Paper 2

Prices, Price Indexes and Poverty Counts in India during 1980s and 1990s: from CPIs to Poverty Lines?

Amaresh Dubey

(*North Eastern Hill University, Shillong and NCAER, New Delhi*)

and

Richard Palmer-Jones

(*University of East Anglia*)

Abstract

In the first of this series of three papers we criticised the consumer price indexes based on unit values calculated from the unit records of the NSS Consumer Expenditure Surveys (NSS CES) which have been used to calculated new poverty lines for Indian states by Deaton and Tarrozi, 1999, Deaton, 2003a. This second paper examines the calculation of poverty lines using these Unit Value Consumer Price Indexes (UV CPIs). We suggest that using UV CPIs to account for temporal change and spatial variation in prices in the production of poverty lines does not appear to be a good strategy. Here we point out what we see as a flaw in the method used to calculate Poverty Lines for different states and sectors from a single base Poverty Lines. Further, we argue that neither UV nor official price indexes represent true cost of living indexes because they ignore "environmental" variables that differ between domains and affect the transformation of consumption into well-being. This results in problems of comparability suggesting that the PLs that can be calculated from household expenditure surveys such as the NSS CES do not correspond to the same level of well-being in different domains and thus do not generate poverty measures that compare differences in ill-being rather than differences in the yardstick by which well-being is assessed. A thorough overhaul of poverty line calculations is required, but welfare comparable poverty lines cannot be based on normative calorie requirements. In the third paper in this series we give our "best" CPIs and those that arise from "robust" methods of poverty comparison using stochastic dominance techniques. Unfortunately, on theoretical grounds neither our poverty calculations nor the use of robust methods in their usual form overcome the problems identified here, and there we give evidence in support for this contention in that other indicators of well-being are not well correlated with these poverty counts and comparisons.

Address for Correspondence:
Richard Palmer-Jones
School of Development Studies
University of East Anglia, Norwich
NR4 7TJ, UK
r.palmer-jones@uea.ac.uk

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Prices, Price Indexes and Poverty Counts in India during 1980s and 1990s: from CPIs to Poverty Lines?

1. Introduction

In the first paper in this series (Dubey and Palmer-Jones, 2005a) we argued that unit value consumer price indexes (UV CPIs) that have been used in recent studies to account for temporal change and spatial variation in prices in India (Deaton and Tarrozi. 1999, Deaton and Dreze, 2002, Deaton, 2003a, 2003b) have several limitations that could potentially introduce errors in the calculation of poverty lines and hence in the calculation of poverty. We have specifically pointed out that UV CPIs are sensitive to cleaning rules; unit values for most frequently used items are multimodal as a rule rather than exception; there are significant differences in UV CPIs by expenditure groups; there are intra-state differences (by NSS regions) as well as between towns of different size; and that the unit values are not prices of items of constant place, form or quality utility, and are not very similar to the prices used in official price index calculations. In this paper, we extend our argument by looking at how poverty lines (PL) are computed from these price indexes, and find further problems.

Broadly two methods are used to calculate PLs for different domains[1]. Either a base poverty line is defined for each geographical, sectoral, or social domain, at a point in time, and then inter-temporal CPIs are applied to account for inflation in the cost of living. Or one can have a base global PL to anchor all other PLs; then spatial CPIs are applied to account for spatial differences in prices for the base period, and inter-temporal CPIs are applied to these social or geographical PLs as in the first methods[2]. In India, official estimates of poverty are based on the second method using base rural and urban PLs computed by a food energy intake (FEI) method[3] for 1973-4, adjusted by state spatial CPIs estimated for 1960 inflated to the base year by state and sector specific CPIs (the consumer price for agricultural workers (CPIAL) for the rural sector and that for

[1] A domain for this purpose is a defined social group in a given geographical area for a given period of time.

[2] Deaton uses a slightly different procedure for inter-temporal PL calculation as explained below. The results using his method do not substantially differ from the method described.

[3] This involves using a regression between calorie intake and household expenditure, and finding the expenditure at which the regression predicts that a normative calorie allowance can be expected to be achieved. A variant on the FEI method is to compute a cost of basic needs (CBN) poverty line for each space/time domain (see Ravallion, 1992 and 1998, for descriptions of these methods); in related work we show the equivalence of FEI and CBN poverty lines once the cost per calorie is constrained (see also below).

industrial workers (CPIIW) for the urban)[4]. These state/sector OPLs for 1973-4 were then inflated by the state CPIALs and CPIIWs up to the present[5].

These OPLs have recently been criticised by Deaton and Tarrozi, 1999, as out of date and inappropriate (see also Rath, 2003). Using unit value (UV)[6] CPIs (UV CPIs) computed from National Sample Survey Organisation's household expenditure surveys Deaton updated the calculations of D&T to produce new State and sector poverty lines (PL) for the 43rd, 50th and 55th Rounds (1987-8, 1993-4 and 1999-00 financial years respectively) of the Indian National Sample Survey (NSS) (Deaton, 2003b).

Deaton anchors all his poverty lines for both rural and urban sectors in the All India Official Rural Poverty Line for the 43rd Round ($OPL^{ai,r}_{43}$). Given a set of CPIs with the all India rural prices and expenditure shares in the 43rd round as base, a set of PLs can be calculated in a number of ways from this anchor, but this does not make much difference (since all the UV CPIs are computed from the same data). Deaton links the state rural PL to all India rural PL and the state urban PL to the state rural PL[7]. Between rounds Deaton inflates the all India Rural PL by his all India Rural 50th vs. 43rd CPI (giving $DPL^{ai,r}_{50}$), and then calculates state rural and urban PLs in the 50th round from this in the same way as for the 43rd Round; and similarly for the 55th Round (Figure 1).

In this paper we initially follow Deaton's method of computing PLs in India except that we use the $OPL^{ai,r}_{38}$ as the base. Later we modify Deaton's method to take account of both the different share of household expenditure covered by items included in the UV CPI in urban compared to rural areas (and between states and over time), and for differential state and temporal indexes of items not included in the UV CPIs (non-UV items).

Our main objections to Deaton's method are:

1) there is no justification for using the all India OPL43r as the base from which to calculate other PLs – we discuss below whether a base can be derived from calorie consumption norms as widely practised;
2) Deaton's method is not a convincing way to compute urban poverty lines from a rural base PL because it does not treat the higher urban share of non-UV items in

[4] Datt and Ravallion 1998a; Datt and Ravallion, 1998b, and Fan; Hazell, and Haque, 2000; Fan et al., 2000, and some other use slight adjustments to OPLs to allow for firewood prices.

[5] Details of this method are given in GoI, 1993, and 1998; we have been able to replicate to an adequate degree of accuracy the results reported there using readily available data. The major anomaly between Deaton's results and the OPLs - the case of rural Andhra Pradesh – arises because of the exceptionally low CPIAL for rural AP between 1960 and 1973/4.

[6] Unit Values are calculated by dividing total expenditure on an item by the total quantity consumed. Many household surveys provide these data for items that constitute a substantial proportion of total reported consumption. Unit Values are not prices, although they may approximate them (Dubey and Palmer-Jones, 2005a).

[7] An alternative method of compute urban PLs would be to compute the All India Urban PL using the $CPI^{aiu,air}_{43}$ and then compute state urban PLs using the $CPI^{sn,aiu}_{43}$; we do this.

an appropriate manner; we propose a different method for computing inter-sectoral PLs;

3) states are not appropriate geographical units for which to compute PLs; we compute them for NSS Regions (clusters of districts within states), as well as states;
4) The urban sector as a whole is not an appropriate geographical unit since both Unit Values and Average Budget Shares vary by town size; we compute PLs for towns of different size;
5) Deaton (as he acknowledges) neglects the possibility that CPIs of items that are not included in the UV CPIs (accounting for between less than 30% to more than 50% of household expenditures), are different from UV CPIs for the same domains. We explore this using item group sub-indexes from the CPIAL and CPIIW, but reject their use because they are not convincing indexes, partly for the reasons the official indexes as a whole are not satisfactory;
6) Deaton's and the official method of computing PLs neglect "environmental" variables which are likely to have a crucial role in the determination of the welfare that can be derived from a common real expenditure level (poverty line) in different geographical units and at different time, and hence are not likely to capture the real expenditure required to attain a given standard of living in different domains.

We argue that it is impossible to make welfare comparisons (count the poor or otherwise aggregate ill-being) using consumption aggregates from household expenditure surveys and consumer price indexes that neglect this last feature. This may go some way towards explaining the apparent contradictions between (a) trends in poverty computed in this way, (b) the apparent declines in calorie consumption at constant real poverty lines and concomitant increase in calorie poverty compared to money metric poverty, and (c) the apparent non-decline in nutritional status notwithstanding the apparent rise in calorie poverty. In the next paper we will produce our calculations of poverty using our "best effort" CPIs and compare them with the results of "robust" poverty comparisons using stochastic dominance tests (Atkinson, 1987) and with some other indicators of well-being; we will argue that as currently practised these "robust" methods are not robust to the sorts of criticisms raised in this and its preceding companion piece and the poor association between other indicators of well-being and poverty supports this contention.

The rest of this paper is laid out in the following fashion. In section 2, we discuss the issues surrounding choice of base PL. In section 3, we discuss the issue of urban poverty lines. Section 4 is devoted to the discussion of non-UV CPI component of the CPIs and its implication on poverty counts. Section 5 draws some conclusions and previews the next paper.

2. Choice of Base/Anchor PL

In India the base PL has been fixed for two domains, rural and urban, separately for 1973-74 by a Task Force in 1979 constituted by the Planning Commission, Government

of India (GOI, 1979)[8]. These official poverty lines use aggregate price indices to update the base poverty lines (GOI, 1997).[9] Other researchers, for example Dubey and Gangopadhyay, 1998, and Jain and Tendulkar, 1995, use price indices constructed for the population around the poverty line,[10,11]. Deaton and Tarrozi, 1999 and Deaton, 2003a, have used CPIs computed from the Unit Values and (democratic) average budget shares that can be computed from the unit records of the NSS Consumer Expenditure Surveys (CES). It is obvious that the use of different price indices will yield different PLs even if the base year PL is the same.

