Prices, Inequality and Poverty: Methodology and Indian Evidence[1]

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ABSTRACT

The contribution of this paper is both methodological and empirical. It proposes a methodology for evaluating the distributional implications of price movement for inequality and poverty measurement. The methodology is based on a distinction between inequalities in nominal expenditures, where the expenditures are either measured in nominal terms or a common price deflator is applied for all households, and that in real expenditures which takes into account the varying household preferences and differences in household composition in converting the nominal to real expenditures. Changes in relative prices will cause the inflation to affect different household groups differently depending on their household size and composition and their level of relative affluence. The empirical application to the Indian budget data sets shows the usefulness of the proposed procedures. The Indian empirical evidence is of particular interest since the period chosen (1993-2005) covered both first and second generation reforms in India. The results suggest that while rural poverty rates, in both nominal and real terms, fell sharply during this period, they were accompanied by an increase in both nominal and real expenditure inequality. In contrast, the urban poverty rates were mostly static or even increased over this period. Of further interest is the result that the price movement in both areas has been inequality reducing throughout much of this period. The study also contains a decomposition analysis of the movement in inequality and poverty rates. The decomposition is done both between family types and between social groups.

Keywords: Real Expenditure Poverty, Inequality Decomposition, Scheduled Class, Equivalence Scales, Price Scaling.

JEL codes: C13, D12, D63, I32.

1. Introduction

Since expenditure pattern varies across households, primarily due to differences in their economic circumstances and in their household size and composition, differential movement in prices of items over time will have a differential impact on welfare across households. For example, inflation that is accompanied by an increase in the relative price of food vis-a- vis non-food items will affect the poorer household groups more adversely than the affluent ones. Similarly, if the prices of items that are consumed primarily by children increase more than those consumed primarily by adults, then households with large numbers of children will be hit harder than, say, childless households. Again, if the price increases are concentrated in items that exhibit substantial economies of scale, then inflation will hit the smaller households harder than the larger households simply because the former are unable to benefit from bulk purchase to the same extent as the latter. All that this means is that the aggregate inflation figure published routinely by authorities may hide substantial differences in the effective inflation rates across households. The two areas where this has immediate implications are the measurement of inequality and poverty.

With regard to inequality measurement, this point was recognised by Muellbauer (1974) over three decades back when he distinguished between real and nominal expenditure inequality and showed the divergence between the two during the 6 years, 1964-1970, of Labour rule in the UK. His principal empirical finding was that the decline in real expenditure inequality was less than that in nominal expenditure inequality thus establishing that price inflation in the UK during this period has been regressive, ie, inequality increasing. Muellbauer's contribution, that included a methodology for investigating the distributional consequences of price movements, was extended to allow more realistic and flexible demand responses to price changes and applied to UK data in Ray (1985) and, more recently, to Australian data in Nicholas, Ray and Valenzuela (2008). The study by Nicholas, Ray and Valenzuela (2008)

shares the empirical feature of Muellbauer's (1974) finding by showing that price changes in Australia in the latter half of the 1990s have favoured the rich.

The issue of the differential impact of price changes across households is also relevant in poverty comparisons. The criticism of the World Bank methodology for calculating poverty rates made by, among others, Reddy and Pogge (forthcoming), is based on the idea that, given their varying consumption pattern, the poor households face a price vector that is different from that faced by the non poor. In fact, one can extend this point to argue that the effective price index varies from one poor household to another thus questioning the use of household invariant price index in making temporal adjustment to the poverty line in comparing poverty rates over time. The issue gets more complex in international poverty comparisons since the exchange rates used in converting an internationally specified poverty lines denominated in , say, the US dollar into the national currencies must be converted using exchange rates that are more relevant for the poor. The idea here is the same-due to differences in the households' spending power and in their size and composition, the price index used in deflating the nominal expenditures in comparing poverty over time will vary not only between households below and above the poverty lines but also between households at varying levels of poverty. This aspect is rarely acted upon by government agencies in devising and revising poverty lines in response to price movements.

