.01 | -0.02 | -0.19 | -0.14 | -0.06 | 0.00 | -0.20 |
| Total | -0.26 | -0.01 | -0.04 | -0.31 | -0.20 | -0.13 | -0.01 | -0.33 |
| SPG | | | | | | | | |
| Rural | -0.13 | -0.01 | -0.02 | -0.15 | -0.06 | -0.07 | 0.00 | -0.13 |
| Urban | -0.08 | 0.00 | -0.01 | -0.08 | -0.04 | -0.03 | 0.00 | -0.06 |
| Total | -0.12 | 0.00 | -0.02 | -0.14 | -0.06 | -0.05 | 0.00 | -0.11 |
| In percentages | | | | | | | | |
| HCR | | | | | | | | |
| Rural | 80.7 | 4.8 | 14.5 | 100 | 66.4 | 31.1 | 2.5 | 100 |
| Urban | 98.1 | -4.0 | 5.9 | 100 | 76.4 | 23.0 | 0.6 | 100 |
| Total | 85.4 | 2.7 | 11.9 | 100 | 70.4 | 27.9 | 1.8 | 100 |
| PG | | | | | | | | |
| Rural | 81.5 | 4.5 | 14.0 | 100 | 55.2 | 41.0 | 3.8 | 100 |
| Urban | 93.1 | -3.1 | 10.0 | 100 | 68.9 | 32.3 | -1.2 | 100 |
| Total | 84.4 | 2.9 | 12.7 | 100 | 59.9 | 37.8 | 2.4 | 100 |
| SPG | | | | | | | | |
| Rural | 83.4 | 3.8 | 12.8 | 100 | 47.2 | 49.8 | 3.0 | 100 |
| Urban | 91.5 | -2.5 | 11.1 | 100 | 58.4 | 41.0 | 0.6 | 100 |
| Total | 85.5 | 2.5 | 12.0 | 100 | 51.4 | 46.5 | 2.1 | 100 |

While the contribution of PDS was positive and less than 5% in rural areas it was actually negative in urban areas as a result of the reversal of the urban bias in PDS that existed before introduction of TPDS. However, MDM did contribute between 10 to 15%. While growth continues to remain important for poverty reduction after 2004-05, it is less so with

MGNREGA and other transfers from the government. Further decomposition of the growth component has not been attempted here but should be an agenda of research in future.

the relative contribution in rural areas at 66.4% and 76.2% in urban areas. Even though, in percentage terms the contribution of PDS and MDM is almost one third after 2004-05, it is important to note that in absolute terms they are almost half of the total annual decline based on growth alone.

A peculiar aspect of the poverty decline after 2004-05 is also that the relative contribution also declines as we move to distribution sensitive measures such as poverty gap and squared poverty gap. Growth alone accounted for less than 50% of total poverty reduction after 2004-05 in rural areas and around 58% in urban areas. The incremental impact of MDM is also negligible after 2004-05. The important finding from this analysis is the emergence of PDS as a significant contributor of poverty reduction. While its contribution was only 31% in rural areas and 23 % in urban areas, its contribution to reduction in poverty gap was 41% in rural areas, 32.5% in urban areas and 37.8% for the country as a whole. For squared poverty gap measures, it was the dominant contributor in rural areas accounting for almost half of total reduction in squared poverty gap after 2004-05 but was lower at 41.3% in urban areas. It is also worth noting that in terms of absolute contribution of growth as far as higher order measures are concerned, there is a clear decline after 2004-05 compared to the decade before that. For the squared poverty gap, the contribution of PDS in rural areas outweighs the contribution of growth alone. A significant part of the explanation of the poverty reduction after 2004-05 does point to the fact that PDS came in to check what would have happened because of drought and recession. Our estimates suggest that 35 million more people would have been poor and the SPG would have been roughly a third higher.

While it is obvious that the expansion of the PDS and MDM explain a large and significant part of the reduction in poverty after 2004-05, growth continues to be important with roughly two thirds of poverty reduction being explained by the growth component alone. At the same time, it is also obvious that a large part of this growth was also driven by direct spending by the government in the form of increased allocation for employment generation programmes but also indirectly through increase in MSP and so on. Nonetheless, the fact that PDS alone accounted for half of reduction in squared poverty gap in rural areas and almost two fifth in urban areas should be seen as the example of redistributive policies in

poverty reduction. The fact that these benefits are far more evident in case of distribution sensitive measures such as poverty gap and squared poverty gap also implies a better access by the disadvantaged households and poorer households to the PDS.

Is PDS efficient?

An important issue then is whether PDS has been instrumental in improving welfare of the population, particularly those at the bottom of the distribution and if so then what is contribution of these in total poverty reduction. However, given the fact that the PDS has come into criticism, at least recently, on account of its leakages, an issue that needs to be investigated is also whether it is efficient in terms of delivering to the poor. Preliminary analysis presented above is clear that on this count PDS does contribute to poverty reduction and its performance has improved significantly after 2004-05. Nonetheless, its performance has varied over the years with very little contribution of the PDS in 1993-94 to improved access and benefit to the poor after TPDS. However, although its impact in terms of distribution sensitive measures did improve after TPDS including the reversal of the earlier trend of urban bias, its impact increased significantly after 2004-05. This was not only in terms of access by the poorer households but also the quantum of transfer received which is reflected in the decomposition of poverty gap and squared poverty gap.