The choice of base PL as well as of CPIs makes a large difference to PLs and hence poverty counts because poverty counts are largely determined by the shape of the cumulative distribution of expenditure (CDF) up to the specific poverty line; for most states in India poverty lines intersect their CDF where it is steep. A higher or lower base PL will make a difference to the poverty counts in the base period and later, and it can affect the relative poverty counts between domains if the shapes of the CDF of per capita expenditures differ[12].

Deaton did not provide any justification for using OPL43r as the base; that is the choice was "arbitrary" (Deaton, personal communication). Both PLs and poverty counts would be significantly different if they had been based on all India Urban Poverty line (OPL43u) as anchor rather than the OPL43r; the former was 165.58 and the latter 115.2. Using OPL43u as base would give an all India rural poverty line computed by Deaton's method of 148.6 rps. per capita per month if we used Deaton's 43rd round all India rural-urban deflator (1.114)[13]. This would give significantly higher poverty counts in both sectors, but it might now appear that OPLs for the rural sector are far too low rather than, as D&T would have it, that OPLs for the urban sector are far too high. However, the difference between urban and rural poverty counts would still be much lower than when using the Official Poverty Lines.

Deaton also points out that his inter-round deflators are generally lower than those implicit in the OPLs as one might expect from the latter being Laspeyres indexes while

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[8] These PLs were later endorsed by the Lakdawala Committee reported in 1993 (GoI, 1993, 1998).

[9] The GOI (1993) clearly recommended use of price indices for the population around the PL. However, the Government of India turned down this particular recommendation. See GOI (1997) for details.

[10] See Pradhan and Saluja (1998) for a survey of literature on this issue. See GOI (1997) and GOI (1993) for methodology used in the official poverty calculation.

[11] The region-specific price indices were derived by Minhas et. al (1988, 1991). They also worked out region specific price indices for the middle range of population. The Expert Group (GOI, 1993) did recommend use of the region specific price indices for the middle range of population. However, the GOI, Planning Commission did not accept it (GOI, 1997).

[12] However, Dubey and Gangopadhyay (1998) who used six such poverty lines to check for the sensitivity of poverty measures to various poverty lines found that ranking of the states/region is unchanged for different PLs.

[13] Using the OPL43r as base Deaton's the all India Urban PL is 128.3.

the former are Tornqvist indexes (the difference in inter-round inflation is especially large between the 43rd and 50th Rounds). This would suggest that if the intention is to have poverty counts that are comparable to earlier (say 1970s) counts one should anchor the set of PLs as early as possible. If one intends to use the UV CPIs that would mean using the 38th Round since it is the earliest for which unit record data are available[14]. However, the question remains as to what one should base the 38th Round anchor PL on?

The base PL (or poverty lines if one uses the first method given above) needs to be justified by reference to the socially acceptable standard of living which is supposed to mark the cut-off between the poor and non-poor for the time/space unit that is specified. The PLs and poverty counts derived from the PLs calculated by applying CPIs to this base should then be examined for plausibility. We suggest that for some geographic units the poverty aggregates computed by Deaton as well as those by the PC, are not plausible and that their trends over time are not reliable. Some Indian States have poverty counts that appear inconsistent with other indicators of ill-being. Over time we also find inconsistencies between poverty measures and other indicators of well being that suggest that for at least some areas and periods it the estimated fall in poverty may underestimate the fall in ill-being (our evidence is given in the next paper).

The poverty lines for urban areas that stem from Deaton's method are too similar to those for rural areas, and we now turn to the urban-rural comparison. However, before we do this it should be noted that, because our overall conclusion is that monetary poverty measures are unreliable for theoretical reasons, it would be unwise to believe that our poverty indicators enable comparisons of ill-being measured at the same level of welfare rather than differences due to the yardstick by which ill-being is being measured. That is, our poverty lines for different domains may not reflect the expenditures required to attain a fixed real standard of living in these different domains. We elaborate on these ideas in section 5.

3. Urban Poverty Lines[15][16]

The methods used to compute relative rural and urban poverty lines by both Deaton and the Planning Commission, and the use of OPL43r rather than OPL43u as the anchor by Deaton, both have significant problems; we address the former issue in this section. The Planning Commission method depends on a base period calculation that lacks credibility, and because of the application over a long period of CPIs that have deficiencies to some of which D&T drew attention. We do not address the PC method further. Here we discuss Deaton's method of anchoring urban relative to rural PLs and whether a justification for

[14] to maintain continuity with Deaton's calculations one could deflate the OPL43r to the 38th Round using the all India rural UV CPI but if t the 43rd-38th deflator followed the same pattern that Deaton found between 43rd and 50th rounds, the 38th round PLs would be higher than by using the OPL38r as anchor.

[15] These arguments could equally apply to rural poverty lines if calculated by Deaton's method from an all India urban anchor.

[16] A slightly more detailed treatment is can be obtained from the authors.

this can be obtained explicitly from another method of producing PLs based in normative calorie requirements.

Deaton's method seems to assume that households whose expenditure is equal to the urban poverty lines that he calculates have the same standards of living as those at the rural poverty lines that he calculates (i.e. he is not apparently using different yardsticks in rural and urban areas). Since the UV items used to compute the urban from the rural PLs are largely food (a small share is fuel and light) one might assume that to attain the same standard of living in both sectors the same real food consumption is required (i.e. allowing only for changes in prices and patterns of food consumption between sectors, which is what Deaton's Tornqvist indexes do. One might then expect that the shares of UV and non-UV expenditure in urban areas would be the same as for rural households, again only allowing for different patterns of food, fuel and light consumption and prices among the UV items. However, the share of expenditure on non-UV items in urban areas is significantly larger than in rural areas at the same real per capita expenditure (using any plausible deflator). Indeed the Engel curve of expenditure on UV items for rural areas is nearly everywhere above that for urban areas even when expenditures in urban areas are deflated by the urban vs. rural UV CPI deflators (figures 2a to 2c) [17].

A similar pattern was noted by Ravallion and Bidani, 1964, while comparing urban with rural expenditure patterns in Indonesia, and also by Ravallion and Sen, 1996, for Bangladesh. This became the basis for their critique of the food energy intake (FEI) method of computing poverty lines. Ravallion and Bidani attribute the difference to differences in relative prices, lower calorie requirements for work in urban areas, and tastes, among other factors (op cit.:80-1). Another explanation could be that there are some commodities that rural households obtain "free" (or perhaps requiring only labour to produce) that have to be paid for in urban areas[18]. As an alternative they and other authors associated with the World Bank[19] have proposed a cost of basic needs (CBN) method for calculating comparable poverty lines; we discuss these below. Housing is an obvious example of a good that must be paid for in urban areas but is often "free" for rural consumers (or at least not considered a relevant item of expenditure by the NSSO). Indeed, when we include housing in the UV CPI indexes, the rural-urban difference in PLs rises considerably compared to those given be Deaton[20]. Appendix 1 gives a simple model of Deaton's method of computing urban poverty lines in the presence of free rural provisioning of some non-food goods.

The CBN method anchors PLs in cost of consuming a bundle of foods that provide a normative calorie level, and add a variable allowance for non-food expenditure derived from the non-food Engel curve estimated for the relevant domain. This non-food share is

[17] We observe a similar pattern in most of the states but report it only for three states as examples.

[18] Ravallion and Bidani also mention "publicly provided goods".

[19] Wodon, 1997; World Bank, 1998; Ravallion, 1998; Lanjouw, 1999; World Bank, 2002; Tarp et al., 2003.

[20] One could note a number of problems here with the reporting of housing expenditures in the NSS compared to "best practice' (see Deaton and Zaidi, 2002)

significantly greater in urban than rural areas. However, Deaton provides no such justification for his method of computing urban relative to rural PLs, and it is left unclear as to how urban consumers distribute their expenditure between UV and non-UV items. In his method either one assumes that the urban consumers at the poverty line consume an equivalent bundle of UV items and a much lower share on non-UV items than one finds in the data for urban consumers at this level of expenditure, or they spend less on UV items and more on non-UV items. The first case is empirically inconsistent with the data, and the later is theoretically inconsistent with the CBN method. Deaton, while generally supportive of the economists' idea that consumers can attain the same standard of living with very different patterns of expenditure that they choose for themselves, is elsewhere not dismissive of calorie based methods of setting a single measure of welfare for "individuals close to poverty" (Deaton, 1980:2), or in "poor countries such as India, where food makes up a large share of the budget" (Deaton, 1997:143). However, his calculations of new PLs in India suggests that that he would adhere to the second account – that urban consumers at his PLs consume less UV items and more non-UV items – since this is consistent with the behavioural patterns he reports, even if this appears inconsistent with his views mentioned above. Nor does he justify or refute the implication that the lower UV item consumption – mainly food – in urban areas at his PLs can be justified by our understandings of human nutrition.

Further, as noted above, Deaton's conclusion that official urban poverty lines are too high compared to rural is reversed if one takes the OPL43u as the anchor. Thus, instead of anchoring the poverty lines in OPL43r one uses the all India official urban PL as the anchor (OPL43u). Now it would appear from Deaton's method that the Official State **rural** PLs were too low relative to the **urban** PLs[21]. However, Deaton proposes no justification for using the OPL43r as opposed to the OPL43u or any other base PL; in reality it is the urban-rural differential that D&T should suggest is too small rather than one too high or the other too low.

Now consider the implicit level of expenditure on non-UV items in urban areas in Deaton's method. If the implicit expenditure in rural areas on UV items is:

$$UVCPI43^{sn,ai}{}_{r} * OPL43r * UVSHARE43^{sn}{}_{r},$$

Where $UVCPI43^{sn,ai}{}_{r}$ is the UV CPI of state n vs. all India for the rural sector, and $UVSHARE43^{sn}{}_{r}$ is the share of expenditure in state n on UV items in the rural sector.

