In-Kind Food Transfers – II

Impact on Nutrition and Implications for Food Security and Its Costs

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Part-II reports the impact of in-kind food transfers on nutritional intake as measured by calories. Econometric analysis using a simple calorie demand function confirms the significance of variables relating to public distribution system access, controlling for other covariates, in its contribution to calorie intake. Results also suggest that the calorie-elasticity of PDS transfers is twice as large compared to additional out-of-pocket income equal to the cash equivalent of PDS transfers. These are also confirmed by non-parametric analysis of calorie intake of various consumer groups. Although preliminary, these results suggest caution in advocating cash transfers as substitute of in-kind transfers. Finally, the paper evaluates concerns about the financial implications of the minimum support price-PDS system in light of the recently enacted National Food Security Act.

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The first part of this paper had discussed the changing reach of in-kind food transfers through the public distribution system (PDS) and mid-day meals (MDM) served in schools and *balwadis*. This had also quantified their contribution to poverty reduction. While confirming targeting errors and high leakages, the impact of these in-kind food transfers on poverty reduction, particularly of PDS in 2009-10, was found to be much larger than is usually acknowledged. However, poverty reduction is only instrumental to the stated purpose of these interventions, which is access to food and improvement in nutrition. Moreover, the PDS continues to be controversial because of its leakages; and arguments to replace these by food coupons and cash transfers have resurfaced very strongly in the course of the debate on the National Food Security Bill/Act (NFSB/NFSA). This part of the paper takes up some of these issues. Section 1 is on calorie consumption and the PDS, Section 2 is on costs of implementing these in-kind food transfers, and, in conclusion, there are some observations on the NFSA.

Calorie Consumption and the PDS

As introduction to this part of the paper, and to give an overview, Table 1 (p 61) provides quintile-wise data on all-India per capita calorie intake from rounds 50 (1993-94), 61 (2004-05) and 66 (2009-10) of the National Sample Survey (NSS). This is done separately for two distinct set of households: those who had purchased any food item from the PDS during the survey recall period and those who did not buy any PDS food. For each set of households, the calorie intake figures are by two different concepts: including calories from free MDM and not including calories from MDM. This is necessary to maintain comparability over time because the published NSS figures on calorie intakes do not include MDM calories till 2009-10 (66th round) but in that year a certain amount of calories were imputed per free MDM. It was possible to maintain comparability since earlier NSS rounds did collect data on the number of such meals consumed and calorie imputation similar to that in 66th round could be carried out. Also, obviously, 66th round data could be recast in the earlier form by simply excluding the MDM imputations.

The two most important points from Table 1 are both well known but worth repeating. First, that calorie intake of the vast majority of Indians is below Indian Council of Medical Research (ICMR) norms. In no year for any household set and whether MDM is included or not, does average per capita

calorie intake cross 2,200 kcal/day till the 4th MPCE (monthly per capita expenditure) quintile class. Second, except in very few cases at the bottom quintiles, calorie intakes have declined steadily over time, despite there being a clear positive gradient with income. Since malnutrition is now much more prevalent than official poverty, it would clearly be rather incongruous to limit discussions on food security and of in-kind food transfers to just the consumption poor. Also, since calorie intakes are falling despite rising incomes, it is necessary to treat nutrition as a matter quite distinct from adequate income.

Table 1: Per Capita Calorie Intake Per Day

	Rural					Urban				
Quintile Class	1	2	3	4	5	1	2	3	4	5
Calorie intake (not including MDM) of households not purchasing PDS food										
1993-94	1,576	1,923	2,144	2,382	2,914	1,514	1,825	2,044	2,286	2,705
2004-05	1,577	1,822	2,036	2,223	2,643	1,561	1,805	2,015	2,154	2,558
2009-10	1,474	1,704	1,878	2,060	2,427	1,454	1,701	1,867	2,037	2,329
Calorie intake (not including MDM) of households purchasing PDS food										
1993-94	1,563	1,865	2,093	2,343	2,830	1,562	1,842	2,027	2,254	2,669
2004-05	1,544	1,791	1,970	2,181	2,583	1,595	1,836	2,006	2,182	2,494
2009-10	1,525	1,761	1,916	2,108	2,443	1,574	1,810	1,963	2,147	2,343
Calorie intake (including MDM) of households not purchasing PDS food										
1993-94	1,582	1,929	2,148	2,386	2,916	1,530	1,841	2,056	2,289	2,707
2004-05	1,633	1,875	2,077	2,254	2,664	1,598	1,826	2,025	2,158	2,559
2009-10	1,603	1,775	1,940	2,109	2,454	1,543	1,739	1,891	2,050	2,339
Calorie intake (including MDM) of households purchasing PDS food										
1993-94	1,583	1,879	2,103	2,350	2,833	1,579	1,853	2,032	2,258	2,670
2004-05	1,655	1,883	2,048	2,241	2,615	1,676	1,892	2,035	2,191	2,495
2009-10	1,636	1,861	1,991	2,165	2,482	1,654	1,857	1,986	2,158	2,348

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

The two other points worth noting from Table 1 are about how calorie intakes relate to in-kind food transfers. First, calories added by MDM were insignificant across all quintiles in 1993-94 and remained so for most of the urban population in 2009-10. However, these now average around 5% of total calorie intake of the poorest urban quintile and of the three bottom rural quintiles. Second, it is noticeable that except for the two poorest urban quintiles, 1993-94 calorie intakes averaged lower for PDS users than those who did not use PDS. This was because rural purchase of PDS cereals was confined mostly to cereal deficit states where cereal prices were higher and average intakes less. This altered slightly in 2004-05 and reversed subsequently when high food inflation caused intakes to decline much more among those unable to access PDS. By 2009-10, calorie intake of PDS users was more than that of non-users in all quintiles, both rural and urban. However, even in 2009-10, calorie intake of the average PDS user was less than of a non-user because a much larger proportion of PDS users are from poorer quintiles. Clearly, food transfers have an impact on calorie intakes of the relatively poor much more now than earlier, but the determinants remain complex.

The MDM impact in Table 1 understates its importance for those availing it. For example, only a third of the households in the bottom three rural quintiles had children availing MDM in 2009-10, and MDM calories averaged 15% of total calorie intake of these households. Moreover, the addition was obviously much larger for their children who actually consumed the free meals in schools and balwadis. While some of these households probably saved on food expenditure as a result, and not all MDM calories were necessarily additional, there is little doubt that children having these meals got more nutrition than if equivalent cash had been given to households and shared with other members and on other uses. In any case, since MDM is better self-targeted with much less leakage than PDS and also helps attendance and classroom attention, this is a straightforward and fairly uncontroversial in-kind food transfer. Consequently, this section concentrates on impact of PDS on calorie intake.[1]

The case of PDS is more complicated because this invokes some very strongly held opposing views. Being the largest subsidy item of central government, expenditure on minimum support price (MSP) operations and PDS has long been a subject of controversy. The MSP-PDS system has obvious appeal in terms of being seen to provide direct food security: encouraging food production by price support to farmers and also enabling millions to PDS benefits. But, as with any subsidy, this distorts markets and leads to inefficiencies and misuse. A persistent criticism since the 1980s has been that the poor get only a small share of government spending, with critics calling for more targeting and to give freer play to physical markets by replacing PDS with coupons or cash. But, as discussed in Part I of this paper, a shift to targeted PDS (TPDS) (in 1997 actually increased leakages massively with an insignificant effect on poverty.

Since then, many states have revitalised PDS by widening access with positive effects on poverty reduction and on leakage. However, although fewer critics advocate narrow targeting today, the stated purpose of the NFSA 2013 "to provide for food and nutritional security in human life cycle approach, by ensuring access to adequate quantity of quality food at affordable prices" ignites critics' fears that this might restrict the growth of markets by giving legal permanence to MSP-PDS. On the other hand, activists, who demand widened PDS benefits, oppose the very idea that food security can be provided with mere cash.

This issue, of whether cash transfers can provide at least similar food security as MSP-PDS, involves several matters beyond the scope of this paper. Of the three pillars of food security – availability, access and absorption – cash transfers to consumers cannot obviously serve the first, i e, ensure adequate physical food supply at all times everywhere. Although critics of the MSP-PDS argue that markets can improve upon its functions that address availability (open-ended MSP and Food Corporation of India (FCI) procurement, transport and storage operations),[2] these functions (and costs thereby incurred) are likely to continue in some form since no government can ignore the farmer interest or possible supply-side shocks. Therefore, if at all, cash transfers are likely to focus directly only on the second food security pillar, i e, access, provided at present through nearly 5,00,000 fair price shops (FPS) selling subsidised grain. With nearly 40% of this grain diverted between FCI depots and consumers, the aim would be to remove the subsidy from grain price and transfer this into bank accounts of beneficiaries, giving them more choice on what and where to buy. But while this may be more attractive than the other methods that some states have used successfully

to plug leakages, two hurdles would need to be crossed before full roll-out: (i) expand the bank network (about 1,00,000 branches of which only 37,000 are rural, plus possibly 1,55,000 post offices) to match the much larger FPS reach; and (ii) index cash transfers against food price inflation, including to local variations which may enlarge if the switchover makes some FPS unviable and leads to their exit. Implementing these will involve costs but, unless addressed, cash transfers may end up giving beneficiaries less access to equivalent cash, leave alone food, than they currently get from the PDS.

It is not possible to go into details of cash transfer alternatives but NSS data do allow examination of a related issue which is also relevant for the third pillar of food security, i e, absorption. This is whether in-kind PDS transfers lead to more calorie intake than equivalent out-of-pocket expenditure? To this question, the answer from usual consumer theory is no, i e, the effect on food and calorie intake of a transfer through PDS is expected to be same as from an equivalent additional out-of-pocket spending from any source, at least for the overwhelming majority of households who supplement PDS by buying from the market.[3] But "right to food" campaigners and most women activists disagree. They argue that PDS improves nutrition by reducing household risks regarding food access and also making it less likely that a woman's priorities get subordinated to a man's preferences in the course of intra-household decision-making.

This empirical matter, which is not the same as comparing PDS to any specific cash transfer proposal, can be tested with NSS data.[4] This is done by fitting simple calorie demand functions based on usual consumption theory and taking predictions of this theory as a null hypothesis. Broadly, per capita calorie intake is assumed to be a function of MPCE_PDS (i e, per capita expenditure including PDS food transfers), market prices and some household characteristics, and the test is whether PDS has any additional effect. The results of this exercise, in Tables 2 (a) to (c), support the activists.