A logical implication of the above discussion is that ,based on the same vector of item prices, each household will face a different overall effective price index depending on its expenditure allocation over the various consumption categories. Since this effective price index will vary across households, this will cause a divergence between nominal and real expenditure inequalities, and between official and "real" poverty rates. We define nominal expenditure inequality as that which calculates inequality in per capita or per adult equivalent money expenditures, and real inequality as the measure of inequality where we deflate the

money expenditures by the household specific price indices. In case of poverty comparisons, the corresponding distinction is between poverty rates based on poverty lines used in official poverty calculations and poverty rates based on this idea of household specific inflation adjustments to their nominal expenditures. Much of the recent debate over poverty lines in India[4] has been between the advocates of the "direct method", where the poverty line is specified in terms of the minimal calorie needs, and advocates of the more conventional "indirect method" based on expenditures and an expenditure based poverty line that was originally derived from a calorie norm but then periodically revised using official price indices. The present exercise abstracts from that debate and compares the official "indirect" method with another "indirect method" that questions the use of the official price index in updating the poverty lines in the same manner for all households and that too using a weighting scheme to aggregate the item wise prices into an overall price index using a non representative consumption basket for the poor.

The principal motivation of this paper is to provide a unified methodology for incorporating the differential effect of price movements in the welfare comparisons involved in inequality and poverty calculations and apply it to Indian data. In particular, the paper proposes a methodology for assessing whether relative price movements in India have been inequality increasing or decreasing. This paper also provides new and improved estimates of equivalence scales, proposes a test of the variation of the equivalence scales with relative prices, and provides evidence of consumer's expenditure responses to price and aggregate expenditure changes, all of which are required in studies that involve welfare comparisons between households. The period considered, 1993/94 - 2004 , is particularly significant for it covers the period of what is commonly referred to as first and generation economic reforms

[4] See, for example, Lancaster and Ray (2005), Ray (2007), and Sen (2005).

in India. This paper provides evidence on inequality and poverty movements in India over this period, looks at the role played by the price changes in these movements, decomposes the inequality and the poverty estimates by household groups defined by household composition and by the social classification of the household.

The plan of the rest of the paper is as follows. Section 2 introduces the price dependent equivalence scale specification and the corresponding demographically extended quadratic "almost ideal" demand system (PS-QAIDS). Section 3 derives the expression for real expenditure that is used to calculate "real expenditure inequality" and "real expenditure poverty". Section 4 describes briefly the data sets and presents the demographic demand parameter estimates. The inequality and poverty estimates are presented and analysed in Sections 5 and 6 respectively. Section 7 concludes the paper.

2. Equivalence Scale Specification and Demographic Demand System

The Price Scaling (PS) demographic technique, introduced in Ray (1983), stems from the definition of the general equivalence scale, m_{oh} , as the ratio of costs of obtaining a reference utility level, u, at a given vector of prices, p, of a household h with z children and a reference household, R.

$$c_h(u,p,z) = m_{oh}(z,p,u)c_R(u,p) \qquad (1)$$

If one specifies a suitable functional form for the cost function of the reference household, $c_R(u,p)$, which satisfies the usual economic theoretic conditions of linear homogeneity in prices, symmetry and concavity, then the choice of a suitable functional form for $m_{oh}(z,p,u)$[5] gives us the corresponding form for the cost function of household h. The latter

[5] $m_{oh}(z,p,u)$ must be homogenous of degree 0 in prices for $c_h(u,p,z)$ to be homogenous of degree 1 in prices.

yields, on application of Shephard's Lemma, the price scaled demographic demand equations.

Pollak and Wales (1979) were the first to point out that equivalence scales cannot be estimated from demand data. Blackorby and Donaldson (1993) have however shown that the assumption of utility independence allows the scale to be identified from budget data that are pooled across different time periods containing price variation[6].