Then the implicit expenditure on non-UV items is

$$nonUVEXP43^{sn}{}_{r} = UVCPI43^{sn,ai}{}_{r} * OPL43r * (1-UVSHARE43^{sn}{}_{r})$$

The implicit urban expenditure on non-UV items will then be

$$UVCPI43^{sn}{}_{u,r} * nonUVEXP43^{sn}{}_{r}$$

[21] "Note also that my urban poverty lines are on average only 15 per cent higher than my rural poverty lines as opposed to nearly 40 per cent in the official lines, so that because I start from the same *rural* estimates for 1987-88 as the Planning Commission, I estimate urban poverty in all years to be much lower. As argued in Deaton and Tarozzi (2000), the urban to rural price differentials that are implicit in the official lines are quite implausible, so that the estimates in this paper are to be preferred to the official counts."(Deaton, 2003a: 362

$= UVCPI43^{sn}_{u,r} * UVCPI43^{sn,ai}_{r} * OPL43r * (1-UVSHARE43^{sn}_{r})$

where $UVCPI43^{sn}_{u,r}$ is the UV CPI of the urban vs. the rural sector of state n Clearly this implies the same non-UV items share in urban areas as in rural areas adjusted only for the difference in urban vs. rural prices unless one allows the urban consumers at the poverty line to significantly reduce their expenditure on UV items (and thereby reduce their calorie consumption). But the data show the non-UV share of expenditure is considerably higher (UV items share lower) in urban than in rural than in urban areas.

It could be argued that the relative shares of UV and non-UV items in urban compared to rural areas does not matter, since people are free to choose their patterns of expenditure; the Deaton method computes the cost in urban areas of buying the bundle of goods purchased by households in urban areas whose real welfare is at the same level as rural poverty line regardless of the pattern of consumption they adopt.

Alternatively, one can argue that the Deaton method is better interpreted as applying the UV CPI to the UV share of the OPL43r expenditure, and adding an allowance for non-UV items which he calculates as the same non-UV shares multiplied by the same UV urban vs. rural CPI. In urban areas the Deaton method applied only to expenditure on UV items computes the cost in urban areas of UV items with the same real value as the rural consumption of UV items. In this case one might argue that the allowance for non-UV items should be the inverse share of UV items in each sector separately, on the assumption that households which can just purchase the UV items in urban areas need to spend their share of non-UV items on goods to the value of these other items to attain an equivalent standard of living. Thus this method becomes:

$DPL43^{sn}_{u} = OPL43r * UVCPI43^{sn,ai}_{r} * (1/UVSHARE43^{sn}_{u})$

$DPL43^{sn}_{u}$ is the Deaton PL of state n in the urban sector for the 43rd Round. This is the method used by the main alternative way of setting poverty lines in poor countries, the CBN method, as noted above[22]. It is also our method of computing urban PLs (although these remain subject to further concerns discussed below[23].

It is generally accepted that those who escape poverty consume more food, fuel and light than those who are poor; it is also accepted that the goods to which one must have access to escape poverty is relative to the consumption standards of the society in which one lives. One can suggest a number of reasons why people with the same real poverty line command of food, fuel and light (which is what UV CPI computes and then adds a proportionate allowance for other items), may consume more non-UV items in towns than in rural areas. Basic necessities like shelter may be more costly; access to common pool goods which can be gathered "freely" (if one discounts the time and effort required to gather them for the purposes of computing poverty) – such as water, fuel, thatching

[22] the CBN method and the way it calculates the non-food contribution to poverty lines are discussed below.

[23] The argument that urban occupations and demographic structures enable an equivalent level of welfare as the rural sector due to differences in needs is discussed below.

and other building materials, etc. – may have to be paid for in towns. Further, the expenditure on non-UV items may change over time perhaps because social standards change, as well as changes in the environment and relative prices in ways that differ between sectors.

As noted above, the urban vs. rural UV CPIs compute the cost of a bundle of UV items in towns compared to rural areas; but, using the same share of non-UV items in towns as in rural areas as Deaton does, to give urban PL expenditure levels at which urban households consume more non-UV items than rural households. Are they at the same level of welfare if they are consuming less food, fuel and light and more of other items? This could happen because the prices of UV items are higher in urban areas (which they generally are as the higher UV CPIs or urban areas attest). But this would not be the usual interpretation of the effect of higher UV prices in urban than rural areas; while substitution of cheaper non-UV items for more expensive UV items in urban areas compared to rural may partly offset the higher prices, one would generally expect that this entailed a lower level of welfare since they are consuming fewer basic food commodities.

Deaton's method does make some allowance for higher prices in urban areas of non-UV items because it assumes that the CPI of non-UV items is same as for the UV items; hence, when compensated for the higher prices they face urban consumers with the same tastes and environment as rural consumers would be at the same position on the same utility curve as rural consumers. However, this does not explain why urban consumers at the price compensated urban poverty line consume less UV and more non-UV items. This could be because their tastes or needs differ, perhaps as some have suggested, because urban households require less energy for work than rural households which are more dependent on manual labour (or they have a higher dependency ratios implying proportionately lower per capita food needs); in this case substitution might have taken place along the same poverty level utility curve[24]. Or it could be because some non-UV items of expenditure are more expensive in urban areas – for example housing[25] – or are more necessary because of the environmental (lack of common pool resources), which have to be substituted by purchased items – domestic water for example - and, or social pressures to consume perhaps because of the sheer availability of these goods (education and, or health expenditure) makes it necessary for urban consumers to purchase them at the expense of food. Using Sen's argument that absolute poverty in sphere of capabilities entails relative poverty in the sphere of goods (the linen shirt on Sundays in England, and the leather shoes in Scotland, phenomena), this might lead to the conclusion that having to consume some non-UV items in urban areas which are not essential in rural areas, means a higher consumption expenditure is necessary in the former to attain an

[24] We show elsewhere that naïve calculations suggest differences in energy expenditure due to differences in demographic composition and on occupations in urban compared to rural households using an implentation of the FAO/WHO/UNU, 1985, method are unlikely to account for the difference in food consumption that are suggested by the Deaton urban relative to rural poverty lines.

[25] When housing is included in the UV CPIs a significant rise in the UV CPIs of urban areas relative to rural occurs.

equivalent welfare level. We return to this issue below when we discuss the methods of computing expenditures on non-UV items.

3.1 Towns of different size

In Deaton's calculations of UV CPIs (and poverty lines) the urban-rural price differential is around 15 percent, which is not plausible. The Fifth Pay Commission (GOI, 1996) suggests that housing, which is excluded from the UV CPIs, is six times costlier in the four largest cities in India than in rural areas and small towns. While housing may be a small part of the expenditure of poor rural households, it is far from insignificant for poor urban households and should be included when establishing urban poverty lines that are comparable to rural ones. Including housing in the UV CPIs raises the urban relative to rural CPI by 5 – 15%[26].

Further, as noted in our first paper in this series the UV CPIs within the urban sector increase significantly with town size. Typical urban costs vary by size of town, with metropolises being more expensive than smaller towns, with small rural towns having costs of living nearer to their rural hinterland. This is supported by our evidence, which clearly shows UV CPIs are higher in larger towns for all social groups and at each round. Further, average budget shares of UV items included in the UV CPIs are often smaller as town size rises.

4. CPIs of non-UV items

The items included in the UV CPIs are predominantly food, tobacco and intoxicants, and fuels and light. Excluded are footwear and clothing, health, education, travel, housing, durables, and miscellaneous goods. Deaton assumes that these have the same CPIs as the UV items.[27]. We have used CPIs of sub-groups of the Consumer Price Index for Agricultural Labourers (CPIAL) and that for Industrial Workers (CPIIW) to assess this assumption and to compute the spatial and inter-temporal deflators of non-UV items.[28]

Official indexes for non UV items are available for both urban and rural sectors in the form of sub-indexes of the relevant CPIs (CPIAL, CPIIW, and National Rural and Urban

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[26] Housing is eliminated from the calculation of UV CPIs for several reasons. It is hard to quantify housing and there are likely to be significant quality differences between rural andurban housing making the different commodities. The NSS does not include many observations of expenditure on rural housing (see below), and makes no imputation for the value of housing. With too few observations and large differences in expenditure, simple cleaning rules would eliminate this item from the UV CPI calculation as unreliable. However, one can argue that the basic characteristic of housing is shelter, in which case other quality differences may be of little relevance. However, where important utilities (piped water, gas, drainage) that are not otherwise included in the comparison, come as part of housing, this is not a very satisfactory assumption.

[27] We discuss this method in detail below. Our method for computing the UV items CPI is not identical to that employed by Deaton.

[28] In the CPI method used by the World Bank in its most recent Bangladesh poverty assessment (World Bank, 2002), the inflation between rounds is computed by combining a type of UV CPI computed from the Household Expenditure Surveys with official CPIs from the BBS for non-UV items. While this is similar to our method we find their choice of Official non-UV CPIs (national/sectoral CPIs) unsatisfactory.

CPIs). It is possible to use these sub-indexes of the official CPIs to compute indexes for non-UV items. For India these indexes and their sub-indexes are published for each state. They combine a sub-Index for Food with sub-Indexes for other items which vary over time and between sectors. The CPIAL has sub-groups for Food, Fuel & Light, Clothing, Bedding & Footwear, and Miscellaneous items; the CPIIW has a separate sub-group for housing which is included in the miscellaneous sub-group in the CPIAL. Each of the sub-group indexes are themselves compiled from sub-sub-indexes. The Food and Fuel and Light indexes correspond to UV items, while the clothing, bedding, footwear, and miscellaneous indexes (and housing index in urban areas) correspond to non-UV items. One can use these sub-indexes to adjust the inter-round UV CPIs, and to adjust the state rural vs. urban CPIs, provided one is prepared to accept the cumulated difference in sub-group indexes since their base as a good indicator of the difference in costs of non-UV items between states[29].