The story of revival of PDS after 2004-05 is now evident from many sources. Field surveys conducted by Dreze and Khera have shown very low levels of leakages both in terms of prices paid as well as quantum of food grains received¹⁴. This was also brought out in our earlier paper (Himanshu and Sen, 2011) which reported distinct improvement in PDS performance using data up to 2007-08. The 2009-10 data also confirms the trend of improvement in PDS functioning. This is not only restricted to states which were doing better historically such as the southern states of Tamil Nadu, Karnataka and Andhra Pradesh along with Himachal Pradesh but is now seen across all states. However some of the largest improvements have been seen in the poorer states such as Chhattisgarh and Orissa but also in Madhya Pradesh, Maharashtra and Uttar Pradesh. In most of the states, the strategy has

¹⁴ For details see Khera (2011)

been two fold, expansion of coverage to near universal access and reduction in PDS prices for rice and wheat. As of now, rice and wheat are sold at prices below the proposed price of Rs 2 per Kg for wheat and Rs 3 per Kg for rice in 15 states. Both these measures also had the immediate impact of reduction in leakages in the PDS by 2009-10. The improvement in case of rice is much more pronounced than in the case of wheat also because most of the states which introduced these reforms were primarily rice consuming states. The leakage in case of rice which had increased from a low of 19% in 1993-94 to 40% in 2004-05 came down to 25% by 2009-10. In case of wheat, leakages increased from 41% in 1993-94 to 73% in 2004-05 before coming down to 59% in 2009-10. However, it is still a matter of concern that 40% of food grains were unaccounted for even in 2009-10 even though it has come down from a high of 54% in 2004-05.

Table 5: Leakages in PDS

| | 1993-94 | 2004-05 | 2009-10 |
|-------|---------|---------|---------|
| Rice | 19 | 40 | 25 |
| Wheat | 41 | 73 | 59 |
| Total | 28 | 54 | 40 |

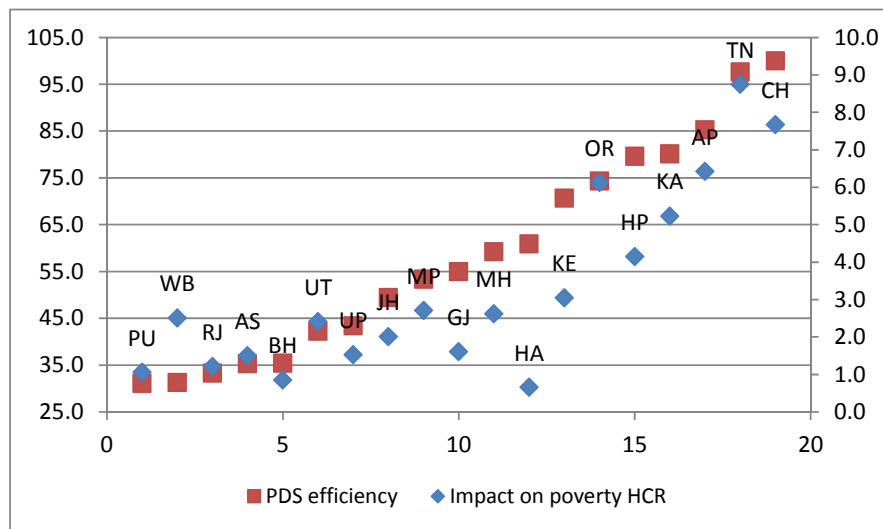
(Difference between consumption reported by NSS and official Off-take from FCI)

Table 6: state wise leakages in PDS and change in HCR due to PDS transfers (2009-10)

| | Leakages (2009-10) | Impact on poverty HCR |
|--------------------|--------------------|-----------------------|
| Andhra Pradesh | 14.7 | 6.4 |
| Assam | 64.8 | 1.5 |
| Bihar | 64.6 | 0.9 |
| Chhattisgarh | 0 | 7.7 |
| Gujrat | 45.1 | 1.6 |
| Haryana | 39.1 | 0.7 |
| Himachal Pradesh | 20.4 | 4.1 |
| Jharkhand | 50.6 | 2.0 |
| Karnataka | 19.9 | 5.2 |
| Kerala | 29.3 | 3.0 |
| Madhya Pradesh | 46.6 | 2.7 |
| Maharastra | 40.8 | 2.6 |
| Orissa | 25.7 | 6.1 |
| Punjab | 68.9 | 1.1 |
| Rajasthan | 66.7 | 1.2 |
| Tamil Nadu | 2.4 | 8.7 |
| Uttar Pradesh | 56.6 | 1.5 |
| Uttaranchal | 57.8 | 2.4 |
| West Bengal | 68.7 | 2.5 |
| Correlation= -0.88 | | |

While this was visible in almost all states, it was particularly sharp in case of Chhattisgarh and Orissa along with Tamil Nadu, Andhra Pradesh, Karnataka and Himachal Pradesh which have historically have low leakages in the PDS. These incidentally are also the states which have the highest impact of PDS transfers on poverty. This is true for the simple measure of HCR as well as distribution sensitive measures of poverty gap and squared poverty gap. Table 6 gives the extent of leakages in these states in 2009-10 and the change in poverty estimates when the PDS transfers are included in the consumption expenditure. Chart 1 gives the scatter of the same.