Table 2(a) reports results for households who made no PDS purchase, either by choice or for lack of access. The calorie demand function excludes imputed MDM[5] and, following Subramanian and Deaton (1996), regresses log of per capita calorie intake per day (Ln_calpcperday) against log of household size (LnHHsize) and log of per capita expenditure. Since these households received no PDS transfer, only their out-of-pocket expenditure is relevant and the variable used is LnrealMPCEMRP, the log of MPCEMRP deflated for cost of living using state and sector specific modified poverty lines (Appendix Table 3 of Part 1). The price variable (Lnrealcerealprice) used is log of the average price of market purchased cereals in the household's first stage unit (FSU),[6] also deflated by state/sector poverty lines. Other explanatory variables are dummies: "Cultivator" (value 1 if household is self-employed in agriculture and 0 otherwise) that is expected to be positive and, following Dreze and Deaton (2009) who posit that calorie demand reduces with better infrastructure, "LPG" (value 1 if household's main fuel for cooking is LPG, 0 otherwise) and "Electricity" (value 1 if household's lighting is mainly electricity, 0 otherwise). State dummies control for unobserved variations.

Fitted to households who did not use PDS at all, these can be taken as calorie demand functions in absence of PDS. Coefficients of LnrealMPCEMRP are highly significant and in the range of other studies.[7] As expected, these are higher in rural areas than urban and, consistent with the observed downward shift of calorie Engel curves, these decline over time: from 0.59 to 0.37 in rural and 0.49 to 0.29 in urban. Similarly, the price elasticity is significantly negative, about -0.1 rural and -0.2 urban. The coefficient on household size turns from mild positive in 1993-94 to strong negative in 2009-10, while all the dummies have expected signs and almost all are significant.

Table 2(b) reports results of fitting the same function to a completely different set of households: those which accessed PDS and were resident in FSUs where PDS cereals were available. Since almost all these households received in-kind PDS food transfers, MPCE_PDS is the relevant expenditure. Therefore, an additional explanatory variable is included: Lntransferratio (log of the ratio of MPCE_PDS to MPCEMRP). The null hypothesis is that the coefficient on this should be same as on LnrealMPCEMRP.

The null hypothesis is rejected. The coefficients on Lntransferratio are significantly higher than those on LnrealMPCEMRP, while all other coefficients of this simple calorie demand function have similar signs and patterns for households covered in Table 2(b) as for the completely different households in Table 2(a).

Table 2(a): Estimated Calorie Demand Function (AnyPDS=0)

	1993-94		2004-05		2009-10		Pooled	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Variables	Ln_calpcperday	Ln_calpcperday	Ln_calpcperday	Ln_calpcperday	Ln_calpcperday	Ln_calpcperday	Ln_calpcperday	Ln_calpcperday
Lnreal MPCEMRP	0.595*** (0.00612)	0.492*** (0.00725)	0.416*** (0.00406)	0.313*** (0.00329)	0.372*** (0.00498)	0.286*** (0.00331)	0.460*** (0.00292)	0.343*** (0.00249)
Lnreal cereal_price	-0.138*** (0.0114)	-0.236*** (0.0190)	-0.0915*** (0.00721)	-0.284*** (0.00971)	-0.101*** (0.0105)	-0.288*** (0.0101)	-0.098*** (0.00542)	-0.245*** (0.00700)
LnHHsize	0.0177*** (0.00473)	0.00514 (0.00614)	-0.0324*** (0.00337)	-0.0863*** (0.00322)	-0.0548*** (0.00456)	-0.0968*** (0.00325)	-0.021*** (0.00244)	-0.070*** (0.00232)
Cultivator	0.0627*** (0.00592)		0.0647*** (0.00358)		0.0726*** (0.00486)		0.0713*** (0.00273)	
LPG	-0.207*** (0.0170)	-0.0981*** (0.00985)	-0.101*** (0.00467)	-0.0270*** (0.00428)	-0.0493*** (0.00516)	-0.00687 (0.00472)	-0.102*** (0.00367)	-0.030*** (0.00333)
Electricity	-0.0962*** (0.00662)	-0.114*** (0.00992)	-0.0267*** (0.00497)	-0.00198 (0.00712)	-0.0560*** (0.00712)	-0.00630 (0.00934)	-0.054*** (0.00351)	-0.036*** (0.00487)
Constant	4.355*** (0.0423)	5.105*** (0.0535)	5.011*** (0.0309)	5.756*** (0.0268)	4.807*** (0.0624)	4.568*** (0.0546)	4.917*** (0.0275)	6.150*** (0.0267)
Observations	13,235	12,450	19,572	22,405	10,317	18,604	43,124	53,459
R-squared	0.499	0.390	0.461	0.455	0.478	0.460	0.460	0.412

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

This is the calorie demand function estimated for households which did not purchase any item (including kerosene) from PDS in the reference year. Coefficients and standard errors of state dummies for individual years and year dummies in case of pooled sample are not reported but are available from authors on request.

In particular, with coefficients of Lnreal MPCEMRP very similar in Tables 2(a) and 2(b), this suggests almost the same elasticity of calorie intake to out-of-pocket expenditures for both household sets. However, the large coefficients on Lntransferratio, near unity, imply that calorie intake has much higher elasticity to MPCE_PDS increase if this results from PDS food transfers rather than from equivalent increase in out-of-pocket cash.[8]

Finally, Table 2(c) reports results of fitting this simple calorie demand function to all households, i e, all those included in 2(a) and 2(b) plus those who had PDS access but who lived in FSUs where no household purchased PDS cereals. It may be seen that coefficients on most variables are similar to, and intermediate between, corresponding coefficients of Tables 2(a) and 2(b). In particular, coefficients on Lnreal MPCEMRP, on Lnrealcerealprice, on LnHHsize and on Cultivator are all similar to those found by other studies, with plausible trends over time[9]. Similarly, the LPG and Electricity dummies are significant with expected negative sign and, again plausibly, these effects reduce over time. All coefficients in the pooled fit are in-between those of fits to individual years and are very similar to pooled estimates in Tables 2(a) and 2(b). Overall, therefore, this simple function is robust over time and to sample selection.

The coefficients on Lntransferratio in Table 2(c) are also similar to those in table 2(b), confirming that calorie intake has much higher elasticity to MPCE_PDS if this increases on account of PDS food transfers rather than equivalent out-of-pocket cash. Further, the fits in Table 2(c) include an additional variable to capture PDS access. This variable AnyPDS takes value 1 for households with any PDS purchase and 0 otherwise. It may be noted that while AnyPDS is 0 for all households in Table 2(a), and is 1 for all households in Table 2(b), Table 2(c) contains both these household types and also many who did not avail transfers despite PDS access (i e, AnyPDS=1, Lntransferratio=0). The estimated coefficients on AnyPDS are highly significant and positive, suggesting that ceteris paribus just having PDS access affects calorie intake, possibly because of the assurance this provides, even if PDS food is not actually purchased. This effect (2.5%, 3.5% and 4.2% rural and 6.4%, 4.9% and 6.8% urban in 1993-94, 2004-05 and 2009-10) is not trivial and appears to have enlarged over time.

The main conclusion above, that PDS may improve calorie intake by more than cash equivalent of its transfers, is suggested by other studies also.[10] But, in addition, the simple calorie demand function used here

Table 2(b): Estimated Calorie Demand Function (AnyPDS=1 & PDS_fsu=1)

	1993-94		2004-05		2009-10		Pooled	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Variables	Ln_calpcperday	Ln_calpcperday	Ln_calpcperday	Ln_calpcperday	Ln_calpcperday	Ln_calpcperday	Ln_calpcperday	Ln_calpcperday
Lnreal MPCEMRP	0.540***	0.449***	0.443***	0.385***	0.412***	0.369***	0.463***	0.407***
	(0.00356)	(0.00388)	(0.00293)	(0.00484)	(0.00269)	(0.00395)	(0.00174)	(0.00239)
Lnreal cereal_price	-0.107***	-0.214***	-0.112***	-0.190***	-0.0704***	-0.169***	-0.097***	-0.179***
	(0.00646)	(0.00871)	(0.00519)	(0.00910)	(0.00444)	(0.00795)	(0.00300)	(0.00480)
LnHHsize	-0.0290***	-0.0656***	-0.0540***	-0.0819***	-0.0861***	-0.105***	-0.054***	-0.082***
	(0.00284)	(0.00345)	(0.00243)	(0.00444)	(0.00223)	(0.00364)	(0.00145)	(0.00220)
Cultivator	0.0638***		0.0476***		0.0500***		0.0562***	
	(0.00289)		(0.00242)		(0.00219)		(0.00144)	
LPG	-0.115***	-0.0560***	-0.0836***	-0.0401***	-0.0566***	-0.0404***	-0.077***	-0.046***
	(0.00736)	(0.00379)	(0.00387)	(0.00476)	(0.00285)	(0.00366)	(0.00229)	(0.00232)
Electricity	-0.0401***	-0.0316***	-0.0255***	-0.0267***	-0.0270***	-0.0339***	-0.027***	-0.028***
	(0.00316)	(0.00462)	(0.00292)	(0.00646)	(0.00270)	(0.00593)	(0.00168)	(0.00315)
Lntransferratio	0.960***	1.172***	0.669***	1.156***	0.856***	0.991***	0.910***	1.165***
	(0.0585)	(0.0794)	(0.0299)	(0.0563)	(0.0195)	(0.0316)	(0.0165)	(0.0267)
Constant	4.700***	5.437***	4.942***	5.404***	4.639***	4.616***	4.949***	5.586***
	(0.0248)	(0.0274)	(0.0221)	(0.0374)	(0.0285)	(0.0469)	(0.0164)	(0.0227)
Observations	29,089	22,629	36,241	12,791	37,130	16,258	102,460	51,678
R-squared	0.554	0.552	0.514	0.509	0.547	0.544	0.527	0.539

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Note: This is the calorie demand function estimated for households which not only purchased some item from PDS in the reference year but were resident in FSUs where some household purchased PDS cereals. Coefficients and standard errors of state dummies and year dummies for pooled sample are not reported but available from authors.