We choose the following functional forms for the utility invariant general equivalence scale, $m_{oh}(z,p)$, and for the cost function of the reference household, $c_h(u,p)$,

$$m_{oh}(z,p) = \prod_k p_k^{\delta_k z_h} \prod_k p_k^{\varphi_k n a_h} (n a_h + \rho z_h) \qquad (2)$$

Where $\sum_k \delta_k = 0$.

$$lnc_R\,(p,u) = ln\, a(p) + \frac{ub(p)}{1-uc(p)} \qquad (3)$$

where na_h denotes the number of adults in household h, z_h denotes the corresponding number of children, ρ is the equivalence scale. φ_k , δ_k denote the price sensitivity of the equivalence scale interacting with the number of adults, number of children, respectively. ρ can be interpreted as the "cost" of a child in the base year (when p=1) relative to an adult whose scale is normalised at 1.

The expenditure function (3) of the reference household, *R*, which was introduced by Banks, Blundell and Lewbel (1997), generalises the PIGLOG cost function by allowing *c(p)* to vary with prices. The choice of the following functional forms for *a(p)*, *b(p)*, *c(p)*[7] yields the

[6] See also Pendakur (2002).

[7] While *a(p)* is homogenous of degree 1 in prices, *b(p)* and *c(p)* are homogenous of degree 0 in *p*.

Quadratic Almost Ideal Demand System (QUAIDS) which is a rank 3 generalisation of the 'almost ideal' demand model.

$$lna(p) = \alpha_0 + \sum_k \alpha_k \, lnp_k + \frac{1}{2}\sum_i \sum_j \gamma_{ij} lnp_i lnp_j \qquad (4a)$$

$$b(p) = \prod_k p_k^{\beta_k} \qquad (4b)$$

$$c(p) = \sum_k \lambda_k \, ln \, p_k \qquad (4c)$$

$$\sum_k \alpha_k = 1, \ \sum_k \beta_k = \sum_i \gamma_{ij} = \sum_k \lambda_k = \sum_k \delta_k = \sum_k \varphi_k = 0, \ \gamma_{ij} = \gamma_{ji}$$

Equations (1)-(3) yield, on application of Shephard's Lemma, the following demographic demand system, PS-QUAIDS, in budget share terms,w_i.

$$\begin{aligned} w_{ih} = {} & \alpha_i + \delta_i z_h + \sum_j \gamma_{ij} \, lnp_j \\ & + \beta_i \Big[lnx_h - \alpha_0 - \sum_k \alpha_k \, lnp_k - \frac{1}{2}\sum_i \sum_j \gamma_{ij} lnp_i \, lnp_j - \ln(na_h + \rho z_h) \\ & - \sum_k \varphi_k \, na_h lnp_k - \sum_k \delta_k \, z_h lnp_k \Big] + \lambda_i \Big[\prod_k p_k^{-\beta_k} [lnx_h - \alpha_0 \\ & - \sum_k \alpha_k \, lnp_k - \frac{1}{2}\sum_i \sum_j \gamma_{ij} lnp_i \, lnp_j - \ln(na_h + \rho z_h) - \sum_k \varphi_k \, na_h lnp_k \\ & - \sum_k \delta_k \, z_h lnp_k]^2 \end{aligned} \qquad (5)$$

where x_h denotes the nominal expenditure of household h. In the estimations that are reported below, we set α_o a priori at zero. The λ_i s. measure the quadratic expenditure

effects and if they are all 0, then eqn.(5) specialises to the conventional Almost Ideal Demand System.

3. Nominal and Real Expenditure Inequality and Poverty

A comparison of the nominal and real expenditure inequalities will throw light on the inequality implications of price movements. Let us recall the cost or expenditure function of household *h* in period *t*.