Chart 1: scatter of PDS efficiency and impact on poverty HCR



While these two measures did have an impact on efficiency of the PDS, it was also a combination of other factors including streamlining of distribution mechanism, de-privatisation of FPS and use of technology for tracking movement of grains as well as monitoring and evaluation systems. The combined effect of these was a higher off-take by the households at the bottom of the distribution. While this was seen in case of all states it was particularly significant in states mentioned as better performing states¹⁵. At the all India

¹⁵ For example, percentage of households in rural areas purchasing in Chhattisgarh from PDS went up from 10.6% in 1993-94, 25.7% in 2004-05 to 66.3% in 2009-10. For Orissa, it was 5% in 1993-94, 20.6% in 2004-05 and 59.1% in 2009-10. For Madhya Pradesh it went up from 10.8% in 1993-94, 23.5% in 2004-05 to 47.3% in 2009-10. This was also the case in many other states other than Tamil Nadu, Andhra, Karnataka and Himachal Pradesh where the percentage of households purchasing from PDS has been very high (more than 75%). For example, West Bengal also saw PDS purchase increase from 10.7% in 1993-94 to 15% in 2004-05 and 39% in 2009-10.

level, 62% of households belonging to the bottom 20% class in rural India and 52% of households in urban India purchased cereals from PDS in 2009-10. This was significantly higher than 34.8% (rural) and 29.9% (urban) in 2004-05 and 30.1% (rural) and 37.1% (urban) for the bottom 20%. Overall, it increased from 27.3% in 1993-94 to 23.3% in 2004-05 and 39.3% in 2009-10. The introduction of TPDS did increase access by the poorest 40% in rural areas; the percentage of households in the top 60% remained almost same by 2004-05. However, significant reduction in purchase was seen in almost all classes in Urban India, particularly among the top 60%. While this did reverse the earlier urban bias in TPDS, the rural areas were also beneficiaries of various other measures such as the Annapurna and the Antyodaya schemes which particularly benefitted those at the bottom 20% of the distribution.

Table 7: Percentage of households purchasing from PDS

| | 1993-94 | | | 2004-05 | | | 2009-10 | | |
|------------|---------|-------|-------|---------|-------|-------|---------|-------|-------|
| | Rural | Urban | Total | Rural | Urban | Total | Rural | Urban | Total |
| Bottom 20% | 30.1 | 37.1 | 31.8 | 34.8 | 29.9 | 33.5 | 62.0 | 52.0 | 59.2 |
| Next 20% | 29.9 | 38.0 | 32.0 | 32.0 | 23.0 | 29.6 | 55.3 | 39.5 | 50.8 |
| Next 20% | 28.0 | 33.1 | 29.3 | 28.9 | 16.4 | 25.5 | 47.2 | 28.9 | 41.9 |
| Next 20% | 26.7 | 27.6 | 27.0 | 25.8 | 9.4 | 21.2 | 39.5 | 16.8 | 32.7 |
| Top 20% | 20.5 | 17.3 | 19.6 | 16.0 | 3.4 | 12.3 | 28.5 | 7.7 | 22.0 |
| Total | 26.6 | 29.1 | 27.3 | 26.6 | 14.7 | 23.3 | 44.9 | 26.1 | 39.3 |

While improved access by the households at the bottom of the distribution was certainly instrumental in increased transfers to these households from the PDS, it was also a result of the lower prices of PDS items in most of these states. While Tamil Nadu continues to be the state with lowest prices for PDS items, most of the other states also reduced prices of PDS cereals between 2004-05 and 2009-10. As many as 13 major states have reduced prices of cereals (rice or wheat) in PDS shops to Rs 3 per Kg or less¹⁶. This has two impacts. First, given that food grain prices were rising during 2004-05 and 2009-10, particularly after March 2008, many more households were likely to buy from the PDS provided they had access to it than from the open market. Secondly, the large differential between PDS prices and market prices also meant that the quantum of transfer in value terms was much more than transfers in terms of quantity. This was in complete contrast to the situation prevailing in

¹⁶ These include Andhra Pradesh, Karnataka, Tamil Nadu, Kerala, Madhya Pradesh, Rajasthan, Chhattisgarh, Orissa, Jharkhand, Gujarat, Uttarakhand, West Bengal and Pondicherry.

2004-05 when PDS prices, although lower than market prices were close to the prevailing market prices. As against this, PDS issue prices in 1993-94 were fixed between MSP and economic cost thereby nullifying any price advantage to PDS consumers even though it was universal. While average market prices increased by almost three times for both rice and wheat between 1993-94 and 2009-10, average PDS prices decline in case of rice in rural as well as urban areas; they increased marginally in case of wheat.

Table 8: Average prices paid by consumers for rice and wheat

| | Rural | | Urban | | Economic Cost |
|--------------|-------|--------|-------|--------|---------------|
| | PDS | Market | PDS | Market | FCI |
| Rice | | | | | |
| 1993-94 | 4.8 | 6.9 | 5.3 | 8.0 | 6.7 |
| 2004-05 | 5.1 | 11.0 | 5.2 | 13.9 | 13.0 |
| 2009-10 | 3.9 | 18.3 | 3.4 | 24.0 | 18.2 |
| Wheat | | | | | |
| 1993-94 | 3.8 | 5.1 | 4.1 | 5.6 | 5.3 |
| 2004-05 | 4.5 | 9.3 | 5.7 | 10.6 | 10.2 |
| 2009-10 | 5.2 | 15.1 | 6.8 | 17.2 | 14.3 |

It is obvious that the increase in transfer through the PDS was largely a result of the difference in price between the PDS prices and market prices. However, in majority of cases the efficiency was achieved by not only reducing prices of PDS items but also expanding coverage. In fact, in most of the states both of these were strategies followed together. Clearly, this strategy was not only useful in expanding access and improving efficiency of the PDS, it was also seen in terms of its impact on welfare of the bottom half of the distribution.