Table 2(c): Estimated Calorie Demand Function (All Households)

	1993-94		2004-05		2009-10		Pooled	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Variables	Ln_calpcperday	Ln_calpcperday	Ln_calpcperday	Ln_calpcperday	Ln_calpcperday	Ln_calpcperday	Ln_calpcperday	Ln_calpcperday
Lnreal MPCEMRP	0.551***	0.464***	0.442***	0.333***	0.401***	0.315***	0.469***	0.370***
	(0.0024)	(0.0032)	(0.0020)	(0.0025)	(0.0022)	(0.0024)	(0.00128)	(0.00156)
Ln real cereal_price	-0.112***	-0.219***	-0.109***	-0.257***	-0.078***	-0.220***	-0.098***	-0.211***
	(0.0043)	(0.0075)	(0.0034)	(0.0060)	(0.0038)	(0.0060)	(0.00220)	(0.00371)
Ln HHsize	-0.013***	-0.033***	-0.036***	-0.079***	-0.073***	-0.096***	-0.035***	-0.071***
	(0.0019)	(0.0027)	(0.0017)	(0.0024)	(0.0018)	(0.0023)	(0.00105)	(0.00144)
Cultivator	0.062***		0.052***		0.055***		0.0594***	
	(0.0020)		(0.0017)		(0.0018)		(0.00108)	
LPG	-0.142***	-0.070***	-0.094***	-0.030***	-0.057***	-0.019***	-0.091***	-0.037***
	(0.0059)	(0.0034)	(0.0026)	(0.0029)	(0.0023)	(0.0027)	(0.00173)	(0.00175)
Electricity	-0.060***	-0.073***	-0.030***	-0.023***	-0.029***	-0.024***	-0.038***	-0.038***
	(0.0023)	(0.0039)	(0.0021)	(0.0041)	(0.0022)	(0.0046)	(0.00128)	(0.00242)
AnyPDS	0.025***	0.064***	0.035***	0.049***	0.042***	0.068***	0.0344***	0.0640***
	(0.0025)	(0.0033)	(0.0020)	(0.0027)	(0.0024)	(0.0026)	(0.00131)	(0.00164)
Lntransferratio	1.001***	1.344***	0.686***	0.868***	0.874***	0.789***	0.960***	1.049***
	(0.0569)	(0.0885)	(0.0280)	(0.0518)	(0.0184)	(0.0286)	(0.0155)	(0.0260)
Constant	4.603***	5.271***	4.872***	5.681***	4.630***	4.716***	4.850***	5.879***
	(0.0167)	(0.0225)	(0.0153)	(0.0196)	(0.0235)	(0.0328)	(0.0118)	(0.0159)
Observations	66,037	44,960	76,142	42,167	56,636	38,731	198,815	125,858
R-squared	0.538	0.469	0.491	0.472	0.519	0.492	0.509	0.467

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

This is the calorie demand function estimated for all households. Details of state dummies for individual years and year dummies for the pooled sample are not reported but are available from authors on request.

enables some quantification of the PDS impact on calorie intake of the population as a whole. This is done by calculating, for each NSS household in each of the three rounds, the percentage difference between its actual calorie intake and its predicted calorie intake if PDS was absent. The mean and statistical significance of these household level percentage differences by MPCE quintile class are presented in Table 3. The predictions in panel 1 of this table are from equations in Table 2(c), setting both Lntransferratio and AnyPDS to zero for all households. In panel 2, predictions are obtained for all households by applying the equations in Table 2(a) that were obtained from fits made only to households with AnyPDS=0.

All estimates in Table 3, of percentage excess of actual calorie intake over predicted intake in absence of PDS, are significantly positive and, except at tails of the distribution, the estimates in its two panels are very close to each other. For total population and middle quintiles where estimates are reliable, the percentage excess calorie intake due to PDS is in almost all cases much larger than the percentage value of PDS transfers in MPCE.[11] Also, changes over time in PDS contribution to calorie intake closely track both the erosion of the urban reach of the PDS after targeting in 1997 and post-2004 PDS improvements that were noted in Part I of this paper. These confirm the much larger calorie elasticity to PDS transfers than to equivalent cash and also independent importance of PDS reach. In particular, improved coverage and better transfers appear to have increased PDS impact on calorie intake very substantially in 2009-10, especially for poorer quintiles. The bottom line is that calorie intake of the population as a whole (rural+urban) may have been about 6% higher in 2009-10 than would be without PDS. This contribution had declined from 4% in 1993-94 to 3.5% in 2004-05 but increased with PDS revival.

These estimates must be treated as preliminary since they imply rejection of a null hypothesis which is textbook economics: that PDS impact would be limited to the income effect of transfers when PDS is mainly intra-marginal. It is therefore expected that the matter will be further researched with much better econometrics than used here. But if correct, this has very serious implication for proposals to replace the PDS by cash transfers. With elasticity of calorie intake to out-of-pocket cash only 0.4, cash transfers in lieu of the PDS would need to be around 15% of MPCE to maintain 2009-10 calorie intake levels. Since 2009-10 PDS transfers were only 3% and 1.1% of MPCE in rural and urban areas, calorie intakes would fall further unless cash transfers were several times higher than present MSP-PDS expenditure even allowing for savings on leakage.

Table 3: Per Cent Excess of Actual Calorie Intake over Predicted Intake without PDS (averaged over total population, including non-beneficiaries)

	1993-94		2004-05		2009-10	
Quintile Class of MPCEMRP	Rural	Urban	Rural	Urban	Rural	Urban
1 Based on equations fitted to all households (Table 2c)						
1	0.44*	3.16***	1.68***	2.79***	6.21***	5.99***
2	4.77***	8.49***	3.98***	4.64***	7.95***	8.15***
3	5.14***	8.62***	4.85***	4.85***	8.12***	7.47***
4	4.78***	8.60***	4.81***	3.60***	7.70***	5.88***
5	1.05***	2.91***	2.43***	0.26*	3.77***	0.50**
All	3.10***	6.03***	3.53***	3.03***	6.35***	5.23***
2 Based on equations fitted to HH with AnyPDS=0 (Table 2a)						
1	2.41***	2.39***	0.29*	1.36***	4.13***	3.54***
2	5.94***	7.85***	3.22***	3.77***	6.14***	6.70***
3	5.93***	8.33***	4.57***	4.49***	7.06***	6.70***
4	5.19***	8.49***	5.03***	3.73***	7.52***	6.11***
5	1.04***	3.29***	4.00***	1.45***	4.50***	2.39***
All	3.82***	5.85***	3.68***	2.77***	6.01***	4.88***

*** p<0.01, ** p<0.05, * p<0.1

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

Interestingly, this strong support for activists is despite PDS transfers being fungible. Actual calorie gains turn out to be less than half of what would be if PDS transfers had been spent entirely on more cereals. Also, although the near unit elasticity of calorie intake to an increase in MPCE_PDS from PDS transfers is much higher than to out-of-pocket cash, this implies that a sizeable part of these transfers is spent on non-food at the margin. A further point may be noted in this context. Analysis similar to above was done for cereal consumption and for residual calories from non-cereal. These results are not reported here but show that cereal consumption would be about 7% less without PDS and that non-cereal calories would also drop, though not too significantly.

All the above follow because the large magnitudes of PDS impact in Table 3 reflect not only the income effect of PDS transfers but also its role as a shifter, e g, AnyPDS in equations of Table 2(c) which shifts calorie Engel curves down without PDS access. Thus the main result here, that calorie intakes could fall even if replacement of PDS by cash transfers reduced poverty, may sound contradictory but is similar to the "calorie puzzle" that Deaton and Dreze (2009) had illustrated with calorie Engel curves. With average per capita calorie intakes down more than 7% from 1993-94 to 2009-10, despite reduction of consumption poverty by 15 percentage points, it is useful to look at the non-parametric evidence from calorie Engel curves. These may be more convincing than regression results in this controversial area.

Charts 1 to 8 (p 65) present calorie Engel curves for 1993-94, 2004-05 and 2009-10 for four distinct sets of households: (a) those that purchased some PDS cereal but, although they may have had self-production of this, did not purchase the same cereal from the market; (b) those that purchased PDS cereals and also bought the same cereal from the market; (c) those that did not purchase any PDS cereal in the reference period but did buy some other PDS item so that it can be presumed that they had PDS access; and (d) those who had no PDS purchase at all, most of whom can be assumed to have lacked any PDS access. These Engel curves and shifts over time are presented for All-India (rural+urban) and also All-India urban, separately. In all cases, per capita calorie intake (without MDM) is plotted on the vertical axis against real MPCE_PDS expressed as a ratio of the Tendulkar poverty line. The latter not only adjusts MPCE for spatial and temporal variations in prices but also takes into account PDS transfers.

For both all-India and urban, there is some downward shift over time in calorie Engel curves for all four sets of households but this is of different magnitudes. The shifts, particularly at lower MPCE, were largest in category (d) followed by (c), (a) and (b) in that order. The largest downward shift, around 20%

Chart 1: PDS But No Market Purchase of Cereals (Rural + Urban)

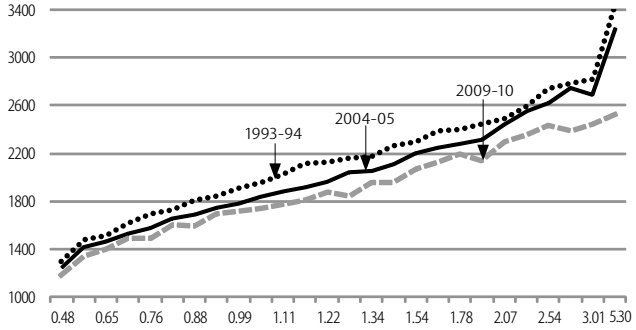


Chart 2: Both PDS and Market Purchase of Cereals (Rural +Urban)

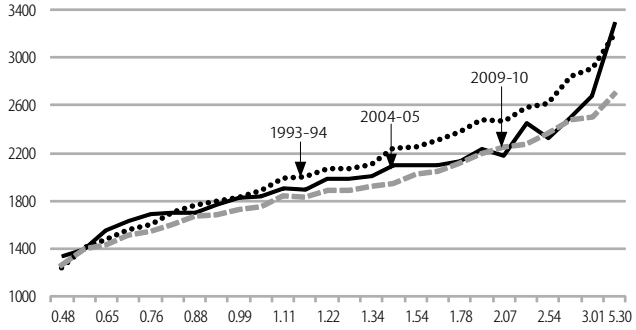


Chart 3: Some PDS Purchase But Not of Cereals (Rural + Urban)

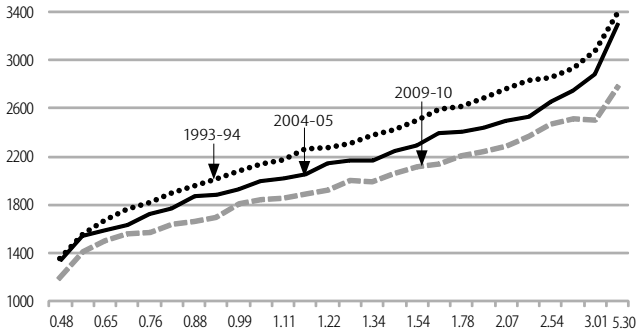


Chart 4: No PDS Purchase (Rural +Urban)

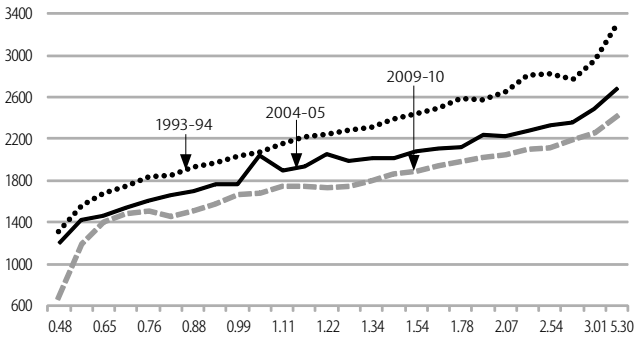


Chart 5: PDS But No Market Puchase of Cereals (Urban)