Clearly, the objections to using OPLs extend to the use of sub-indexes of the official CPIs – namely being Laspeyres indexes with old weights. A New Series of the CPI for agricultural and rural labourers with base 1986-87=100, was released with effect from the month of November, 1995. The Old Series used weights from1960-1. For the CPIIW the old series up to 1987/8 used 1960/1 weights while the new series used 1982 weights. Deaton points out that neither agricultural or rural labourers nor industrial workers may be representative of the poor. However, he uses the population democratic average budget shares as weights, which may be no more representative of the poor, rather than the expenditure patterns of populations around the computed poverty lines. While for the 1980s for states with a high proportion of poor this may not matter greatly, for states with fewer poor (Punjab, Haryana, etc.), and later rounds where average poverty rates have fallen well below 50% of the population, this would result in even less appropriate weights.

Figures 3 shows some evidence of spatial differences between the UV sub-group and the non-UV sub-group of the CPIIW for the 38th Round. Clearly the pattern is highly varied, a similar variability across states is found for the other rounds but with different patterns. Correlations of UV CPIs and these sub-group CPIs (both UV and non-UV sub-groups) are generally not significant. Figure 4 shows the differential inflation at the all India level between these two sub-groups. The results for the sub-groups of the CPIAL are not greatly different either spatially or over time (Figures 5 & 6)[30]. Hence, the evidence suggests that the prices of non-UV items should not be assumed, as Deaton does, to have the same relation to the base prices as for the UV items (because what evidence we have, which is not good, suggests that the spatial patterns are different), but it is not clear that official indexes for non-UV sub groups can be used instead since we cannot rely on these sub-group indexes to reflect the real spatial and temporal differences in prices of non-UV items consumed by the poor without further work. The official non-UV indexes do not

[29] We have already noted (as did Deaton) that judged by the UV CPIs the CPIAL and CPIIW for some states (AP is the most significant) became seriously out of line between 1960 and 1973-4 compared to other states.

[30] Evidence on this and related matters can be obtained from the authors.

inflate/differ between base and comparison units in the same way as the UV CPIs, but then the Official food combined with fuel and light sub-group indexes do not inflate/differ in the same way as UV CPIs either. This is not surprising as it was doubt over the validity of official indexes that led to the use of UV CPIs. It is not likely then that official non-UV indexes are any better and their use, as by the World Bank, 2002 (which does not note this apparent contradiction), should be treated with great caution. The appropriate way forward to address these issues is perhaps to compare UVs of some non-UV items in the CES for which UVs can be computed with the prices on which official sub-group indexes are based (see below). But what is really required is a careful "anthropological economic" exploration of the costs of urban relative to rural living for those who can be considered poor, and then the construction of suitable survey instruments to provide data on the relevant variables.

5. Neglect of "environmental" variables

We turn now to perhaps the most serious problems with computing poverty lines from UV CPIs derived from household expenditure surveys – the neglect of what are termed in the literature on Cost of Living Indexes, "environmental" variables. The ILO (ILO, 2004) includes demographic trends[31], public goods, and environmental goods as normally construed, under this term (Caves, Christensen L.R., et al. 1982; Diewert, 2001; ILO 2004; these differ between domains (i.e. geographical regions, social groups, and over time). In consumer theory, CPI, and poverty literatures, demographic variables are discussed under the headings of consumer equivalents and household economies of scale and are important in determining poverty lines (Townsend, 1979; Citro and Michaels, 1995; Lister, 2004). There are many unsolved problems in the estimation and interpretation of associations among expenditure, household size and composition in developing countries (Deaton and Paxson, 1998; Gibson, 2002, Gan and Vernon, 2003). We do not explore these further here except to note that this problem raises many similar issues to those raised here, that require to be addressed as much by alterations to survey practices and procedures as adjusted by econometric method.

That public goods and the quality of the environment can clearly make differences to the standard of living of persons, and are often acknowledged in the writings of development economists[32]. In addition to these variables, we add "culture" or "institutions" perhaps

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[31] i.e. household composition; since children, adolescents, adults and old people have different demands or needs, and there may be economies of scale in consumption of some goods, households with different composition and size require different expenditures to achieve the same utility level.

[32] A huge list of authors of such prescriptions could be produced, but since what is at issue is the gap between precept and practice I will quote only one exceptionally clear example. Francois Bourguignon, currently Chief Economist at the World Bank, writes:

> "This transformation process ["of private *endowments* … into *welfare*"] itself depends on various sets of parameters: public or community *infrastructure* (IFS), *market institutions* (MI) and associated parameters (e.g. prices), *non-market institutions* (NMI), *the technological constraints* under which households in the community are operating (T) and the *preferences* of the household among various techniques of production and among various outcomes." (Bourguignon, 2002:43; emphasis in original)

related in part to levels of education and the status of women. Culture affects behaviour which can affect the standard of living that can be achieved from a given bundle of goods and services consumed (or from the endowments underlying access to them), both through the household production function and through intra-household allocations of consumption. A society in which women are educated may be more effective in maintaining its health and therefore more efficiently convert foods into nutritional well-being. Similarly traditions with respect to cleanliness and hygiene may be important. And, a society where there is much domestic violence for example is likely to have more poverty for given real command of commodities than a society in which domestic life is more peaceful.

Following these ideas and the literature on Cost of Living Indexes, we suggest that the concept of poverty can be formalised as:

$$z = \min_{q}\left(q, p_q, e_{1,}, e_2 ... e_n, \bar{u} \right)$$

where q are the goods consumed, p_q are the prices of goods q, and $\bar{u}$ is the reference poverty level standard of living. ,e_1, e_2, ..e_n are other variables that are likely to affect the determination of u from the q goods consumed.

These "environmental" variables are not exhaustive of those that may affect the transformation of goods into well-being. For example, it neglects the implications of the physical effort required to produce goods or gain income to buy the goods consumed; an agricultural labourer, or miner, or other such manual labourer will need to consume more calories to produce income or goods than an office worker. The characteristics model of consumption (Gorman 1953; Lancaster 1966), and the household production model (Becker 1965; Pollak 1978) are relevant here (), as are models which include "productive consumption" (Suen and Mo, 1994), extended perhaps to allow for "effort intensity" (Palmer-Jones and Jackson, 1997, Jackson and Palmer-Jones, 1999). However, these approaches do not pay explicit attention to variations in intra-household allocations or to person specific characteristics that affect the transformations of goods available at household level to the welfare achieved by the individuals who make up that household (although developments of the bargaining approach to households can clearly contribute to our understanding of the intra-household distribution of well-being (Sen 1987; Haddad, Hoddinott, et al. 1997).

5.1 Entitlements and Capabilities

The entitlements and capabilities frameworks was proposed by Amartya Sen explicitly to address some limitations of the money-metric approach to poverty (Sen 1981, Sen 1985, Sen 1999), and can help here; combining these frameworks (Figure 7) shows that there are many transformations involved in the determination of capabilities from resources or consumption, that presumably should be taken into account in determining the expenditures required to achieve the reference level of well-being.

We can see that well-being – the attainment of basic capabilities - is related to consumption by a sequence of functions that include other variables besides goods available to the household from home production and or market exchange. We can summarise this framework by the assertion that capabilities are dependent on the consumption of private goods, public goods (from outside as well as inside the house), the environment and household technology, this latter summarizing the transformations of goods into commodities (or characteristics), their division within the household, and the personal functions transforming the commodities/characteristics to which an individual has access, into capabilities.

Since capabilities depend on goods and other variables, a measure based on goods alone will not be comparable if these other variables differ. This then makes any attempt to use a constant level of real consumption of goods a proxy for a constant level of capabilities or welfare unlikely to succeed except where public goods, the environment and household technology are constant.

All this suggests that we monitor other inputs into the capabilities functions, and the levels of functionings achieved, because the nature of the functions transforming inputs into capabilities (and functionings) are not well defined.

Furthermore, there is a host of economic work that can speak to the issue of poverty lines that has not generally been referred to in the poverty literature that we are aware of; we take up some of these topics in the conclusion.

5.2 New Goods and the Quality of Goods

In addition to those variables which can be included under the heading of the environment, we suggest that two other well known problems with calculating CPIs also stand in the way of computing PLs which reflect comparable standards of living, namely the issues of new goods and the quality of goods. Take the example of bio-medicine; among the poor perhaps the most dramatic improvements in the standard of living comes from immunisation, and relatively simple treatments of diahorrea and infections. As public health and medical knowledge has accumulated new commodities (anti-biotics) have become available, and their efficacy (or rather understanding of how to treat diseases) has improved, so that less illness occurs for lower private expenditure. Improved health improves the conversion of foods, and other items of consumption, into nutritional and probably cognitive status (Sen, 1999, among others). New domestic technologies can also have significant effects; for example shifting from wood fuel to kerosene, gas and electricity for cooking and light can have dramatic impacts on health, as well as the time and effort required in food preparation, and may also reduce illness related to exposure to wood smoke and so on.

Of course the story is not all favourable; the environment can deteriorate, as with pollution and environmental degradation, and new and more resistant diseases can emerge. Nevertheless, formal education or teachings through schools, NGOs, media, and so on, may have spread, for example, understanding of the aetiology of diseases and how

to avoid and treat them, improving the level of welfare that can be obtained from given commodities[33]. Some parts of the functions that determine some of these transformations of commodities into well-being will evidently come under the rubric of culture, and relevant dimensions of this will also vary between social and geographic domains and change over time.

Hence, even if all items of expenditure or consumption in the surveys were used in the calculation of UV CPIs, it would not necessarily result in PLs that support the same standard of living in comparison units. And, it has been claimed that, at least as far as public goods are concerned, it is possible to include them in the calculus of welfare (Ravallion, 1994) from HES (using hedonic and similar methods, as also with the environment) though this is not apparently generally done at least for developing countries as far as we can ascertain.

None of this would matter if it were possible to assume that the missing variables did not differ between the domains being compared, but this is clearly unlikely to be the case as casual knowledge of the realities of life in developing countries in recent decades makes clear. Most populations in developing economies have experienced significant structural social and economic changes. That the relevant structure of economies differs spatially and among groups, and changes over time is indisputable from casual observation. Some economies provide more public goods, have different environments, and different cultures (about which we will have more to say below)[34].