However, since PDS is a food related scheme, the question that needs to be asked is also whether it improved access and absorption of food grains to the poor, in particular those accessing the PDS for food grain purchase. This is important not only from the perspective of nutrition alone but also because the poverty line, at least in popular parlance, was seen as anchored to some measure of minimum nutritional norms. While the Lakdawala estimates and earlier poverty measures were explicitly linked to the calorie norm, the Tendulkar committee took a conscious decision to do away with the calorie anchor. While doing so it did justify the normative requirements of food in the Tendulkar poverty lines to the outcome indicators based on the malnutrition indicators from the National Family

health Surveys (NFHS). However, an assessment on nutritional outcomes for 2009-10 is not possible since the NFHS surveys which are used to track nutritional outcomes are not available after 2005-06. The limited information available from the HUNGAMA survey by a private corporate organisation and the calorie intake information from the National Sample Survey confirm the trend that was seen since the early 1990s of slow or negligible improvements in nutritional outcome indicators or intake indicators such as calorie intake. There is now clear evidence of decline in cereal intake, pulses intake and this is also reflected declining intake of calories and proteins.

Nonetheless, it is worth looking at the cereal consumption, in particular consumption of rice and wheat, across categories of households as a measure of nutritional intake. While this may not be the best proxy for either nutritional intake or nutritional outcome, the fact that cereal consumption still contributes to 60% of total energy intake in rural areas and 50% in urban areas makes it an important indicator of nutritional intake. The percentage share of cereals in calorie intake for the bottom decile in rural areas is 73% in rural areas and 66% in urban areas. These percentages are also similar in case of protein intake, another indicator of nutritional intake. Further, since rice and wheat constitute bulk of cereal intake, the analysis is restricted to rice and wheat alone. The second reason is also the fact that PDS consumption is restricted to rice and wheat since the introduction of TPDS and therefore any impact would be primarily visible in case of rice and wheat. Table 9 gives the total per capita intake of rice and wheat and per capita intake purchased from the PDS.

Per capita intake of rice and wheat was 10.92 Kg in rural areas and 11.77 Kgs in urban areas in 1993-94 on average. It was 8.19 Kg (rural) and 8.25 Kg (urban) for the bottom 20% as against 13.25 (rural) and 9.52 (urban) for the top 20%. PDS consumption accounted for roughly 10% of the total consumption in rural as well as urban areas with higher per capita consumption as well as percentage consumption in urban areas reflecting the urban bias in PDS in 1993-94. There was marginal difference between per capita consumption from PDS between the bottom 20% and top 20%. The TPDS did lead to higher consumption for all classes from the PDS in rural areas partly because it was accompanied by reduction in PDS prices. However, it increased consumption from the PDS in urban areas for only the bottom 20%. But it did reverse the earlier trend of higher consumption in urban areas to rural areas.

By 2009-10, PDS consumption accounted for one third of total consumption of rice and wheat in rural areas and around one fourth in urban areas. Moreover, unlike a decline in rice and wheat consumption by almost 2 kgs for the upper quintile in rural areas, the consumption increased for the bottom 20% by 0.6 kg per capita. Even in urban areas, the per capita consumption of the bottom 20% was almost same as that of other classes unlike the case in 1993-94 where it was almost 1 kg per capita lower.

Table 9: Per Capita consumption of rice and wheat

| | Rural | | | Urban | | | Total | | |
|----------------|-------|------|-------|-------|------|-------|-------|------|-------|
| | Total | PDS | % PDS | Total | PDS | % PDS | Total | PDS | % PDS |
| 1993-94 | | | | | | | | | |
| Bottom 20% | 8.19 | 0.90 | 10.99 | 8.25 | 1.18 | 14.30 | 8.21 | 0.97 | 11.81 |
| Next 20% | 10.08 | 0.91 | 9.03 | 9.55 | 1.33 | 13.93 | 9.94 | 1.01 | 10.16 |
| Next 20% | 11.06 | 0.89 | 8.05 | 9.85 | 1.20 | 12.18 | 10.77 | 0.97 | 9.01 |
| Next 20% | 12.01 | 0.88 | 7.33 | 9.98 | 1.09 | 10.92 | 11.50 | 0.93 | 8.09 |
| Top 20% | 13.25 | 0.73 | 5.51 | 9.52 | 0.74 | 7.77 | 12.33 | 0.74 | 6.00 |
| Total | 10.92 | 0.86 | 7.88 | 9.43 | 1.11 | 11.77 | 10.54 | 0.92 | 8.73 |
| 2004-05 | | | | | | | | | |
| Bottom 20% | 8.75 | 1.33 | 15.20 | 8.44 | 1.19 | 14.10 | 8.68 | 1.30 | 14.98 |
| Next 20% | 9.94 | 1.28 | 12.88 | 9.24 | 0.97 | 10.50 | 9.77 | 1.21 | 12.38 |
| Next 20% | 10.69 | 1.21 | 11.32 | 9.56 | 0.73 | 7.64 | 10.40 | 1.08 | 10.38 |
| Next 20% | 11.30 | 1.13 | 10.00 | 9.25 | 0.44 | 4.76 | 10.77 | 0.95 | 8.82 |
| Top 20% | 12.15 | 0.78 | 6.42 | 8.87 | 0.16 | 1.80 | 11.33 | 0.63 | 5.56 |
| Total | 10.58 | 1.15 | 10.87 | 9.07 | 0.70 | 7.72 | 10.18 | 1.03 | 10.12 |
| 2009-10 | | | | | | | | | |
| Bottom 20% | 8.81 | 2.71 | 30.76 | 8.15 | 2.18 | 26.75 | 8.64 | 2.57 | 29.75 |
| Next 20% | 9.69 | 2.37 | 24.46 | 8.79 | 1.55 | 17.63 | 9.44 | 2.14 | 22.67 |
| Next 20% | 10.22 | 2.02 | 19.77 | 8.84 | 1.19 | 13.46 | 9.85 | 1.80 | 18.27 |
| Next 20% | 10.83 | 1.74 | 16.07 | 8.87 | 0.70 | 7.89 | 10.31 | 1.46 | 14.16 |
| Top 20% | 11.52 | 1.29 | 11.20 | 8.32 | 0.35 | 4.21 | 10.66 | 1.04 | 9.76 |
| Total | 10.22 | 2.03 | 19.86 | 8.60 | 1.20 | 13.95 | 9.78 | 1.80 | 18.40 |