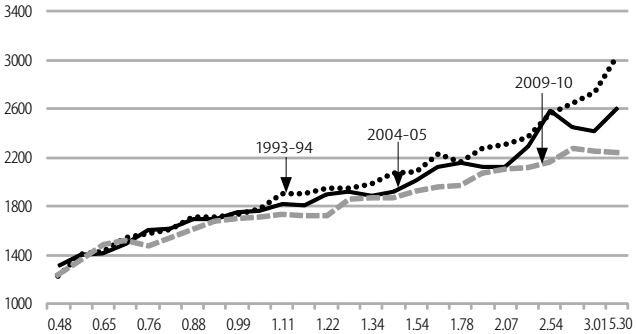


Chart 6: Both PDS and Market Purchase of Cereals (Urban)

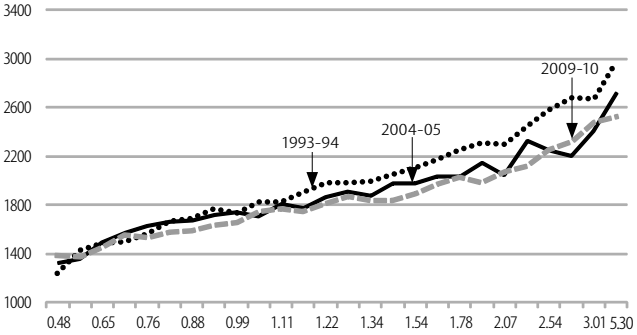


Chart 7: Some PDS Purchase But Not of Cereals (Urban)

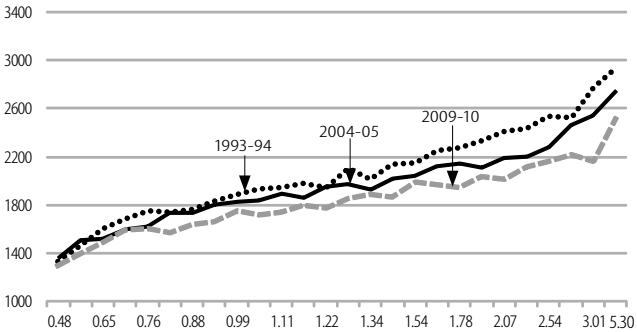
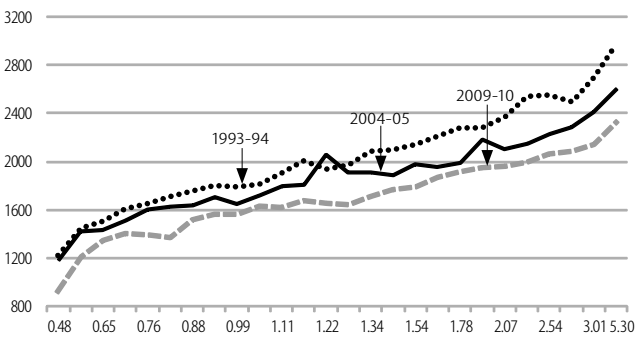


Chart 8: No PDS Purchase (Urban)



across all income groups, was in case of those without PDS access and this was least, well below 5% for the poor among them, for those who bought cereals from both PDS and the market. This is very strong evidence that PDS is helping to maintain nutrition in ways unanticipated by theory which would predict exactly the same behaviour for these two categories. Moreover, since as noted earlier there is some downward shift in non-cereal calories as well, these shifts in calorie Engel curves should not be dismissed as shift from staple to quality.

Charts 9 and 10 (p 66), which juxtapose calorie Engel curves of these four household sets, show that those without any PDS access had about 10% lower calorie intake for the same transfer inclusive income in 2009-10 than all others who did have PDS access. Calorie intakes of those with PDS access at the official Tendulkar poverty line averaged only the rock-bottom Food and Agriculture Organisation (FAO) minimum of 1,800 calories in 2009-10. But the calorie Engel curves of those without PDS access crossed the FAO minimum at a MPCE level 35%

Chart 9: 2009-10 (Urban)

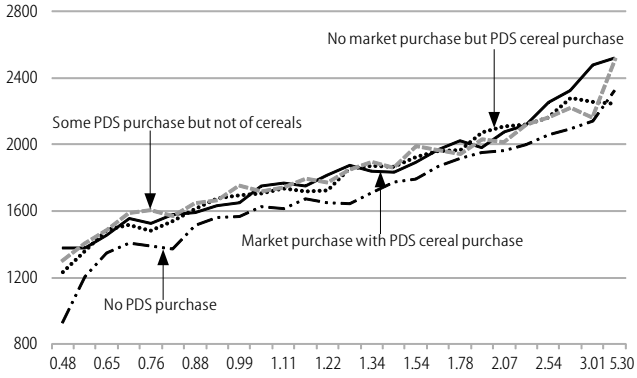
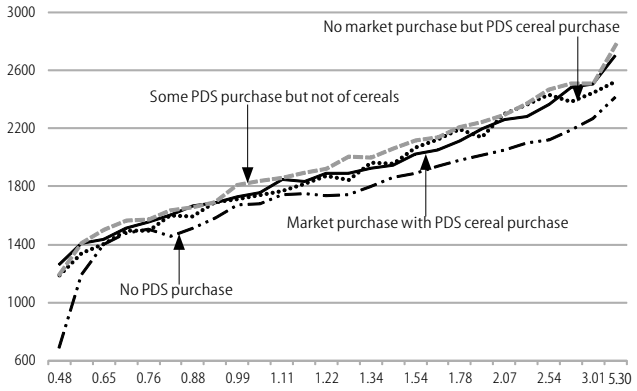


Chart 10: 2009-10 (Rural +Urban)



higher than the poverty line. If these are any indication at all of what the situation would be without PDS, the proportion of people with below 1,800 calorie intake could rise to over 50% from less than 40% actually in 2009-10. The proportion below 2,200 calories could go up from about 70% to well over 80%.

All this too needs to be subjected to further research since Engel curves may differ by region and household characteristics. Nonetheless, together with the regression results that do control for some of these effects, these constitute very strong a priori evidence against simple theory and in favour of activists. That PDS access (and not just PDS transfers) may have slowed a continuing fall in calorie intakes, and that extending such access could improve intakes significantly, is relevant to how PDS is evaluated, in particular, against cash transfers. Moreover, this evidence in conjunction with that presented in Part I of this paper, that many more people are now buying cereals from PDS and that just its transfer impact on poverty has increased over time, should put at rest all claims that PDS is less relevant now for majority of Indians than it was earlier.

The Costs of In-Kind Food Transfers

The preceding sections, which have tried to quantify consumer benefits of in-kind food transfers, show that these have increased over time and now contribute significantly to both poverty reduction and nutrition. However, most discussion of these transfers is not about their benefits but about costs of implementation. In view of this, Table 4 gives details of relevant budgetary expenditure of both the centre and states using a wide definition. For the centre, this is its total budgetary food subsidy (paid to the FCI and to states, not only for PDS but all schemes and to carry stocks) plus all expenditure on MDM (including fuel, labour, utensils, kitchen facilities, etc). For states, this comprises non-Plan revenue expenditure on "Civil Supplies" and "Food, Storage & Warehousing", including items other than cereals and sugar, and the entire revenue expenditure under "Nutrition" (which includes ready-made supplements, takeaway rations and much else besides cooked meals). This expenditure has increased as a percentage of gross domestic product (GDP) but, interestingly, by only 0.13 percentage points during the last decade as compared to 0.29 percentage points in the previous one. Even more interestingly, the increase as a percentage of GDP after 2003-04 has been entirely on the states' side and not of the centre.

As compared to food transfers in the NSS, which include PDS purchase of only rice, wheat and sugar and cooked meals served in schools and balwadis, coverage of budgetary expenditures in Table 4 is much wider. In particular, the NSS does not capture subsidies that many states give on items other than cereals and sugar through civil supply departments or subsidies that flow through FCI to welfare schemes other than MDM or Integrated Child Development Services (ICDS) and, even in schools and balwadis, NSS does not include ready-made supplements or takeaway rations. Further, central and state expenditures have been added in Table 4 although there may be

Table 4: Budgetary Expenditures Related to In-Kind Food Transfers

	Centre			States			Centre and States Total
	Gross Food Subsidy	MDM	Total	Civil Supply and Food Storage	Nutrition	Total	
Rs crore in current prices							
1993-94	5,537	0	5,537	1,249	674	1,923	7,460
2001-02	17,499	1,031	18,530	2,457	2,288	4,745	23,275
2002-03	24,176	1,237	25,413	2,345	2,298	4,643	30,056
2003-04	25,181	1,375	26,556	2,531	2,855	5,386	31,942
2004-05	25,798	1,508	27,306	2,912	3,262	6,174	33,480
2005-06	23,077	3,011	26,088	3,266	4,022	7,288	33,376
2006-07	24,014	4,813	28,827	4,157	4,845	9,002	37,829
2007-08	31,328	6,004	37,332	4,376	6,178	10,554	47,886
2008-09	43,751	7,200	50,951	6,624	8,475	15,099	66,050
2009-10	58,443	6,932	65,375	9,114	11,235	20,349	85,724
2010-11	63,844	8,859	72,703	9,332	13,453	22,785	95,488
2011-12	72,822	9,759	82,581	11,276*	17,322*	28,598*	1,11,179
2012-13	85,000*	10,241*	95,241*	12,068**	19,171**	31,239**	1,26,480
2013-14	90,000**	11,893**	1,01,893**				
As % GDP at market prices							
1993-94	0.62	0.00	0.62	0.14	0.08	0.22	0.84
2001-02	0.75	0.04	0.79	0.10	0.10	0.20	0.99
2002-03	0.96	0.05	1.00	0.09	0.09	0.18	1.19
2003-04	0.89	0.05	0.94	0.09	0.10	0.19	1.13
2004-05	0.80	0.05	0.84	0.09	0.10	0.19	1.03
2005-06	0.62	0.08	0.71	0.09	0.11	0.20	0.90
2006-07	0.56	0.11	0.67	0.10	0.11	0.21	0.88
2007-08	0.63	0.12	0.75	0.09	0.12	0.21	0.96
2008-09	0.78	0.13	0.90	0.12	0.15	0.27	1.17
2009-10	0.91	0.11	1.01	0.14	0.17	0.32	1.33
2010-11	0.82	0.11	0.93	0.12	0.17	0.29	1.22
2011-12	0.81	0.11	0.92	0.13	0.19	0.32	1.24
2012-13	0.85	0.10	0.95	0.12	0.19	0.31	1.26
2013-14	0.80	0.10	0.90				

* Revised Estimate, ** Budget Estimate

Sources: Union Budget Documents and Reserve Bank of India: State Finances: A Study of Budgets.

some overlap[12] and these also include reimbursement of the costs of carrying stocks that are not transfers to consumers.[13] Nonetheless, Table 5 attempts a comparison.