6. Conclusions and Policy Implications

In this paper we examine the question of calculating state level PLs from a single base PL. In the official methodology of calculating state-wise PLs, the Lakadawala Committee (GoI, 1993, 1998) recommended the use of state level price indices for rural and urban sectors applied to two base PLs (rural and urban). The state-level PLs derived in this manner were criticized by Deaton and Tarozzi on the grounds that it uses outdated Laspeyeres price indexes and hence is outdated and inappropriate.

Deaton uses All India Official Rural Poverty Line for the 43rd Round as base PL to calculate all India urban PL in 43rd round. He then links the state rural PL to all India rural PL and the state urban PL to the state rural PL. Between rounds Deaton inflates the all India Rural PL by his all India Rural 50th vs. 43rd CPI (giving $DPL^{ai,r}_{50}$), and then chains state rural and urban PLs at that round from this PL in the same way as for the 43rd Round. We find his methodology inappropriate for several reasons. First, the level of the base anchor makes a difference to poverty calculations; Deaton uses the All India Official Poverty Line for Rural areas (OPL43r) as the single base. Using this base Deaton argues that Official Poverty Lines for Urban areas are too high and hence urban poverty is overestimated. A very different picture would emerge if the all India Urban Poverty Line

[33] They may also affect intra-household distributions of goods leading to greater aggregate welfare if hitherto deprived members of households receive a greater share (or vice versa).

[34] see Dreze and Sen, 1996, for comparisons between states in India

(OPL43u) had been used; then it would have been the case that Official Rural Poverty Lines would have been too low, and hence rural poverty underestimated. Secondly, Deaton's assertion that the rural-urban differential in poverty lines is too great compared to the 15% or so that he estimates is thrown in doubt by other information that suggests a 35-40 percent difference. This can largely be explained by the variable share of household expenditure that the items included in the UV CPIs cover and the way Deaton computes PLs from these indexes. Allowing for the difference in the share of non-UV items between rural and urban areas raises urban poverty lines computed from UV CPIs relative to rural PLs but not as much as the official PLs. Thirdly, non-UV indexes are not always the same as UV indexes for the same domain, as assumed by Deaton, although the remaining problems with the non-UV indexes from official sources limit the significance of this finding. Fourthly, all these methods of computing PLs neglect "environmental" variables that are important in determining the standard of living and hence do not approximate Cost of Living Indexes.

We conclude this paper by arguing that when these "environmental" variables differ between domains, the "standard of living" that can be attained in different domains for given a real consumption will differ. This clearly raises the issue whether poverty measured without taking account of differences in these "environmental" variables is comparable with other indicators of well-being that we can expect to be closely related to poverty such as infant mortality rates, children's and women's anthropometry.

That setting a poverty line is beset with difficulties is not a particularly new claim; as Deaton points out "the conceptual and practical difficulties of the choice of poverty line mean that all measures should be treated with skepticism" (1997:144), and, a propos of CPIs, Deaton points out that they refer to "the measurement of quantities and prices that arise in the market [only]" (Deaton and Muelbauer, 1980:169)[35]. In a more detailed examination of this issue, Deaton and Zaidi, 2002, acknowledge the importance of publicly provided goods, including

> "education and health, … police, water, sanitation, justice, public parks, and national defense" and the difficulty of providing appropriate "shadow" prices[36].[37].

But this is dismissed on the grounds that

> "As with the imputation of leisure, we believe that imputations for public goods are likely to compromise the credibility and usefulness of welfare measures in general. None of which gainsays the fact that the documentation of who gets access to publicly provided goods and services, and whether these people are rich

[35] Ravallion makes much of the inevitability of "value judgments" in the setting of poverty lines, and the methods he suggests produce a range of poverty lines (Ravallion, 1992:2, 104, 111). However, it is not at all clear either on what basis these value judgments should be made, or that the range of PLs proposed in any way take account of the sorts of criticisms raised in this paper.

[36] this could be done with econometrics, or contingent valuation.

[37] They raise the issue of seperabilty of these goods and services, which would make leaving them out acceptable for measuring welfare But clearly some are not separable so one wonders what the purpose of raising this possibility is.

> or poor, remains an important element in the any overall assessment of living standards and poverty" (2002:17).

They go on to comment that:

> "It should be noted that there are some cases where the necessity to make some allowance for public goods cannot be avoided. The most obvious case is when making international comparisons where in one country, some good - health and housing are the obvious examples-is publicly provided or subsidized, while in the other it is obtained through the market. Even within a country, urban residents may have access to. Even within a country, urban residents may have access to subsidised hospitals, clinics, or "fair" price shops that are unavailable in the countryside ... done. It will sometimes be enough to be aware of the problem and its implication for certain types of welfare comparisons; in other cases, it will be necessary to try to revalue consumption at international or unsubsidized prices, even if such imputations carry a large margin of error" (op cit:17).

It seems fairly clear that comparisons between states and indeed sectors (or towns of different size) in India with very different levels and qualities of public goods, should be treated in the same manner as Deaton and Zaidi suggest is appropriate to international comparisons.

One cannot escape the conclusion that the current practices of setting poverty lines recommended for developing countries and as practised recently in India, do not generate expenditure levels in different domains that correspond to equivalent standards of living, nor that the assessments of poverty that have been based on them have been augmented with the sorts of information that have been suggested to address the acknowledged limitations of the methods. Nor do they correspond very well to the ways in which poverty is assessed and used in policy arenas in developed countries (see Citro and Michaels, 1995; Iceland, 2004, Lister, 2004[38]). It is unlikely then that poverty counts that are made in these ways will correspond very well with other indicators of well-being that may be considered less unreliable. We address this in the next paper. The question remains as to what the deflated welfare aggregates computed from HES mean in terms of welfare, and what is their value and how they should be used in the assessment of well-being.

[38] We will be addressing the issue of what one might learn from practices of poverty assessment in developed countries in another paper; an early draft may be obtained from the corresponding author.

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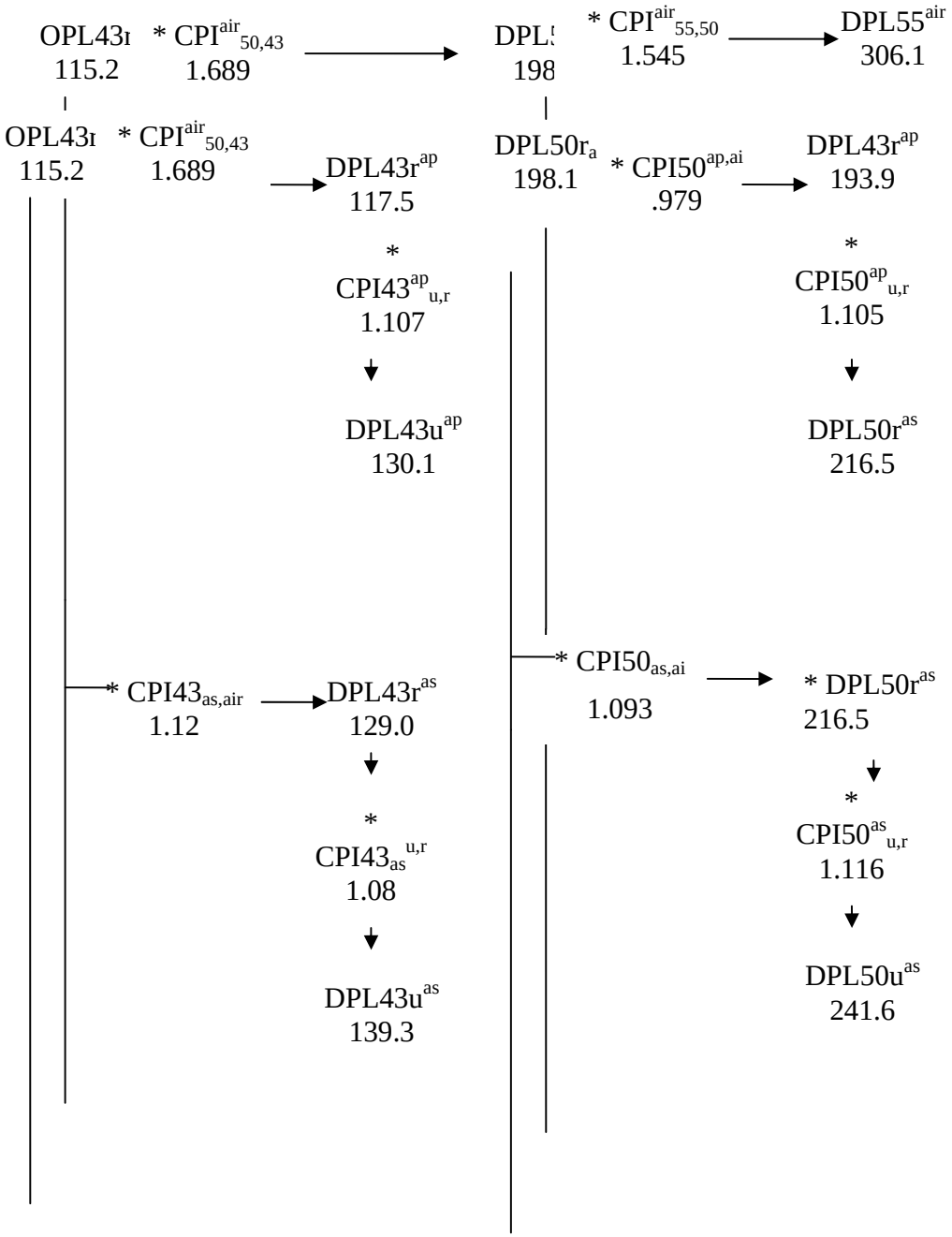


Note: ai = AllIndia, ap = Andhra Pradesh; as =Assam

Figure: 1: Deaton's Rural and Urban Poverty Lines, All India, Andhra Pradesh and Assam, 43rd – 50th Rounds

Figure 2a: Average Budget Shares by MPCE (AP, 43rd Round)