This increase in consumption for the bottom 20% certainly owed itself to increased access and purchase from the PDS. Table 10 gives the per capita consumption of rice and wheat for PDS and non-PDS households in each quintile. The consumption of PDS users in rural areas in the bottom 20% increased by almost 2 kg per capita between 1993-94 and 2009-10 compared to marginal decline in the case of non-PDS households. The increase was highest in case of bottom 20% but was seen for all classes up to bottom 60%. This was also seen in case of urban areas but only for the poorest 20%. Interestingly, while the per capita

consumption of PDS households was almost 2 Kgs lower in 1993-94 in rural areas, it was only 0.2 kgs lower in 2009-10. However, in each quintile it was higher among the PDS households compared to non-PDS households. In 1993-94 as well as 2004-05 it was the other way round. On the other hand, in urban areas it was in fact higher by 1 kg per capita.

Table 10: Per Capita consumption of rice and wheat

| | Rural | | Urban | | Total | |
|----------------|---------|------|---------|------|---------|------|
| | NON-PDS | PDS | NON-PDS | PDS | NON-PDS | PDS |
| 1993-94 | | | | | | |
| Bottom 20% | 8.8 | 6.9 | 8.5 | 7.8 | 8.7 | 7.1 |
| Next 20% | 10.8 | 8.3 | 9.7 | 9.3 | 10.5 | 8.6 |
| Next 20% | 11.7 | 9.3 | 9.9 | 9.8 | 11.3 | 9.5 |
| Next 20% | 12.6 | 10.4 | 9.9 | 10.2 | 11.9 | 10.3 |
| Top 20% | 13.6 | 11.8 | 9.3 | 10.5 | 12.6 | 11.4 |
| Total | 11.5 | 9.1 | 9.5 | 9.4 | 11.1 | 9.2 |
| 2004-05 | | | | | | |
| Bottom 20% | 9.1 | 8.1 | 8.4 | 8.5 | 8.9 | 8.2 |
| Next 20% | 10.1 | 9.5 | 9.2 | 9.6 | 9.9 | 9.5 |
| Next 20% | 10.9 | 10.0 | 9.5 | 10.1 | 10.5 | 10.0 |
| Next 20% | 11.4 | 10.9 | 9.1 | 10.2 | 10.8 | 10.8 |
| Top 20% | 12.1 | 12.3 | 8.8 | 10.5 | 11.2 | 12.1 |
| Total | 10.8 | 9.8 | 9.0 | 9.4 | 10.3 | 9.7 |
| 2009-10 | | | | | | |
| Bottom 20% | 8.7 | 8.9 | 7.8 | 8.5 | 8.4 | 8.8 |
| Next 20% | 9.6 | 9.8 | 8.4 | 9.5 | 9.2 | 9.7 |
| Next 20% | 10.2 | 10.2 | 8.5 | 9.8 | 9.7 | 10.2 |
| Next 20% | 10.7 | 11.1 | 8.6 | 10.4 | 10.0 | 11.0 |
| Top 20% | 11.3 | 12.1 | 8.2 | 9.8 | 10.3 | 11.8 |
| Total | 10.3 | 10.1 | 8.3 | 9.3 | 9.7 | 10.0 |

Better access by the PDS consumers of cereals is also reflected in their per day calorie intake. Table 11 gives the per capita per day calorie intake among PDS households and non-PDS households. Unlike their non-PDS counterparts, households consuming from PDS show a trend of increasing calorie intake among the bottom quintile households. This is true for rural as well as urban areas. While calorie intake has declined among the remaining households for the remaining quintiles, it is also seen that the extent of decline is significantly lower among the PDS households compared to non-PDS households. So much so that by 2009-10, PDS households show higher intake of calories among all quintile groups in rural as well as urban areas. It was the other way round in 1993-94 and 2004-05 among all

quintile groups in rural areas and also among all quintile groups in urban areas except for the bottom two in urban areas.

Table 11: Per Capita per day calorie intake

| | Rural | | Urban | |
|----------------|--------------|------|--------------|------|
| | NON-PDS | PDS | NON-PDS | PDS |
| 1993-94 | | | | |
| Bottom 20% | 1599 | 1492 | 1569 | 1513 |
| Next 20% | 1925 | 1778 | 1851 | 1816 |
| Next 20% | 2149 | 1995 | 2037 | 2020 |
| Next 20% | 2389 | 2246 | 2269 | 2241 |
| Top 20% | 2896 | 2686 | 2689 | 2650 |
| Total | 2211 | 1988 | 2118 | 1973 |
| 2004-05 | | | | |
| Bottom 20% | 1584 | 1509 | 1565 | 1579 |
| Next 20% | 1836 | 1770 | 1803 | 1821 |
| Next 20% | 2044 | 1934 | 2017 | 2016 |
| Next 20% | 2227 | 2161 | 2153 | 2227 |
| Top 20% | 2638 | 2591 | 2551 | 2593 |
| Total | 2097 | 1896 | 2052 | 1850 |
| 2009-10 | | | | |
| Bottom 20% | 1473 | 1527 | 1456 | 1574 |
| Next 20% | 1705 | 1761 | 1702 | 1815 |
| Next 20% | 1879 | 1918 | 1865 | 1970 |
| Next 20% | 2057 | 2116 | 2036 | 2180 |
| Top 20% | 2420 | 2466 | 2322 | 2370 |
| Total | 1974 | 1870 | 1937 | 1835 |