Panel 1 of Table 5 compares the budgetary data from Table 4 with NSS estimates of value of all in-kind food transfers as computed in Part I of this paper. Compared to the sum of centre and states budgetary expenditures, NSS estimates of the total value of all food transfers received by all households were 52%, 43%, 62% and 61% in 1993-94, 2004-05, 2009-10 and 2011-12, respectively. As a percentage of GDP, these work out to 0.44%, 0.44%, 0.82% and 0.75%, respectively. Since the budgetary data have much wider coverage than the NSS, the large gaps between expenditures and receipts are not all leakage.

Table 5: NSS Estimates of In-Kind Food Transfers as against Official Expenditure

	NSS Estimate of Transfers Received		Official Estimates of Expenditure Incurred (Rs Crore) by			NSS Receipts as % of Centre and State Expenditure	NSS Receipts of Bottom 40% Population as % of Expenditure	
	Rs Crore (All HHs)	Share of Bottom 40%	Centre	States	Centre and States		Total Centre and States	Less Procurement Icidentals
1 All in-kind food transfers from NSS against all relevant expenditures by centre and states								
1993-94	3,878	41.0	5,537	1,923	7,460	52.0	21.3	25.3
2004-05	14,345	54.7	27,306	6,176	33,482	42.8	23.4	26.2
2009-10	52,755	52.2	64,879	20,349	85,228	61.9	32.3	37.2
2011-12	67,423	48.8	82,581	28,598	1,11,179	60.6	29.6	34.3
2 MDM transfers from NSS against centre's expenditure on MDM and states' on nutrition								
1993-94	504	63.9	28	674	702	71.8	45.9	
2004-05	6,570	60.1	3,263	3,263	6,526	100.7	60.5	
2009-10	16,410	57.9	10,354	11,235	21,589	76.0	44.0	
2011-12	20,456	50.3	14,819	17,322	32,141	63.6	32.0	
3 PDS transfers from NSS against centre's budgetary food subsidy less subsidies to FCI other than on PDS plus state's non-plan revenue expenditures on civil supplies and food warehousing and storage								
1993-94	3,374	37.6	3,706	1,249	4,955	68.1	25.6	33.4
2004-05	7,775	50.1	21,641	2,913	24,554	31.7	15.9	18.5
2009-10	36,345	49.6	47,871	9,114	56,985	63.8	31.6	39.5
2011-12	46,967	48.2	60,448	11,276	71,724	65.5	31.6	40.1
4 Sum of 2 and 3 above								
1993-94	3,878	41.0	3,734	1,923	5,657	68.6	28.1	35.6
2004-05	14,345	54.7	24,904	6,176	31,080	46.2	25.3	28.5
2009-10	52,755	52.2	58,225	20,349	78,574	67.1	35.0	40.9
2011-12	67,423	48.8	75,267	28,598	1,03,865	64.9	31.7	37.1

Columns 2 and 3 from NSS unit data; columns 4, 5 and 6 from Table 4 and Annual Reports of Food Corporation of India (FCI). In panel 2, column 4 includes FCI subsidies on sales to MDM, ICDS and SC/ST schools; and in panel 3, column 4 is gross food subsidy less FCI subsidy for carrying buffer stocks and on sales other than PDS. Column 8 is transfers received by bottom 40% as % of column 6 while in column 9 the denominator excludes from PDS subsidy the cost of MSP operations (FCI unit procurement incidentals multiplied by PDS offtake quantity). The latter were Rs 1,161 crore, Rs 3,520 crore, Rs 11,307 crore, Rs 15,260 crore in 1993-94, 2004-05, 2009-10 and 2011-12.

But, in line with the earlier discussion, it is noticeable that this gap increased between 1993-94 and 2004-05 following the adoption of TPDS and that it has reduced thereafter as states have widened coverage. In particular, the large increase in public expenditure as a percentage of GDP noted during 1993-2004 in Table 4 finds no reflection at all in NSS transfers, while the smaller expansion in official spending during 2004-12 is dwarfed by the increase that NSS does capture as a percentage of GDP in the subsequent period. Moreover, although it is also true that the NSS shows the poor receiving a higher percentage of total transfers in 2004-05 than in 1993-94 or subsequently, improvements in transfer efficiency after 2004-05 have dominated over any targeting loss to cause substantial increase in the share that the bottom 40% of population get out of total government food related expenditures.

Remaining panels of Table 5 attempt to decompose MDM and PDS, after removing elements of centre's food subsidy (carrying cost of buffer stocks and subsidies incurred on FCI sales other than to schools and balwadis or through PDS) that are not part of transfers captured by NSS.[14] However, conceptual differences remain on the state side and official expenditures are still not fully comparable to NSS transfers and most likely continue to overestimate leakage.[15] Nonetheless, earlier conclusions are reinforced by Panel 4 of Table 5 that provides the bottom line after decomposition and pruning.

The two main developments between 1993-94 and 2004-05 were targeting PDS with a view to improve the low share of the poor, and the nationwide MDM adoption which was mainly a consequence of Supreme Court orders. These improved the distribution of food transfers received very significantly, and MDM did reduce poverty as discussed in Part I. But targeting was associated with such a large loss in PDS transfer efficiency that the poor may have ended up getting a lower share of what government spent.

Subsequent developments during 2004-12 saw further MDM expansion but the centre's PDS subsidies did not increase as a percentage of GDP and there was no change in design. Nonetheless, NSS captures a very large increase in PDS transfers received (from 0.24% of GDP in 2004-05 to 0.57% in 2009-10 and 0.52% in 2011-12) which as discussed earlier had a significant effect on poverty. Resulting almost entirely from much improved PDS transfer efficiency, this was mainly due to states' efforts that Table 4 captures partly as increase in states' spending. Such ownership and effort appears crucial. Its lack was one reason why TPDS failed before 2004-05 and, with transfer efficiencies correlating strongly with the degree to which states complement central effort,[16] this was critical in the undoubted revitalisation of PDS after 2004-05.

There are several other details relating to Tables 4 and 5 which help bring the cost side into line with the broad outlook of this paper, and correct the generally pessimistic way in which costs of in-kind food transfers have been interpreted in most of the literature. There are two broad and rather old concerns that dominate discussions, both of which resurfaced in the course of the debate on NFSA. First is that India's food subsidies are too open-ended and are occupying an increasing share of fiscal space. Second is the perceived incurability of inefficiencies of the MSP-PDS system, which is still usually argued with 2004-05 data.[17] In this context, the following are relevant:

(a) As may be seen from Table 4, the increase in food related public spending as a percentage of GDP after 2003-04 has not been on account of MSP-PDS but rather on MDM by the centre and on nutrition by the states. Spending under these two heads increased from only 0.08% of GDP in 1993-94 to 0.21% in 2004-05 and further to 0.36% of GDP in 2012-13.[18] This was mainly due to Supreme Court orders that led to a massive but relatively uncontroversial expansion of the MDM and ICDS.

Negligible before 2001, hot cooked meals are now served in almost every government school and *anganwadi*. As Part I of this paper noted, these free meals reduced poverty by as much as PDS in 2004-05 and, as Table 5 shows, at less than quarter the cost. Moreover, as is evident on comparing panels 2 and 3 of Table 5, the self-targeted MDM has outperformed PDS, with less leakage and better distributed delivery, although the difference between the two closed in 2011-12. Clearly, MDM expansion after 2004-05 has had less than proportionate impact on poverty but it did accompany reduction of out-of-school children from about 20% to well below half of this. Most importantly, the already near universal coverage, and insignificant increase in the number of 0-6 age children between 2001 and 2011, means that the NFSA mandates very little further expansion.

(b) In contrast to some claims to the contrary, the centre's budgetary food subsidy has not spiralled out of control as a percentage of GDP. In fact, as Table 4 shows, this has remained below its 2001-04 average except temporarily following the 2009 drought. Moreover, as Table 5 shows, PDS transfer efficiency has improved substantially after plummeting in 2004-05. PDS leakages are still unacceptably high but, as was shown in Part I of this paper, these are reducing with improved access. All this means that reliance on 2004-05 data gives too pessimistic a reading of the MSP-PDS system. For example, as Table 6 shows, 2004-05 was a clear outlier on how the FCI's economic costs compare with market prices. The economic cost has actually been declining in relation to MSPs, and the cost of public supply compares quite favourably with market prices in all other years.[19]

(c) While most aspects of Table 6 are self-evident, a few points are in order regarding the MSP side of the MSP-PDS system. This, unlike its PDS side, is actually open-ended and in fact works as an incentive only where farmers are reasonably sure that they will get MSP and not be rationed out. Procurement incidentals therefore have an overhead component, necessary to implement MSP. It may be seen that not only have MSPs increased more than market prices, procurement incidentals have increased even more. Obviously, part of the cost of the MSP-PDS system relates to price support for farmers and should not be attributed as consumer subsidy. This has relevance to claims that cash transfers can improve upon subsidies through the MSP-PDS system. It may be seen in Table 5 that although the bottom 40% of population would have gained if all centre and state MSP-PDS expenditures had been distributed as untargeted cash transfers without cost or leakage, this would not be true in 2009-10 or 2011-12 if the MSP system was to continue and what was available for transfers were expenditures less procurement incidentals.[20]

(d) Moreover, since MSPs have been rising faster than market prices, there can be imbalances that impose costs on the MSP-PDS system which are not due to its operational functioning but to policy errors. In this context, Chart 11 shows that procurement and PDS offtakes were roughly in balance till the early-1990s but have diverged since, particularly after 1997. Due mainly to MSP-PDS policy, this divergence caused stocks to reach record levels in 2002 which was followed in the next four years by a moderation in MSP setting in and also by a more than doubling of PDS sales at unchanged issue prices. As may be seen from Table 4, the food subsidy was contained in nominal terms during 2003-04 – 2006-07 and fell very significantly as a percentage of GDP. This outcome, partly a result of stock changes, brings out that even large increases in PDS sales at relatively high unit subsidy can be fiscally benign if distortions in MSP-PDS policy have caused too wide a gap between procurement and offtake.