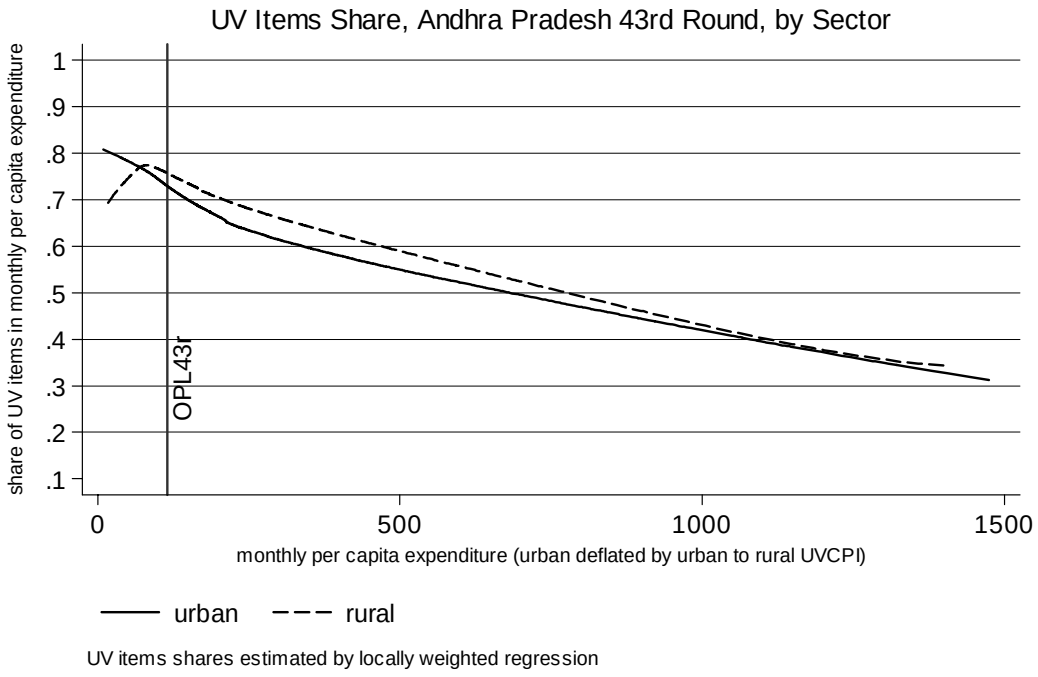


Figure 2b: Average Budget Shares by MPCE (Bihar, 43rd Round)

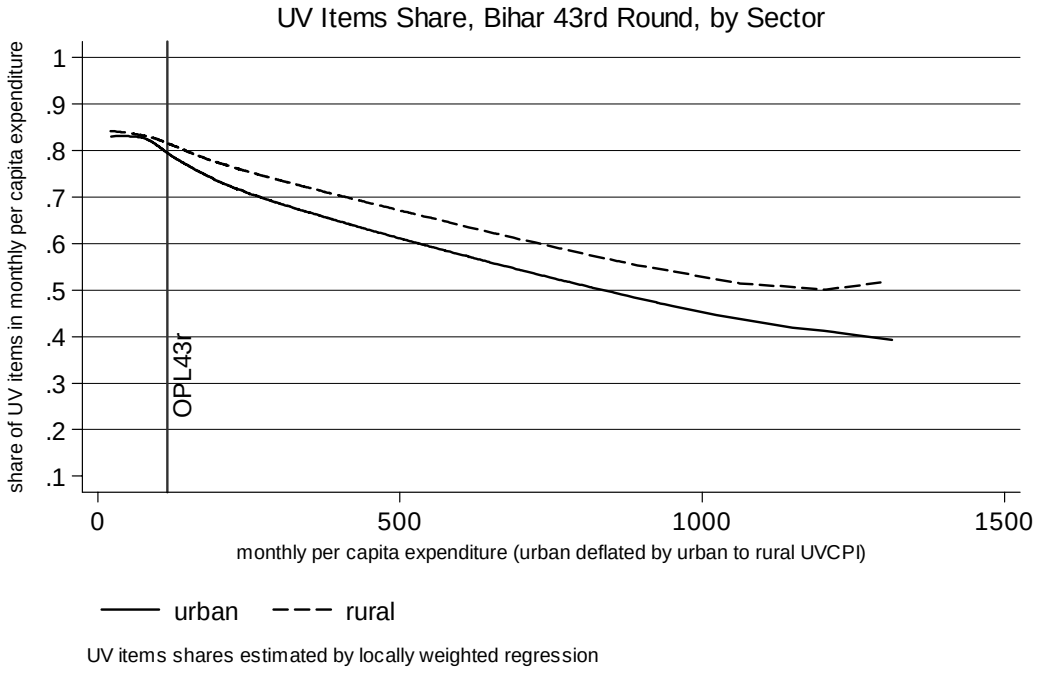


Figure 2c: Average Budget Shares by MPCE (TN, 43rd Round)

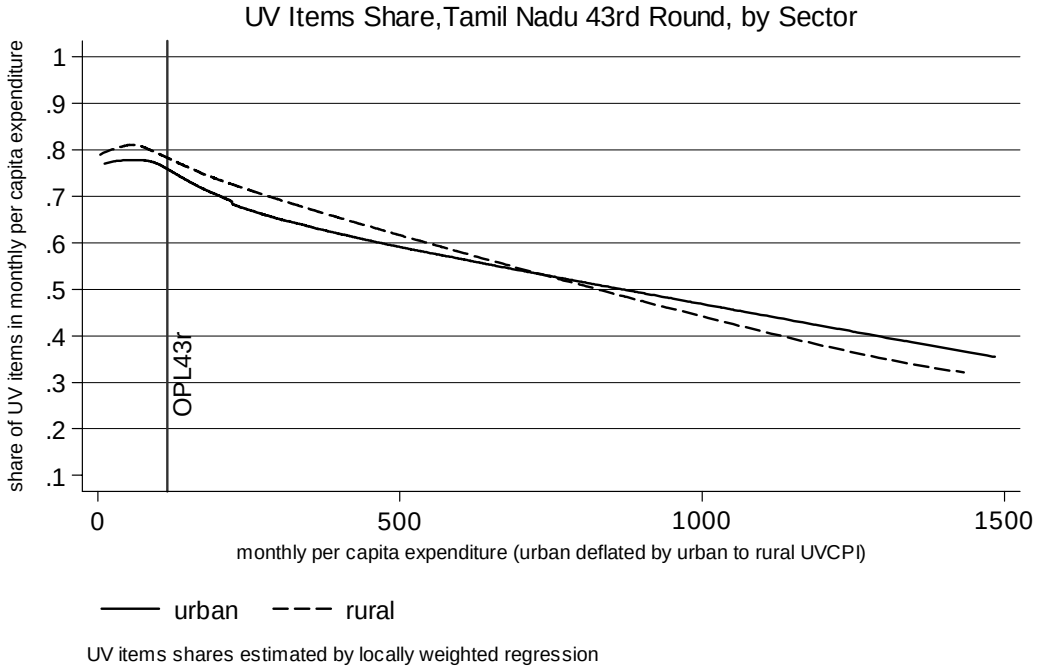


Figure 3: India: CPIs of UV and non_UV item Groups from the CPIIW by State, 38th Round