Regression Analysis

The descriptive evidence shown earlier does confirm the fact that access to PDS has not only improved cereal consumption but also overall calorie intake. This has despite the fact that overall calorie intake as well as cereal intake for the population has continued to show declining trend. While this evidence is consistent with the evidence of downward shift of calorie Engel curves over the years as suggested by Deaton and Dreze (2009), it also adds credence to the body of research which suggests the efficacy of food security interventions such as PDS in improving access to cereals and calories. While the demand based analysis as suggested by Gaiha et al (2012) does find evidence in the previous discussion, the reality lies between the two competing arguments of declining energy requirements over the years

due to improvements in material well-being as well as lower improvements than what would have been the case otherwise. A large part of the demand based explanation is also based on the fact that declining calorie intake as well as cereal consumption have been due to the role of price variable. Gaiha et al (2012) do suggest a weakening of the expenditure elasticity and price elasticity while confirming the role of food security interventions in improving access to food.

To understand the role of various factors on calorie intake and cereal intake, an econometric exercise was also undertaken. The results of the econometric exercise broadly confirm the findings reported above. For the econometric exercise, log of per capita per day calorie intake was regressed over a set of independent variables. The independent variables used were:

Real MPCE: Monthly Per-capita Consumption Expenditure (MPCE) deflated using the poverty line deflators

Household size: as a proxy of household composition

Cultivator: dummy variable taking value 1 if the household is cultivator (self-employed in agriculture using the household type classification)

PDS consumer: dummy variable taking value 1 if the household purchased cereals from PDS

Real cereal prices: weighted cereal prices deflated by poverty line deflators

PDS efficiency: rice and wheat intake reported by NSS as a ratio of official Food Corporation of India off-take

Real total transfer ratio: ratio of MPCE including implicit transfers due to PDS consumption and MPCE and MPCE excluding transfers deflated by poverty line deflators

All the variables were entered in the regression in log. Separate regressions were estimated for rural and urban areas. The same set of explanatory variables was also used in a separate equation with dependent variable as per capita cereal consumption. Table 12 gives the coefficients and standard errors of the equation for 2009-10. The same set of equations was also attempted with a pooled set including 1993-94, 2004-05 and 2009-10 data. The results of the pooled regression are reported in table 13.

Table 12: Regression Results (2009-10)

| Rural | | | | |
|--------------------------------|----------------|----------------|------------------|------------------|
| | ln_calpcperday | ln_calpcperday | ln_qty_cereal_pc | ln_qty_cereal_pc |
| ln_hhsize | -0.111*** | -0.0902*** | -0.0987*** | -0.0718*** |
| | (0.00186) | (0.00193) | (0.00246) | (0.00255) |
| ln_realmpce | 0.342*** | 0.364*** | 0.172*** | 0.201*** |
| | (0.00199) | (0.00214) | (0.00262) | (0.00283) |
| cultivator | 0.0474*** | 0.0509*** | 0.0401*** | 0.0447*** |
| | (0.00223) | (0.00223) | (0.00295) | (0.00294) |
| pds_cereal_yes | 0.0739*** | | 0.0985*** | |
| | (0.00211) | | (0.00279) | |
| ln_cerealpricereal | -0.0166*** | -0.0128*** | -0.0131*** | -0.00816*** |
| | (0.00104) | (0.00104) | (0.00137) | (0.00138) |
| ln_pdsefficiency | 0.0719*** | 0.0907*** | 0.0330*** | 0.0577*** |
| | (0.00270) | (0.00271) | (0.00357) | (0.00359) |
| ln_totaltransferratio | | 0.859*** | | 1.135*** |
| | | (0.0202) | | (0.0267) |
| Constant | 5.124*** | 4.892*** | 1.125*** | 0.821*** |
| | (0.0165) | (0.0186) | (0.0218) | (0.0246) |
| Observations | 48,107 | 48,107 | 48,107 | 48,107 |
| R-squared | 0.511 | 0.517 | 0.280 | 0.288 |
| Urban | | | | |
| | ln_calpcperday | ln_calpcperday | ln_qty_cereal_pc | ln_qty_cereal_pc |
| ln_hhsize | -0.116*** | -0.107*** | -0.108*** | -0.0948*** |
| | (0.00230) | (0.00233) | (0.00311) | (0.00315) |
| ln_realmpce | 0.272*** | 0.275*** | 0.0810*** | 0.0847*** |
| | (0.00209) | (0.00215) | (0.00283) | (0.00291) |
| pds_cereal_yes | 0.0618*** | | 0.0851*** | |
| | (0.00316) | | (0.00427) | |
| ln_cerealpricereal | -0.0498*** | -0.0452*** | -0.0537*** | -0.0485*** |
| | (0.00243) | (0.00258) | (0.00329) | (0.00348) |
| ln_pdsefficiency | 0.0419*** | 0.0489*** | 0.00817 | 0.0172** |
| | (0.00546) | (0.00550) | (0.00738) | (0.00744) |
| ln_totaltransferratio | | 0.552*** | | 0.731*** |
| | | (0.0304) | | (0.0412) |
| Constant | 5.755*** | 5.706*** | 1.872*** | 1.816*** |
| | (0.0181) | (0.0199) | (0.0245) | (0.0269) |
| Observations | 35,656 | 35,656 | 35,656 | 35,656 |
| R-squared | 0.474 | 0.474 | 0.250 | 0.248 |
| Standard errors in parentheses | | | | |
| *** p<0.01, ** p<0.05, * p<0.1 | | | | |