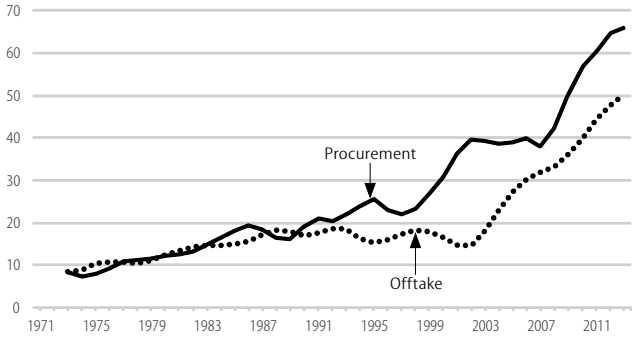
Table 6: Official and NSS Details Regarding MSP-PDS for Rice and Wheat

	Rice				Wheat			
	1993-94	2004-05	2009-10	2011-12	1993-94	2004-05	2009-10	2011-12
Prices and unit values (Rs per quintal)								
MSP (derived for rice)	465	840	1,500	1,665	330	630	1,080	1,170
Procurement incidentals	40	58	289	350	89	183	207	236
FCI economic cost (EC)	665	1,304	1,820	2,,123	532	1,019	1,425	1,595
Weighted consumer issue price (CIP)	437	576	609	569	330	438	496	492
Official unit subsidy (OUS)	228	728	1,211	1,554	202	581	929	1,103
NSS market price (MP)	736	1,150	1,942	2,058	603	972	1,647	1,760
NSS market price rural	712	1,122	1,867	1,986	580	945	1,586	1,670
NSS own produce price (OPP)	609	960	1,584	1701	390	714	1,139	1106
NSS PDS price	496	509	380	381	390	471	551	584
NSS unit transfer (NUT)	240	641	1,562	1,677	213	501	1,096	1,176
PDS per capita offtake/consumption (kg/month/person)								
Official (OQ)	0.82	1.25	1.66	1.84	0.54	0.98	1.34	1.37
NSS (NQ)	0.66	0.76	1.25	1.44	0.26	0.27	0.55	0.66
Ratios								
MSP/OPP	0.76	0.87	0.95	0.98	0.85	0.88	0.95	1.06
MSP/MP	0.63	0.73	0.77	0.81	0.55	0.65	0.66	0.66
EC/MSP	1.43	1.55	1.21	1.28	1.61	1.62	1.32	1.36
EC/MP	0.90	1.13	0.94	1.03	0.88	1.05	0.87	0.91
NQ/OQ	0.81	0.61	0.75	0.78	0.48	0.28	0.41	0.48
NUT/OUS	1.05	0.88	1.29	1.08	1.05	0.86	1.18	1.07

All NSS variables, including prices and unit values, are population weighted. NSS market prices refer to prices paid by only those who also purchased PDS. Own produce price is NSS price of own produced grain for self-consumption in rural areas and is imputed at selling prices.

Chart 11: Procurement and PDS Offtake

(three-year moving averages, million tonnes)



(e) This is relevant to the present situation and discussions on the cost of the NFSA because MSPs have been doubled after 2006-07 and the gap between procurement and offtake has widened again, taking stocks to levels even higher than in 2002. Not only has procurement increased sharply, the 2010-13 average of 65 million tonnes was more than NFSA commitments.[21] Moreover, grain stocks on 1 July 2013 were at least 21 million tonnes more than required.[22] These stocks are imposing huge costs which are not captured fully in official subsidy estimates but are building up as off-budget debt.[23] With procurement now adequate for the NFSA and production trending above population, it should be possible to moderate MSPs and

reduce excess stocks.[24] Potential annual savings from these may be about Rs 20,000 crore.[25]

(f) These potential off-budget savings are comparable to the extra PDS cost that the NFSA does impose. The Financial Memorandum to NFSA 2013 put the full year subsidy following the Act as Rs 1,08,966 crore at 2013-14 prices, i e, Rs 19,000 crore more than the Rs 90,000 crore in 2013-14(BE).[26] From this, the Medium-term Expenditure Framework Statement, laid before Parliament in August 2013, projects the centre's food subsidy to increase to Rs 1,20,000 crore in 2014-15 and to Rs 1,35,000 crore in 2015-16, assuming 10% annual MSP increase. This implies that the food subsidy will rise to about 0.95% of GDP and stabilise around that level. Further, a number of states already give more entitlements than proposed in the NFSA and currently bear the additional subsidy. The additional NFSA cost to the centre in these cases is only a transfer from the centre to the states, with corresponding savings on PDS by the states. Although states with currently poor PDS infrastructure may need to spend more, since overall states' expenditures on this are already quite large, actual additional cost to the centre and states combined could be much less than additional cost to the centre. Moreover, there are the potential savings noted above on account of high stocks and the moderation of MSP that these permit.

The above should help allay fears regarding costs of the NFSA which have been flagged by several sources. The most important of these was a 2012 working paper by the Commission for Agricultural Costs and Prices (CACP) which put the food subsidy cost at Rs 1,34,698 crore in the first year of the NFSA and projected total cost of Rs 2,41,263 crore including a large component to enhance agricultural production. These estimates from the official expert body that recommends MSP and other farm policy implied a total NFSA cost of 2.4% of GDP, including an increase in PDS cost by 0.5% of GDP. In the context of an intense debate, these were obviously seized and amplified upon by detractors of the legislation. In view of this, it is necessary to consider the CACP estimates.

While its other costs were compiled mainly from departmental wish lists, it is important to note how CACP arrived at its food subsidy estimate. This assumed 70 million tonnes procurement, to which 2012-13 FCI unit economic costs were applied to arrive at total cost of grain of Rs 1,54,812 crore. From this, Rs 20,114 crore were deducted as sales receipts, obtained by applying prices specified by the bill then in Parliament to its specified allocation of 52 million tonnes. The point to note is that unlike the normal procedure to calculate costs of supply by applying unit economic costs to quantities sold, CACP applied unit costs to quantities procured. The normal procedure would, with all other CACP assumptions intact, have given a post-NFSA subsidy estimate of Rs 96,200 crore, 30% less than what CACP projects and only Rs 11,200 crore (0.11% of GDP) more than the subsidy in 2012-13(RE). The large difference is because CACP assumed implicitly that 18 million tonnes of grain procured would not fetch any price and would either remain perpetually in stock or have to be disposed free.

It is not known why CACP made such a drastic departure from normal practice. But it appears to have been benchmarked to the large 17 million tonnes stock increase during agricultural year 2011-12, with the purpose perhaps to signal the long-run consequences of the underlying imbalance that caused procurement to persistently exceed offtake for several years. But, while certainly a matter of concern, these imbalances and the high and rising stocks predate the NFSA and were the result of several factors including better production, excessive caution on sales and most importantly large MSP hikes, e g, 15% in 2012-13. Quite apart from CACP factoring excess procurement into cost while also making large MSP awards, this draws attention to other inconsistencies in the working paper. For example, its assumption that an extra Rs 66,000 crore will be required in the very first year of the NFSA to enhance agricultural production is inexplicable. This is three times the centre's present total agriculture outlay and, although there may well be a case to fund agriculture more, it certainly did not follow from NFSA grain requirements in the context of current excess procurement. The CACP costing of the NFSA was deeply flawed since it chased too many divergent concerns. It did draw attention to several important issues but that should not alter the official estimates of NFSA costs.

Conclusions

This paper has analysed the impact that the PDS and cooked MDM, in schools and balwadis, have on poverty and calorie intake. Contrary to the view that food self-sufficiency and income growth have reduced the need for such direct food interventions, we report a significant increase in the contribution of such in-kind transfers to both poverty reduction and nutrition.

On poverty, our decompositions of the Tendulkar poverty estimates show that in-kind food transfers lifted 55 million people above the poverty line in 2009-10. The number of poor would have been 402 million without these transfers, 16% more than the 347 million who remained poor after transfers. The corresponding 1993-94 difference, 413 million poor before food transfers and 402 million after, was 11 million or only 3%. It may be noted that, notwithstanding GDP growth and other anti-poverty schemes, the number of poor before food transfers had declined by only 11 million between 1993-94 and 2009-10. Preliminary 2011-12 results suggest that the number of poor before food transfers did fall very sharply by 72 million in the next two years to 330 million. Nonetheless, this was 22% more than the 270 million who remained poor after food transfers in 2011-12, and the importance of such transfers continued to grow.

Moreover, food transfers averaged 7% of out-of-pocket MPCE of those who remained poor in 2009-10 and in 2011-12. Corresponding receipts in 1993-94 and 2004-05 were less than 2% and 4%. The enhanced effect of food transfers was therefore even larger in the case of distribution sensitive poverty measures. The poverty gap would have been 40% higher in 2011-12 without these transfers, against 31% in 2009-10, 14% in 2004-05 and only 5% in 1993-94. The squared poverty gap would have been 59% higher without these in-kind food transfers in 2011-12, against 45% in 2009-10, 20% in 2004-05 and only 7% in 1993-94.

Such large increases in the impact of food transfers on poverty reduction may seem to contrast with recent literature

that focuses on leakages. But our estimates of leakage are in line with consensus: e g, that 40% of PDS grain did not reach PDS users in 2009-10 and, though reduced from 55% in 2004-05, such leakages were higher than in 1993-94. Also, our poverty results are based on estimates which imply that food transfers received by the poorest 40% were only 28%, 25%, 35% and 32% of public expenditure on MSP/PDS/MDM in 1993-94, 2004-05, 2009-10 and 2011-12, respectively. Thus, the poverty impact of in-kind food transfers falls short of the counterfactual benchmark of a costless distribution of the entire MSP, PDS and MDM expenditure in the form of untargeted cash transfers. But, as in case of physical leakage, transfer efficiencies that had reduced with PDS targeting in 1997 improved significantly after 2005.

Our poverty results also look better because we include MDM which is much more transfer efficient than PDS. The incidence of this was nationally insignificant till it was expanded under Supreme Court orders in 2001. This expansion, rather than the shift to TPDS, explains the improved impact of food transfers on poverty reduction from 1993-94 to 2004-05. In 2004-05, MDM had roughly the same impact on poverty as PDS but at only quarter the cost. However, subsequent MDM expansion has had little additional effect on poverty although public expenditure on this rose from 0.21% to 0.36% of GDP. Yet, MDM draws less criticism than PDS because its purpose is not seen as poverty reduction but to reduce classroom hunger, improve pupil attention and to increase school attendance. On the other hand, criticism of PDS has, if anything, become louder in recent years although almost the entire large improvement in the poverty reducing impact of food transfers after 2004-05 was due to this. Our results show that 30% of total reduction in the poverty head-count ratio and 52% of reduction in squared poverty gap during 2004-05 to 2009-10 is attributable purely to PDS, 2% and nil to MDM, and the rest to increases in out-of-pocket expenditures due to growth or other anti-poverty schemes.

Of course, part of this very large PDS contribution was because 2009-10 was a year of severe drought. But, since a vital role of PDS in food security is to cope with drought and high food price inflation, this is a matter that should be noted rather than played down when evaluating whether PDS is effective or not. Instead, much of the recent criticism of the PDS ignores all the other functions of the MSP-PDS system, such as price stabilisation or support, and bases itself only on leakages data mainly from 2004-05. Although it admits counter-examples such as Tamil Nadu and Chhattisgarh, these are seen to be exceptions that are unlikely to have much general relevance. The overall tenor is that the PDS is so irremediably inefficient that it is vital to look for alternatives; and there is a sense of urgency that the NFSA should not commit entirely to expanding this inefficient and costly system.