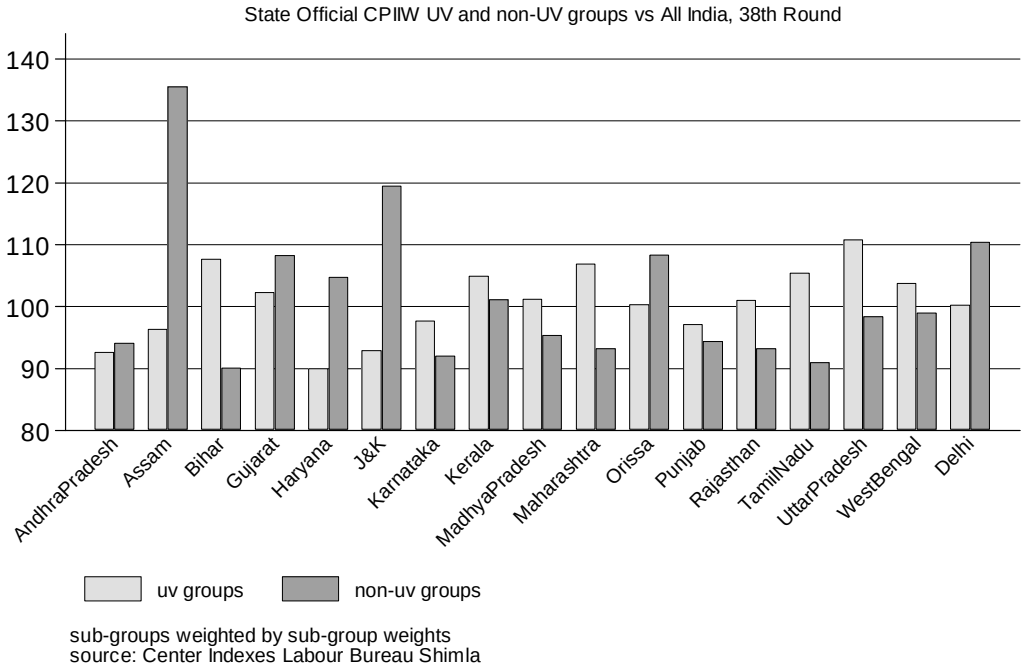


Figure 4: Growth of CPIs of UV and non-UV item Groups, CPIIW

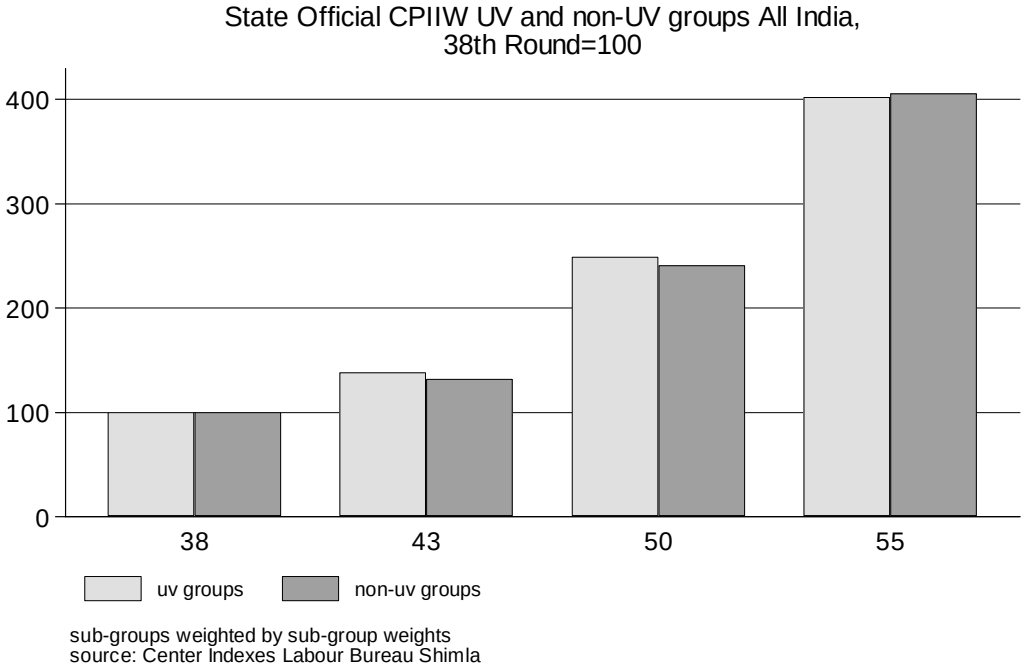


Figure 5: India: CPIs of UV and non_UV item Groups from the CPIAL by State, 38th Round

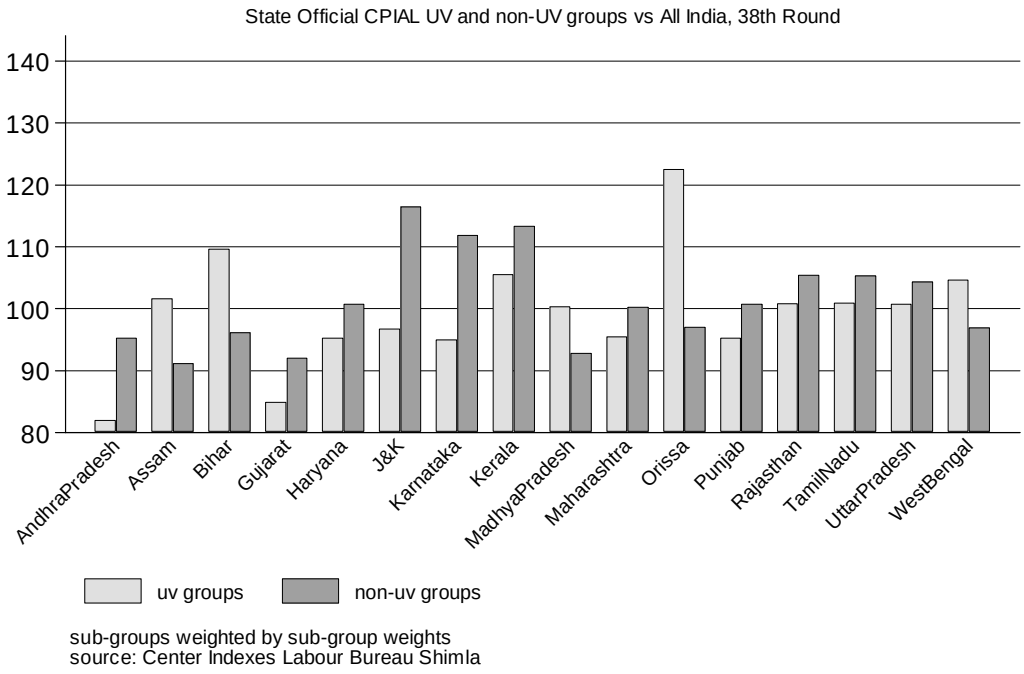


Figure 6: Growth of CPIs of UV and non-UV item Groups, CPIIW

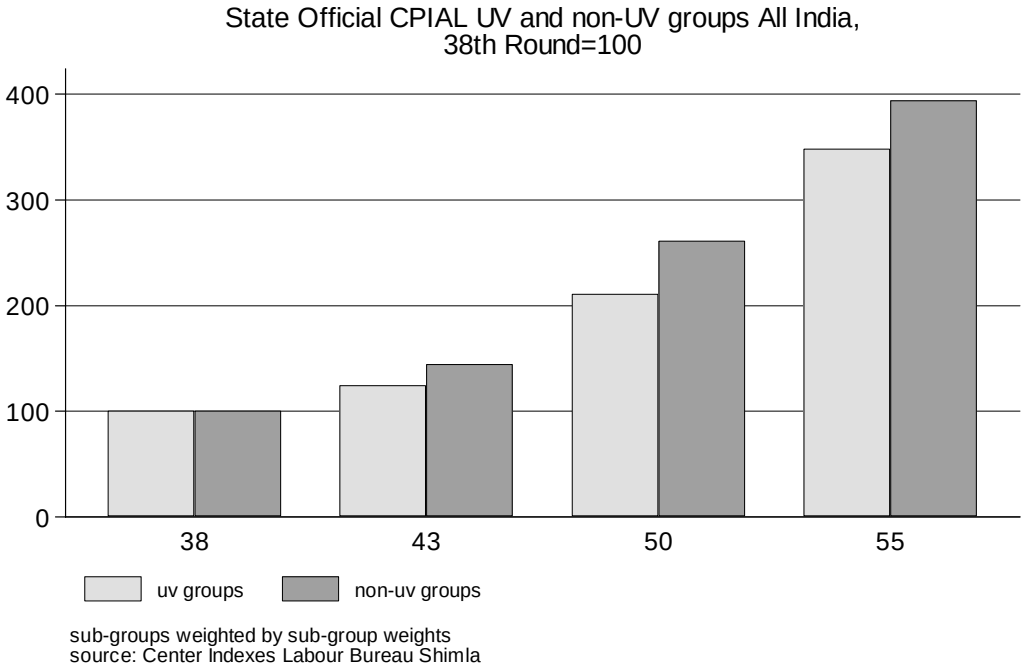


Figure 7: Entitlements and Capabilities

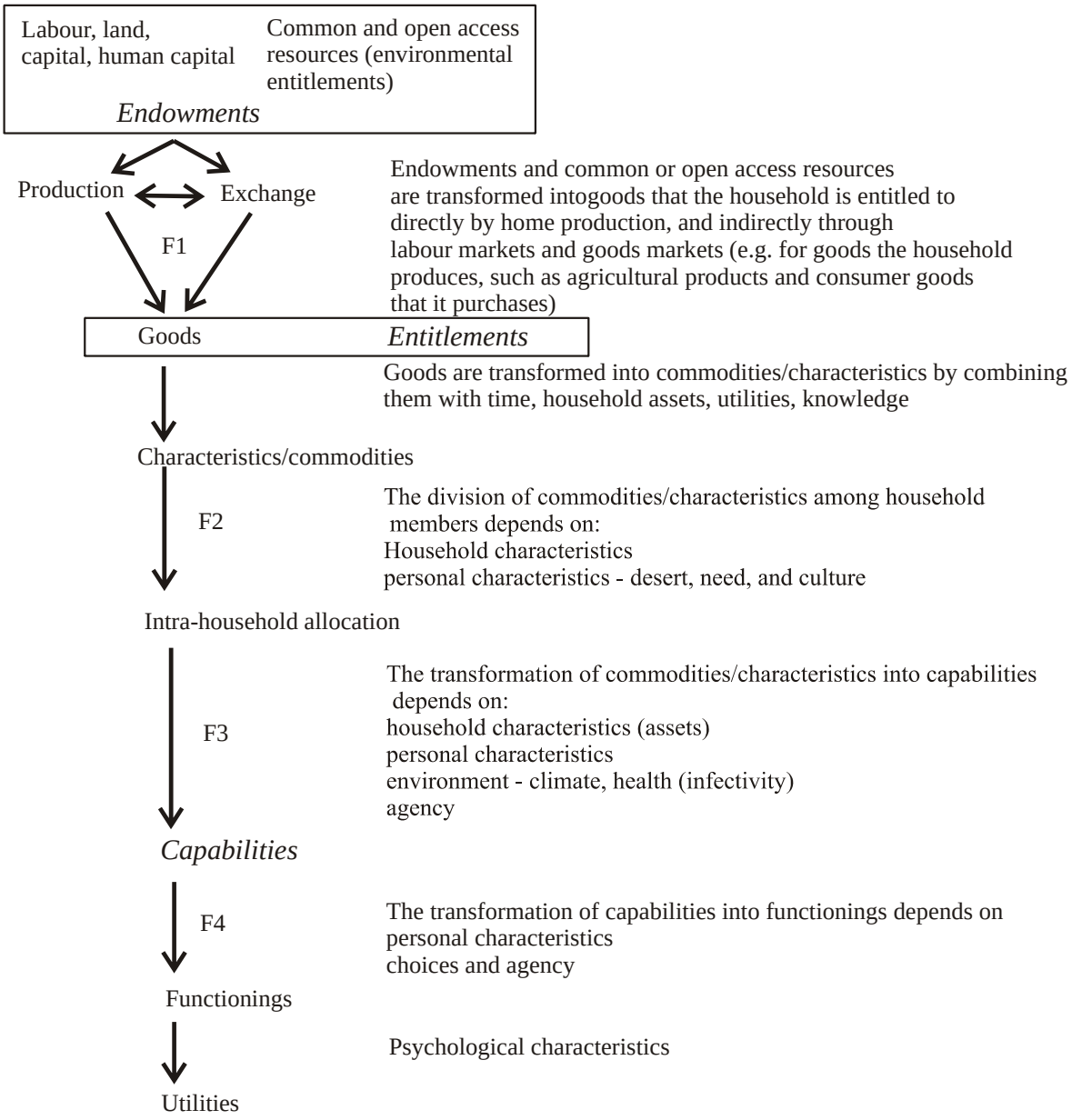


Figure 1: The Entitlements and Capabilities Framework

Note: 1. F1, F2, and F3 make up the "household technology" that transforms goods into capabilities
2. This is a particular interpretation of the entitlements and capabilities frameworks.