Note: coefficients and standard errors for state dummies are not reported here but are available on request

Table 13: Regression Results (Pooled)

| | | | | |
|--------------------------------|----------------|----------------|------------------|------------------|
| Rural | | | | |
| VARIABLES | ln_calpcperday | ln_calpcperday | ln_qty_cereal_pc | ln_qty_cereal_pc |
| ln_hhsize | -0.0640*** | -0.0546*** | -0.0523*** | -0.0419*** |
| | (0.000970) | (0.000979) | (0.00127) | (0.00128) |
| ln_realmpce | 0.406*** | 0.418*** | 0.209*** | 0.221*** |
| | (0.00109) | (0.00111) | (0.00142) | (0.00145) |
| cultivator | 0.0632*** | 0.0637*** | 0.0546*** | 0.0545*** |
| | (0.00106) | (0.00105) | (0.00138) | (0.00137) |
| ln_cerealpricereal | -0.0369*** | -0.0280*** | -0.0392*** | -0.0306*** |
| | (0.000940) | (0.000950) | (0.00123) | (0.00124) |
| pds_cereal_yes | 0.0435*** | | 0.0565*** | |
| | (0.00127) | | (0.00165) | |
| ln_totaltransferratio | | 0.852*** | | 0.956*** |
| | | (0.0145) | | (0.0189) |
| Constant | 5.111*** | 4.997*** | 1.344*** | 1.233*** |
| | (0.00926) | (0.00948) | (0.0121) | (0.0124) |
| Observations | 195,172 | 195,172 | 195,168 | 195,168 |
| R-squared | 0.513 | 0.519 | 0.268 | 0.273 |
| Urban | | | | |
| | ln_calpcperday | ln_calpcperday | ln_qty_cereal_pc | ln_qty_cereal_pc |
| ln_hhsize | -0.102*** | -0.0975*** | -0.0951*** | -0.0911*** |
| | (0.00127) | (0.00128) | (0.00174) | (0.00175) |
| ln_realmpce | 0.314*** | 0.316*** | 0.0824*** | 0.0824*** |
| | (0.00119) | (0.00120) | (0.00163) | (0.00165) |
| ln_cerealpricereal | -0.104*** | -0.0966*** | -0.125*** | -0.127*** |
| | (0.00194) | (0.00207) | (0.00265) | (0.00284) |
| pds_cereal_yes | 0.0289*** | | 0.0400*** | |
| | (0.00180) | | (0.00246) | |
| ln_totaltransferratio | | 0.419*** | | 0.324*** |
| | | (0.0228) | | (0.0313) |
| Constant | 5.942*** | 5.911*** | 2.397*** | 2.411*** |
| | (0.0107) | (0.0112) | (0.0147) | (0.0154) |
| Observations | 123,543 | 123,543 | 123,541 | 123,541 |
| R-squared | 0.497 | 0.497 | 0.225 | 0.224 |
| Standard errors in parentheses | | | | |
| *** p<0.01, ** p<0.05, * p<0.1 | | | | |

Note: coefficients and standard errors for state and year dummies are not reported here but are available on request

Both the set of regression equations on calorie intake per capita per day show significant negative coefficient for the price variable. Although the elasticities are not large they are negative implying inverse relationship between calorie intake and cereal prices. For the rural equations, we have used dummy variable for those households who are cultivators and this is significant for 2009-10 as well as the pooled regressions. In both cases, the coefficient of real MPCE is significant and positive although the coefficient is almost half in case of per capita cereal consumption compared to calorie intake. The coefficients and the corresponding elasticities are similar to the elasticities reported by Subramanian and Deaton (1996) and Gaiha et al (2012). While other factors may be at work, the fact that the price variable has negative significant coefficient may partially explain the puzzle of declining cereal consumption and a trend of dietary diversification towards other items such as milk and non-vegetarian items. However, it must be mentioned that the trend of declining cereal consumption is seen for all classes, it is much stronger amongst higher expenditure classes than the lower expenditure classes and also stronger among non-PDS households. In fact, there is no significant trend for PDS households. The low elasticity of the price variable may partially be also the reflection of the expansion of PDS which has not only expanded access but also reduced the average price of cereals.

For capturing the impact of PDS, two different variables were used. The first is the dummy variable which takes the value 1 if the household has purchased any cereal from the PDS. Alternative variable used is the real total transfer ratio which is the ratio of MPCE including income transfer from purchase from PDS over MPCE. Both these measures are positive and significant. It is also important to note that the coefficient of real transfer ratio is almost double that of the coefficient of real MPCE. In other words, the implicit transfers from the PDS are far more effective in improving nutritional intake or cereal consumption than increases in MPCE. For the 2009-10 round, we also introduced a variable which is the state level PDS efficiency variable. This variable is essentially the percentage of official off-take from the FCI being captured by the NSS consumption estimates. A state with zero leakages will have this measure as 100 while a state with 50% leakages will take the value 50. However, the two key messages from the regression analysis are clearly that lowering of cereal prices does have an impact on calorie intake as well as cereal intake and secondly,

implicit transfers from the PDS have significantly larger impact on calorie intake as well as cereal consumption compared to increase in real incomes.