The all-India picture in this paper puts matters in perspective. The shift to targeting in late 1990s had led to shrinkage of PDS customer base and triggered a deterioration of PDS efficiency. This bottomed out about 2004-05, after which some states extended PDS entitlements and most improved its functioning so that many who had stopped using PDS returned to it as market prices rose. The number of households buying PDS grain went up by 86% from 2004-05 to 2009-10 and grain actually received by them doubled from 13 to 26 million tonnes, with leakage steady at 16 million tonnes. Nonetheless, since MSPs were high and procurement exceeded sales, public stocks doubled; and almost the entire increase in the centre's food subsidy was the cost of higher MSP, procurement and stocks. Given MSP policy, expansion of PDS reach by states converted costs already incurred into much improved poverty impact. The alternative would have been even larger stocks, more inflation and doubtful savings. MSPs and stocks have increased further since then and most estimates of the costs of further PDS expansion are therefore exaggerated and at least some are plainly wrong.[27]

PDS Efficacy

In fact, the main lesson from all this is that PDS efficacy is more if more people are satisfied enough to use it. On this too, critics' assumption that PDS always functions poorly is contradicted by recent beneficiary surveys that find post-2005 revival. For example, a 12-state NCAER study by Kumar (2010) reports high satisfaction levels for most indicators, from quality of grain and service to adherence to quantities and opening and also on "meeting distress", in all states except Bihar. Khera (2011b) reports similar results from a nine-state study, noting further that 80% of respondents considered PDS "very important" in their lives and 98% at least "quite important"; and that a large majority prefer in-kind food to cash transfers, again except in Bihar.

We have not studied cash transfers since NSS consumer surveys do not contain any information on them. However, we have examined whether the PDS impact on calorie intakes is any different compared to an increase in out-of-pocket MPCE by the cash value of the PDS transfer. The procedure used was to fit a calorie demand function, but the analysis remains preliminary in absence of good instruments for actual PDS use as there was no NSS data on PDS entitlements except in 2004-05. However, our simple calorie demand function was robust to sample selection and we find strong statistical evidence that: (a) access to PDS increases calorie intake even without transfer; and (b) that a PDS transfer equal to 1% of out-of-pocket MPCE increases calorie intake by around twice as much as a 1% increase in out-of-pocket MPCE. Comparing actual to predicted intakes without the PDS, we find the PDS raised the calorie intake of the population as a whole by about 6% in 2009-10. This contribution had declined from 4% in 1993-94 to 3.5% in 2004-05 but increased with PDS revival.

This is surprisingly strong support for the activists' position since usual consumer theory holds that the effect on food and calorie intake of a PDS transfer should be the same as an equivalent income increase, at least for the overwhelming majority who supplement PDS by buying from the market. Our estimates do not imply that PDS transfers are non-fungible, but the results are quite dramatic on what it would cost in cash transfers to maintain existing calorie intake if PDS was ended. By our estimate of income elasticity of calorie intake around 0.4, this would require cash transfers of about 15% of MPCE in 2009-10. This is over three and a half times the actual MSP/PDS expenditure of the centre plus states in that year. If correct, the PDS written off by critics is contributing even more to sustain nutrition than to reduce poverty: it is considered very important in their lives by

those who actually use it and is probably a far less costly nutrition intervention than alternatives involving only cash transfers.

Of course, all this is subject to caveats. We have not examined any particular cash transfer proposal and there may be legitimate econometric issues regarding our parameter estimates. But a significant suggestion from our results is that PDS is more than just an income transfer. It may be helping and nudging beneficiary households to resist pressures to divert food expenditure to other uses that Deaton and Dreze (2009) have captured in the form of downward shifts in calorie Engel curves. Analysis of this non-parametric evidence of substitution from food to non-food, whether due to prices or changing preferences, also suggests that PDS matters.

While the average downward Engel shift in calorie intake (excluding from MDM) from 1993-94 to 2009-10 was by about 15% for the entire population, this was only 8% for those who bought PDS cereals but over 20% for those with no PDS purchase at all. The latter had higher calorie intakes in 1993-94, when cereal purchase from PDS was largely confined to cereal deficit areas, but by 2009-10 this averaged 10% lower compared to those at similar incomes but had PDS access. Calorie intakes of those with PDS access at the official Tendulkar poverty line averaged only the rock-bottom FAO minimum of 1,800 calories in 2009-10, down about 100 calories since 1993-94. But the downward shift was thrice as much for those without PDS access, and the MPCE level at which their calorie Engel curves crossed the FAO minimum in 2009-10 was 35% higher than the poverty line. If these are any indication at all of what the situation would be without PDS, the proportion of people with below 1,800 calorie intake could rise to over 50% from less than 40% actually in 2009-10. The proportion below 2,200 calories could go up from about 70% to 80%.

Cash Transfers Would Accelerate Calorie Intake Decline

The above is a stark reminder of the extent to which calorie intakes have actually declined at every level of real income, even for the poor. Moreover, since downward Engel shifts are evident even for calories from non-cereals, there is little indication of improvement in dietary content except through higher incomes. None of these and many other "shifters" of calorie Engel curves are fully understood and require further research, but PDS does appear to mitigate the process. Our analysis suggests that replacement of MSP-PDS expenditures by cash transfers would accelerate the ongoing downward shift in calorie intake even if this lowered leakages and allowed larger reduction in measured poverty. Such contrary movements along the two dimensions of income poverty and nutrition adequacy are already evident in the "calorie puzzle" and is at the core of the old normative debate on whether to revise poverty lines with price indices that reflect revealed preferences of the poor or to anchor these to calorie intake norms.

With malnutrition very high, any further fall in calorie intakes from already low levels is more than a normative issue since this also risks future economic growth through its effects on health and productivity. But people do adapt to lower intakes, ill-effects are slow to show, and nothing catastrophic has happened so far except in rare cases when states and markets have both failed. Indeed, despair and complacency both abound on malnutrition which remains relatively intractable because while everyone has a view on it, few care to analyse the behavioural issues involved. This is true about matters such as child feeding and why we Indians so neglect sanitation, preferring to spend on things rather than to end open defecation. This may also be true of PDS which most ordinary people see as adding only to cereal consumption but which most economists evaluate by assuming validity of a one period, one person model of household behaviour that predicts equivalence of cash and PDS transfers.

Our evidence rejects both these conclusions. PDS transfers are not spent entirely on cereals or even food, but more is spent on food from PDS transfers than from equal additional cash. Moreover, evidence seems to suggest that calorie intakes can increase with assurance of PDS access even if PDS cereals are not actually bought. This possible role of PDS as insurance against food shocks would imply that the value of PDS is more than of transfers through it. This would also mean that extending such assurance more widely could bring greater benefits at the same cost if, for example, the NFSA had larger coverage at somewhat higher prices than as presently planned.

However, all these are details that may undergo revision on further research and, in any case, ours was a study of existing in-kind food transfers and not an assessment of the NFSA or any alternative to it. Nonetheless, since PDS will mainly be only repackaged at lower central issue prices under the NFSA, three points are worth reiterating in the context of the ongoing debate that has focused mainly on the costs involved.

First, there has been large expansion of PDS coverage with much improved efficiency after 2004-05. Almost the entire increase in official PDS offtake of over 18 million tonnes between 2004-05 and 2011-12 is captured as additional PDS purchase by the NSS. Also, more than 80% of the entire rise in MSP-PDS cost during this period (at most 0.15% of GDP, both centre and state) is reflected in NSS data as improved PDS transfers received by beneficiaries. This very high level of transfer efficiency at the margin is why the PDS could contribute very significantly to poverty reduction, particularly in 2009-10, and means that it is no longer as leaky as it is often portrayed. Moreover, this better efficiency was at least in part a result of the widened reach that almost doubled PDS access. Fears that NFSA expansion will increase leakage are thus highly exaggerated.

Second, the PDS looks even better when judged in terms of its effect on calorie intake. Our analysis shows strong evidence that it delivers more on this than its transfer content and that it might be important as a safety-net that meets distress. This warns against an idea mooted in course of the NFSB/NFSA debate: that cash transfers can be an alternative to the PDS for food security. There are of course technological and financial innovations that can improve PDS functioning and transportability, e g, point of purchase transfers with biometric swipe cards. But it would be dangerous to view these separately from consumption behaviour and production incentives or as substitute for physical grain operations, i e, to maintain both adequate stocks in all locations at all times and a network of dedicated outlets to distribute this.

Third, much of the additional PDS costs being projected on account of the NFSA are already being incurred. Against average actual PDS offtake of 50 million tonnes (including from ad hoc allotments) during the last three years, total PDS commitment under the NFSA is 54 million tonnes so that very little additional grain flow is involved at normal 95% offtake and all of this can be accommodated within present procurement levels. The additional cost to the centre is therefore almost entirely limited to cheaper costing of the grain presently being sold at APL and BPL prices. This works out to less than the Rs 19,000 crore officially projected. Further, a number of states already give more entitlements than proposed in the NFSA and currently bear the additional subsidy. The additional NFSA cost to the centre in these cases is only a transfer from the centre to the states, with corresponding savings on PDS by the states.

Nonetheless, the NFSA 2013 is not perfect and in fact may satisfy almost nobody. On food security, its legal commitment is limited almost entirely to access, with only best endeavour promised on availability and absorption. On availability of cereals, let alone of other food items, it does not even commit to adequate stocks for all at all places and at all times; and government is allowed to get away with cash payments if it fails to ensure supply. On absorption, matters relating to safe drinking water, sanitation and health are all relegated to a simple list of goals for progressive realisation. Even the rights it confers on access are not clearly justiciable since it is neither universal nor sets criteria for eligibility. Although the number it will give rights to is double those currently classified BPL/AAY, NFSA entitlements will cover only 67% of households against about 85% who currently have a ration card. Moreover, since entitlements will be restricted to whosoever a state may select subject to numbers set by central government, the certainty on food security it provides to beneficiaries may only be marginally more than under presently administered systems and schemes.

This is not surprising since the NFSA is based on existing arrangements and, except to constitute a state-level grievance redress mechanism and specify the number of those entitled as well as low PDS grain prices for the next three years, it does not go beyond Supreme Court orders on the right to food mandamus. Thus, right to food activists have got legislation but not hugely more in it than what they had already got in court orders. Implementing departments have managed to minimise their own legal responsibilities and those sceptical of the entire system have also got a foot in. For example, although there is a chapter on the crucial issue of TPDS reforms, this is merely a list to progressively endeavour along some often contrary directions. This, of course, includes doorstep delivery of grain to TPDS outlets, the use of technology to prevent diversion and preference to public bodies in licensing of fair price shops, but this also includes "cash transfer, food coupons, or other schemes, to the targeted beneficiaries in lieu of foodgrain entitlements". The future of the MSP-PDS system thus remains open even after the Act. This paper should therefore be seen as part of an ongoing debate whose purpose should be to delineate the distinction between poverty reduction and food security and make interventions regarding the latter more effective for the poor.

NOTES

1 The number of beneficiary children was officially put at 11.8 crore (8.4 crore primary and 3.4 crore upper primary) in 2009-10. For the same year, the NSS 66th round reports 2,140 crore meals consumed, i e, 182 meals per beneficiary child. This suggests negligible leakage in terms of meal numbers. However, calories shown added by MDM are based entirely on imputation made by NSS which need not reflect actual intake. In fact, there is almost certainly some overestimation since the NSS imputed the same calorie content to all meals taken away from home, whether consumed by children or adults and whether purchased or free. This is another reason for not going deeper into MDM calorie intake.