$$lnc_{ht}(u,p,z) \equiv lnx_{ht} = lnm_{0h}(z_h,p_t) + lna(p_t) + \frac{u_t b(p_t)}{1-u_t c(p_t)} \tag{6}$$

where x_{ht} is the nominal expenditure of the household and u_t is the utility measure in year *t*. Following Muellbauer (1974, pg 42), we define real expenditure of household *h* in year t, namely,$\check{x}_{ht}$ as the minimum expenditure needed to obtain current year utility, u_t at base year price, p_0. In other words:

$$\check{x}_{ht} = c(p_0,u_t,z_h) \tag{7}$$

The application of (7) in (6) yields, after some rearrangement, the following expression for real expenditure:

$$\check{x}_{ht} = \bar{m}_{oh}(z_h)\prod\nolimits_k p_{kt}^{\delta_k z_h}\prod\nolimits_k p_{kt}^{\phi\delta_k na_h}\, a_0$$

$$exp\left[\frac{b_0}{\left(c_t + \frac{b_t}{lnx_t - lna_t - ln\bar{m}_o - \sum_k \varphi_k na_h\, lnp_{kt} - \sum_k \delta_k z_h lnp_{kt}} - c_0\right)}\right] \tag{8}$$

where $\bar{m}_{0h} = (na_h + \rho z_h)$ is the base year equivalence scale, and a_t, b_t, c_t are given in (4a)-(4c) above. It is readily verified from (8) that in the base year the real and nominal

expenditures are equal (i.e. $\check{x}_{ho} = x_{h0}$) and, consequently, the nominal and real expenditure inequalities will coincide. The magnitude and sign of the difference between the inequalities in real and nominal expenditures per adult equivalent, i.e. between the inequalities in $\check{y}_{ht}(= {}^{\check{x}_{ht}}/_{\bar{m}_{0h}})$ and $y_{ht}(= {}^{x_{ht}}/_{\bar{m}_{0h}})$ will, therefore, depend not only on the price vector in the given year but also on the estimated demand parameters that will determine the a_t, b_t and $c_t$values.

Note also, that the sign and magnitude of the difference between the real and nominal expenditure inequalities will depend, quite crucially, on the movement in relative prices. In the case of no change in relative prices between current year *t* and base year, 0, the two inequalities will coincide. To see this, suppose all prices increase by the same proportion, i.e., $p_t = kp_0$.

From (8),

$$ln\check{x}_{ht} = ln\bar{m}_{0h} + \sum_k \delta_k z_h lnp_{kt} + lna_0 + \left[\frac{b_0}{\left(c_t + \frac{b_t}{lnx_t - lna_t - ln\bar{m}_0 - \sum_k \phi_k na_h \ lnp_{kt} - \sum_k \delta_k z_h \ lnp_{kt}} - c_0\right)}\right] \quad (9)$$

By linear homogeneity in prices, *p*, of a_t and zero degree homogeneity in p of $b_{t,}c_t$ and $\sum_k \delta_k z_h lnp_{kt}$, it follows:

$$ln\check{x}_{ht}$$

$$= ln\bar{m}_{0h}$$

$$+ \sum_{k} \delta_k z_h ln p_{kt} + ln a_0 + \left[\frac{b_0}{\left(\frac{b_0}{ln x_{th} - ln a_0 - ln\bar{m}_{0h} - \sum_k \delta_k z_h ln p_{0t} - \sum_k \phi_k na_h \ln p_{0t} - ln k} \right)} \right]$$

$$= \ln\left({}^{x_{ht}}/_{k}\right) \quad (10)$$

Since *k* is not indexed on *h*, it follows from the requirement that an expenditure inequality index must be homogenous of degree zero in expenditure that the real and nominal expenditure inequalities will coincide in the base year.

Besides the Gini inequality index, we have used the Generalised Entropy inequality index, GE(α)[8]. The parameter, α, can be interpreted as a measure of equality-aversion. As α decreases, the index becomes more sensitive to transfers at the lower end of the distribution, and less weight is attached to transfers at the top; when α =2, the index attaches the same weight to transfers at all expenditure levels. The GE (α) family of inequality indices includes as special cases GE (1) and GE (2) which have been proposed by Theil (1967). In the empirical application below, we have used the GE (0), GE (1) and GE (2) inequality measures. The GE measure of inequality has the attractive feature that it can be decomposed into between group and within group inequality. Shorrocks (1980) has derived the entire class of measures that are decomposable under relatively weak restrictions on the form of the index.