Conclusion

The decline in poverty between 2004-05 and 2009-10 has come as a surprise despite the fact that the period after 2004-05 has been the period of highest ever growth of the Indian economy. To a certain extent the element of surprise is justified given the fact that 2009-10 has been an abnormal year both because of the drought and the economic recession but also because of the unprecedented run of inflation since March 2008. This is somewhat borne out by the analysis also which shows lower contribution of growth to overall poverty reduction. What did contribute to significant poverty reduction directly was the increased transfers from the PDS and the MDM both of which show expansion and increase in access which largely benefitted the poorer sections of the society. The revival of PDS is now confirmed from primary as well as secondary surveys and the fact that it is led by state governments, in particular some of the poorest states has also meant that it is now delivering to the poor where it matters. While this is muted in case of the HCR measure, it is much more robust and large when looked at through the higher order measures of poverty.

The fact that PDS and MDM did contribute to a significant part of the large poverty reduction story after 2004-05 should not appear surprising. The elasticity of public expenditure to poverty reduction has always remained high in the Indian context as the previous literature has already brought out in the context of the poverty reduction seen during 1983 and 1987-88¹⁷. A large literature which had examined the reasons for the sharp decline in poverty during the 1980s did attribute it to the significant step-up in public expenditure. This incidentally is also the case during 2004-05 where public expenditure led social safety nets not only contributed to a significant part of poverty reduction directly but also indirectly through the public employment programmes and the increase in wages for

¹⁷ There are large number of similarities between 1983 to 1987-88 period and 2004-05 to 2009-10 period. Both had terminal years as severe drought years. Both the periods were witness to the fastest growth of agricultural output and fastest growth of casual wages. In fact, the rate of growth of output as well as wages was very similar to in both these periods. Both these periods were also characterized by significant step up in public expenditure, particularly in public employment creation. Both these periods also saw a gain in terms of trade in favour of agriculture.

the casual labour households. But even the growth of household incomes is contributed to a significant extent by the step up in public expenditure. While MGNREGA may not be seen as the only factor contributing to wage rate growth acceleration, the increase in number of days by roughly eight times between 2004-05 and 2009-10 was certainly helpful in providing additional incomes to the poorer households. Similarly while consumers benefitted from lower prices of cereals in the PDS, the producers also benefited by the significant increase in MSP and increase in procurement.

While this is obviously confirmed from the descriptive analysis as well as the regression analysis, the large variation across performance of states also points to differential response to the functioning of the PDS to poverty, calorie intake or cereal consumption. The clear message is primarily that states which have continued to retain the framework of targeted PDS have seen lower improvements either in terms of poverty or in terms of nutritional indicators. On the other hand, states which have expanded coverage beyond the officially mandated poverty estimates have not only seen better improvements in consumption but also significantly lower leakages. In most cases where this strategy of expansion of coverage has been adopted it has also been accompanied by lowering of cereal prices in the PDS which again has led to improvements in expenditures as well as nutritional intake.

Finally, while the lower PDS prices compared to market prices did lead to larger transfers to the PDS users and thereby improving welfare for the poor both in terms of income as well as cereal intake, it does lead to the question of whether this was the efficient way of doing so. This question assumes importance in the wake of recent debate on using in-kind transfers such as PDS and MDM versus the cash transfers, proponents of which have repeatedly argued that it will lead to better prices for the farmers without distorting the market prices and would also lead to lower leakages. In fact apart from the fact that the PDS has been criticised for huge leakages, it has also been criticised on account of inefficient functioning of the FCI (Jha and Ramaswami, 2010). This argument is largely based on the fact that the economic cost of FCI for rice and wheat has been higher than the market prices thereby leading to losses. Thus, the move to cash transfers is largely based on the argument that it will involve less leakages and will also be cost effective in terms of allowing the population have the same purchasing power as in case of in-kind transfers. The analysis of Jha and

Ramaswami was based on 2004-05 data when economic cost of rice and wheat were certainly higher than the market prices in rural areas¹⁸. However, they were lower than the market prices in urban areas. On the other hand, economic cost has remained lower than market prices in 1993-94 as well as 2009-10 for rice¹⁹. This was also the case for wheat except for 1993-94 in rural areas²⁰. While this is no justification for the various inefficiencies of FCI, the fact that the market prices have remained on average higher than economic costs does indicate that the FCI may not be after all as inefficient as it is made out to be. Moreover, it must also be kept in mind that a part of the economic cost of FCI is also a result of 12-15% taxes on food procurement which the private traders do not pay.

Of course, the argument that cash transfers do not necessarily imply actual purchases by the households for which the transfers are made has been made earlier in this context. This exercise is also crucial for looking at the impact of PDS on food security and nutrition which remains the primary purpose of a scheme like PDS. The evidence presented above does suggest that consumption of rice and wheat has increased for those households who have access to PDS compared to non-PDS households. It also shows improvement in per capita consumption among the poorer households against a trend of declining cereal consumption among top 40% households. This has implications for the design of the proposed National Food Security legislation which has so far hinged on a targeted approach.

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¹⁸ Rice market price was lower than economic cost in 25 states out of 30 states (excluding union territories) in rural areas and 14 out of 30 states in urban areas.

¹⁹ In 1993-94 only 9 states in rural areas and 2 states in urban areas had market prices lower than the economic cost. In 2009-10 this was the case in 14 states in rural areas and 3 states in urban areas.

²⁰ In 1993-94, 12 states in rural areas and 10 states in urban areas had market prices lower than economic cost. This was 6 states in rural areas and 5 states in urban areas in 2009-10.

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