2 See Jha and Ramaswami (2011) who place these losses from "excess cost" at 28% of total subsidy in 2004-05, against 43% loss from "illegal diversion" or leakage, with only 29% reaching beneficiaries.

3 In a simple one period, one consumer model, while lower PDS prices may have some additional substitution effect for households who meet the need for PDS food articles entirely from PDS, only the income effect of the implicit transfer matters for households who supplement PDS by market purchase.

4 This is ultimately an empirical issue since activists question both the one period and one consumer assumptions of the simple model and other models can be constructed to replicate activists' priors.

5 Imputed MDM calories are excluded since these have measurement errors and are not part of proper household consumer demand. However, all equations in this paper were also run with MDM calories and transfer. Except for a MDM dummy, other coefficients remain similar as reported here.

6 This choice of the price variable is consistent with the way market prices were used earlier in calculating transfers. This variable is also similar to the price variable used by Gaiha et al (2012).

7 Previous studies that have reported calorie elasticity to consumption expenditure within the 0.2-0.6 range include Knudsen and Scandizzo (1982), Radhakrishna and Ravi (1992), Subramanian and Deaton (1996), Dawson and Tiffin (1998), and Gaiha et al (2012).

8 By definition log(MPCE_PDS)=log(MPCEMRP) +Lntransferratio. Thus, in fits above, the coefficient on LnrealMPCEMRP (say, α) can be interpreted as elasticity of calorie intake to MPCE_PDS due to out-of-pocket expenditure with Lntransferratio held constant. Similarly, coefficients on Lntransferratio (say, β) can be interpreted as calorie elasticity to MPCE_PDS changes that result only from in-kind PDS transfers. The null hypothesis is $\alpha=\beta$. Note, however, that the actual elasticity of calorie intake to PDS transfer is β*(MPCE_PDS-MPCEMRP)/MPCE_PDS which depends also on share of PDS transfers in MPCE. Since these shares are very small (see Table 2 in Part I of the paper), a high β is consistent with low elasticity of PDS transfers as reported by Kochar (2005) and Kaul (2013).

9 For example, Subramanian and Deaton (1996) placed the expenditure elasticity in the range 0.3 to 0.5. Their elasticity to household size was -0.16 and they reported 6% higher intake by the self-employed in agriculture. Gaiha et al (2012) report rural expenditure elasticity falling from 0.42 in 1993-94 to 0.36 in 2009-10 and urban from 0.24 to 0.22, their cereals price elasticity ranges from -0.05 to -0.17, and their elasticity to household size is -0.03 rural and -0.10 urban.

10 For example, in a study of PDS wheat users, Kochar (2005) reports additional positive PDS effect on calorie intake after controlling for MPCE. She also stresses FPS access, arguing that this reduced for BPL in 1999 with the targeting out of APL. Her results seem to imply that a PDS transfer equal to 1% of MPCE increases calorie intake by 6%. Similarly, for PDS rice users, Kaul (2013) reports estimates that imply over 4% increase in calorie intake per 1% of MPCE in PDS transfers. Interestingly, she reports half of this calorie increase comes from non-cereals. These studies do not fit calorie demand functions directly but exploit other estimation strategies to instrument PDS. Suitable instruments for PDS variables are a problem since NSS does not provide entitlements data (except in 61st round). Therefore, emphasis in this paper was to find a basic demand model that is robust to sample selection.

11 Compare percentage increases in calorie intake due to PDS transfers as reported in Table 3 with PDS transfers as percentage MPCE as reported in Table 2 of Part I of this paper.

12 All central expenditures on MDM and part of its food subsidy are routed through state budgets.

13 However, as against this, some non-budgetary items are also relevant, particularly FCI borrowing. The outstanding on this is large when stocks are high and government delays reimbursement of holding cost. But this is cyclical in nature and not necessarily permanent. The outstandings were Rs 8,366 crore, Rs 28,846 crore, Rs 25,276 crore, Rs 4,085 crore, Rs 8,605 crore, Rs 14,489 crore, Rs 37,274 crore and Rs 48,014 crore at end-March 1997, 2002, 2004, 2005, 2009, 2010, 2011 and 2012, respectively, when corresponding central pool stocks were 16.4, 51.0, 20.6, 18.0, 35.6, 43.3, 44.3 and 53.4 million tonnes.

14 Panel 2 of this table compares NSS MDM transfers with state revenue expenditures on "Nutrition" and centre's total expenditure on

MDM plus subsidies incurred by FCI on account of MDM, ICDS and SC/ST hostels. The centre's other ICDS spending is not included since very little of this is on meals. Panel 3 compares NSS PDS transfers with states' non-plan revenue expenditures on Civil Supplies and Food Storage & Warehousing plus centre's total food subsidy minus carrying cost of buffer stocks and FCI subsidies on non-PDS sales. Panel 4 simply sums Panels 2 and 3.

15 Not only was it not possible to prune state expenditures similarly, the division between PDS and MDM is not clear cut on the state side so that the treatment in Table 5 – to book expenditures on Civil Supply and Food Storage and Warehousing against PDS and that on Nutrition against MDM – is only an approximation. In particular, it is possible that part of "Nutrition", especially in 2011-12, is state PDS subsidy.

16 That this was so over time and across States was shown in Part 1 of the paper. This is also true between programmes (e g, decentralised versus FCI procurement and role of states in the PDS vis-à-vis MDM).

17 The most influential recent paper on the subject is Jha and Ramaswami (2011), based on 2004-05 data.

18 This also includes subsidies on grain provided to the MDM, ICDS and SC/ST hostels that are included under food subsidy in Table 4. However, some states book extra subsidy that they give on PDS under "Nutrition" and this may overstate states' spending on the ICDS and MDM, particularly after 2009.

19 In addition, it must be noted that costs have also been brought down because of decentralised procurement. Sales from decentralised procurement (DCP) by states accounted for 64% of the increase in PDS offtake during 2004-10 with unit subsidy on DCP about 85% of that paid to FCI.

20 See last column of Table 5 (and the note to the Table) for details of NSS transfers received by the bottom 40% as share of centre plus state expenditures after deducting procurement incidentals.

21 Annual grain procurement averaged 65 million tonnes during triennium ending (TE) 2012-13, up from 38 million tonnes during TE 2003-04. Against this, NFSA commitments as enacted are at most 62 million tonnes: 54 million tonnes for the PDS and 8 million tonnes for welfare schemes and other sales. The PDS component here includes 5 kg per capita per month for 67% of the 2013 population, protection of 35 kg per month per household for AAY beneficiaries and also, as assured in Parliament, protection of grain supply to states whose current TPDS offtake exceeds NFSA entitlements. Annual offtake from welfare schemes currently averages about 4 million tonnes and, since NFSA only commits existing norms for MDM and ICDS, there are no additional legal obligations under these welfare heads. The 8 million tonnes provided above follows the Economic Advisory Council (2011) and should suffice not only for any likely welfare expansion, including meals for pregnant and lactating mothers, but also for open market sales. The latter is not a legal commitment but has averaged about 3 million tonnes during the last three years. However, no further stock build-up is required from present high levels (see below).

22 Stocks were 73.9 million tonnes on 1 July 2013, 42 million tonnes more than the present buffer norm of 31.9 million tonnes (including strategic reserves) for this date. However, norms need to be revised up in view of the NFSA. A study by NCAP (Chand and Birthal, 2011) for the Department of Food and Public Distribution placed the requirement for buffer and operational stocks with NFSB flows on 1 April in the range 30 to 39 million tonnes, for 1 July at 42.7 to 52.9 million tonnes, for 1 October at 33.9 to 41.5 million tonnes and that for 1 January at 33.9 to 42.3 million tonnes. Actual stocks were 59.8 million tonnes on 1 April 2013, 73.9 million tonnes on 1 July 2013, 66.6 million tonnes, on 1 October 2012 and 66.7 million tonnes on 1 January 2013, i e, higher by an average of about 23 million tonnes on these dates.

23 Food subsidy is calculated as sales quantity multiplied by the excess of economic cost over the sales price. Government reimburses this and the carrying cost of buffer stocks, although sometimes with a lag. However, excess of procurement over sales that leads to increase in stocks over buffer norms is financed by off-budget borrowings against stock valued at purchase price till sold. See note 15 for details.

24 Cereal production increased by 30 million tonnes (or at 2.8% per annum) from 205 million tonnes in TE 2007-08 to 235 million tonnes in TE 2012-13. But stocks increased even more, by 40 million tonnes from 19.8 million tonnes on 1 April 2008 to 59.8 million tonnes on 1 April 2013. This was because offtake was contained below procurement which, as a result of relatively high MSP hikes, increased from 38 million tonnes in 2007-08 to 73 million tonnes in 2012-13. Since the NFSA sets per capita commitments that are already being met, this allows scope to moderate future MSP increases so as to bring procurement growth in line with that of population (1.65% per annum during 2001-2011).

25 Valued at FCI's unit carrying cost of Rs 612.27 per quintal for 2013-14(BE), there would be annual savings of about Rs 12,250 crore on carrying costs alone if stocks were brought down by 20 million tonnes. Similar savings of about Rs 11,600 crore would have accrued in 2012-13 if procurement costs had been 10% lower, say by fixing MSPs 4% less, which in turn would have reduced the quantity procured by about 6%. Since MSPs were hiked by 10% and 15% for wheat and paddy that year, this would still have allowed reasonable MSP increase; and since procurement was 73 million tonnes that year, this would still have exceeded NFSB requirement with 6% reduction.

26 With grain quantity already adequate in terms of both stocks and flows, the main additional cost relates to pricing all PDS grain at AAY prices which will increase unit subsidy by about Rs 2.75 per kg. This extra annual subsidy would be about Rs 17,000 crore if this is applied to the 62 million tonnes required not only for the legally committed 5kg/person/month to 67% population and to protect the AAY but also extended to include all welfare schemes and grandfather existing state allocations.

27 For example, Surjit Bhalla (2013) observes that 45% of households bought PDS cereals in 2011-12 and PDS purchases were 2.1 kg/month/person. This implies that improvements noted above continue. The percentage of households buying PDS cereals was 23% in 2004-05, 30% in 2007-08 and 39% in 2009-10; and PDS quantities were 1.0, 1.4 and 1.8 kg/month/person. He then claims that since NFSA targets 67% of population, coverage would increase 50% and since it entitles 5 kg/month, per capita requirement would increase 240%, leading to 360% increase in total requirement! He errs on per capita requirement since NFSA entitlements are per beneficiary which by his own figures is already 4.7 kg/month (2.1/.45). Also, a 50% coverage increase is only half what was actually achieved after 2004-05. During this period, the centre's food subsidy as % of GDP rose from 0.80% in 2004-05 to only 0.81% in 2011-12. His error here is to ignore efficiency gains of PDS expansion, e g, reduction in leakage from 55% to 35%.

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