Appendix - 1

Figure A1 illustrates the way the shares of UV and non_UV items of households in rural and urban areas who attain the same level of well-being would be affected by the availability of "free" goods in rural areas, and how this determines the difference between our UV CPI calculations compared to Deaton's. Clearly the Rural non-food (non-UV) share is EB/(DE+EB), while the urban non-food share is (AB/(AB + OA) = (AB /(AE + EB + DE) > EB/(DE + EB).

Deaton's method amounts to multiplying the rural poverty line ((DE + EB) by the urban vs. rural CPI. Our method multiplies this by the ratio of urban to rural non-food (non-UV items) share (AB/EB). This is illustrated in Figure A2.

In Figure A2 we shift the utility curve so that E'B' = EB. Deaton's procedure multiplies OB' and B'E' by the urban vs. rural CPI giving urban PL expenditure at A'. Our procedure multiplies Deaton's urban PL by (AB/(AB + OA)) / (EB/(OA + EB)). Clearly this fraction is likely to be significantly greater than 1, so that our urban PLs will be higher than Deaton's.

It could be argued that our method provides an upper limit on the utility equivalent urban PL, while Deaton's method provides a minimum. However, this would be to neglect the difference in prices of non-UV items in the two sectors, which can be either greater or lower in urban than rural areas. However, for the major item of housing there is little doubt that the cost is higher in urban than rural areas.

Figure A1: Different Ways to Compute Urban Poverty Lines

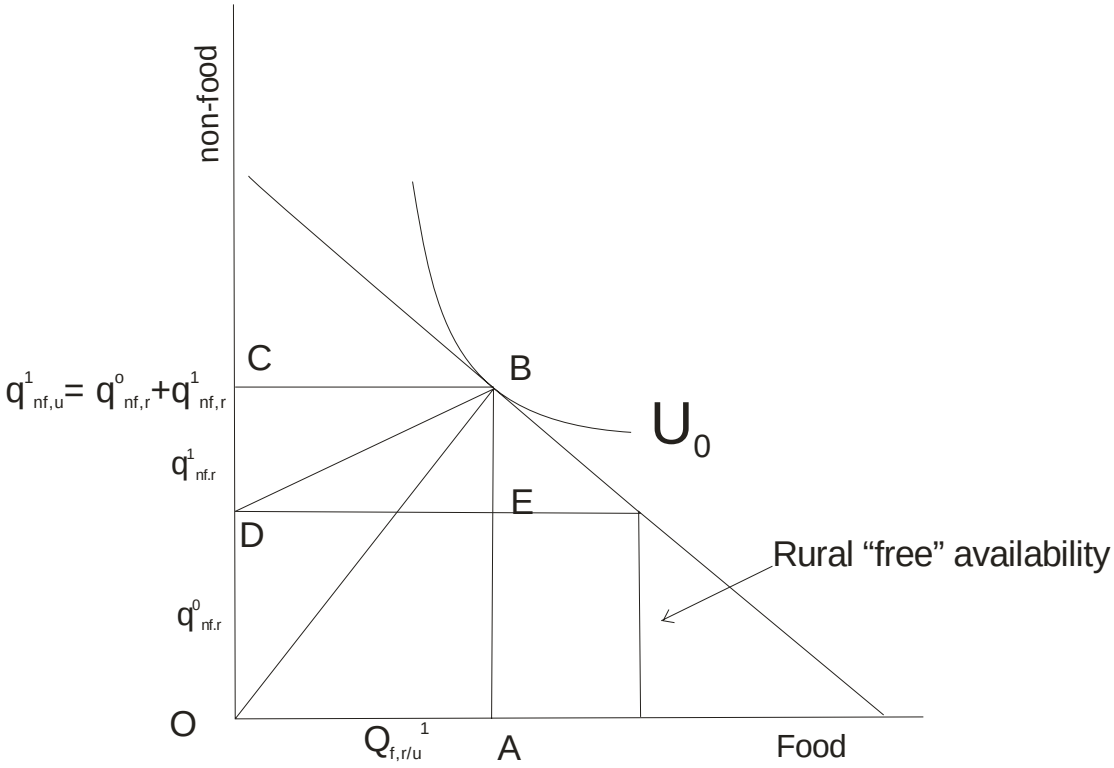
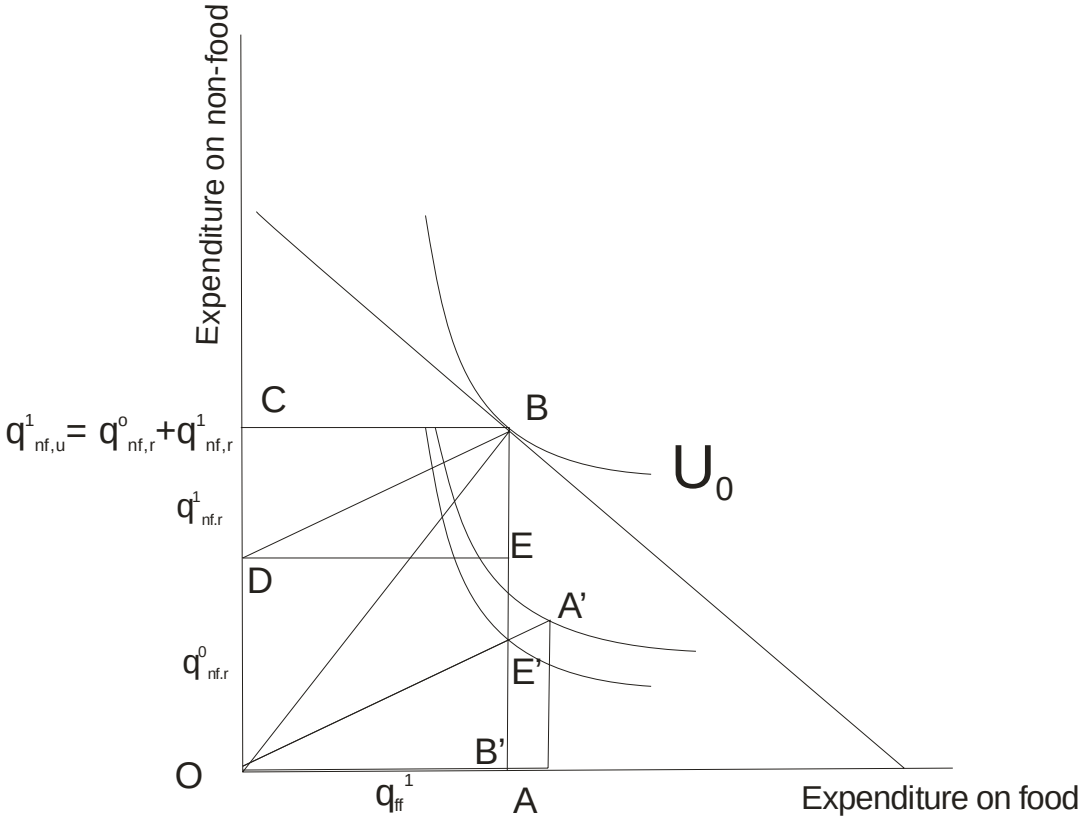


Figure A2: Procedures for Computing Urban from Rural Poverty Lines



A Simple Model of Rural and Urban Poverty Lines

Utility is comprised of two goods – food and non-food; non-food has a freely available component (q_{nf}^0) and a component that is paid for (q_{nf}^1). The prices of food and non-food are p_f and p_{nf} respectively. The consumer may be supposed to face the following expenditure (x) minimization problem:

$$\text{minimize } x = p_f q_f + p_{nf} q_{nf}^1$$
$$s.t. U(q_f, q_{nf}^1 + q_{nf}^0) \geq U_0$$

where p_f, q_j, p_{nf} and q_{nf} are the prices and quantities of food and non=food items,a nd q^1_{nf} must be purchased while q^0_{nf} is 'free". In the rural sector $q^0_{nf,r} > 0$, while in the urban sector $q^0_{nf,u}$ is 0. If tastes and prices are identical in both sectors and the poverty level utility is the same in both sectors then the above diagram illustrates the poverty line calculation. OA is the consumption of food in both sectors, and OC the consumption of non-food in both sectors. But while in the urban sector OC is entirely purchased, in the rural sector OD is provided free, say by gathering[39].

Hence the cost function to be minimised in the urban sector is

$$p_{f,u} q_{f,u} + p_{nf,u}(q^1_{nf,u})$$

and in the rural sector it is

$$p_{f,r} q_{f,r} + p_{nf}(q^1_{nf,r})$$

In the urban sector $q^0_{nf,u}$ is 0 (zero) while in the rural sector $q^0_{nf,r}$ is positive so that the cost of attaining a given level of utility in the rural sector will be significantly less than in the urban sector for the same total level of q_{nf} consumed.

Clearly the cost of attaining the poverty line minimum level of welfare will be lower in rural than in urban areas unless the prices are significantly higher in urban areas. We suggest that the higher expenditure on non-food items at most levels of (real) expenditure in urban areas can in large part be attributed to needing to pay for items that are provided free or at very low cost in rural areas. The most obvious example is housing. As pointed out above, housing expenditure is a negligible share of expenditure in rural areas, while it is significant in urban areas. Including housing alone in the UV CPIs raises the urban-rural UV CPI and the consequent difference in PLs calculated by Deaton's method by some 5% above what it is when housing is excluded (housing UV is set to zero where there is no expenditure on housing, and the usual filter that excluded items from the UV CPI calculation if either there are insufficient observations, or the UV difference is more that 100% is not applied to this item).

[39] Obviously this ignores the disutility of labour in gathering.