The real and nominal inequality indices, which are defined over real (y_{ht}) and nominal (y_{ht}) expenditure per adult equivalent are given by I_t^R and I_t^N, respectively.$(I_t^R - I_t^N) > 0$ implies

[8] See Sen (1997) for the expression of the GE(α) inequality index and an analysis of its decomposability properties.

that the relative price movement has been in egalitarian or inequality increasing, while the reverse is indicated if $(I_t^R - I_t^N) < 0$.

Analogous to the definitions of nominal and real expenditure inequalities, we can define the nominal and real poverty rates as those that omit and include, respectively, the distributional impact of price movements. The nominal poverty rates, P_t^N, are those that assume that all households face the same price vector and consequently are based on the official poverty line and, its periodic revision in line with inflation, as published for the various rounds by the Govt. of India and used in the official poverty rate calculations. In contrast, the concept of real poverty rate, P_t^R, that is proposed here bases the poverty rate calculations not on the revision of the poverty line but on the revision of the total expenditure per equivalent adult so as to compensate for the inflation and the change in relative prices, taking into account the household preferences and substitution between items by the households in response to changes in the relative prices. In other words, while the nominal poverty rates, P_t^N are the poverty rates calculated using the nominal expenditures per adult equivalent (y_{ht}) and the official poverty lines, the real poverty rates are based on the real expenditures per adult equivalent, (y_{ht}), and the poverty line in the initial year, ie. NSS round 50 in this study. As with the inequality rates, the nominal and real poverty rates will coincide in the base year (NSS round 50), but will diverge in the comparison years (NSS rounds 55 and 61). $(P_t^R - P_t^N) > 0$ implies that the official revision of the poverty line leads to a downward bias in the poverty rates ,while the reverse is indicated if $(P_t^R - P_t^N) < 0$. The bias in the nominal poverty rates (P_t^N) in relation to the real expenditure poverty rates (P_t^R) that is proposed here is due to the combination of the use in calculating the former of an household invariant temporal adjustment to the household expenditures to compensate for price movements and the use in the latter of the official poverty lines which may not reflect the true nature of price inflation faced by the individual households.

Keeping in mind the need to decompose the poverty estimates between various demographic groups and, alternatively, between various socio economic classes, we used the decomposable measure of poverty[9] due to Foster, Greer and Thorbecke (1984), P_α. When α takes on the value 0, the measure becomes the head-count ratio. All the indices in the P_α class, with the exception of P_0 (which is the head count ratio), satisfy the monotonicity axiom. At α=1, the index becomes P_1=HI, the per capita poverty gap. In this study, we have used the P_0, P_1 and P_2 members of this class of FGT poverty measures.

4. Data Sets and Demographic Demand Estimates.

This study uses the detailed information on expenditure on various items, on household size, composition and the socio economic class of the household contained in the unit records from the 50th (July, 1993-June, 1994), 55th (July, 1999-June, 2000) and 61st (July, 2004-June, 2005) rounds of India's National Sample Surveys. All these rounds are "thick" rounds being based on large samples and are comparable. These three surveys cover a reasonably long time interval (1993-2004) to make the comparisons of poverty and inequality meaningful and significant since it covers the period of economic reforms in India. The price information was obtained from published price series put out by the Government of India and the RBI. The State specific poverty lines are made available by the Planning Commission[10].

While the demand estimation was carried out, separately for the rural and urban areas, by pooling the data from all the states, the analysis of inequality and poverty was performed separately for the major states of India. The demand systems were estimated on the following 4 item breakdown of household expenditure: Food (i=1), Fuel and Light (i=2), Clothing, Bedding and Footwear (i=3), and Miscellaneous (i=4).While the Consumer Price Index for

[9] See Sen(1997) for a lucid discussion of decomposable property and other useful features of this poverty measure.

[10] Further details are available on request.

Agricultural Labourers (CPIAL) for these major commodity groupings was used as rural prices, the Consumer Price Index for Industrial Workers (CPIIW) was used as the urban prices. Table 1 reports the price series for the 4 items as used in the demand estimation. Fuel and Light and the composite item, called Miscellaneous, recorded the largest price increase over this period. There was a significant realignment of prices leading to changes in relative prices in both rural and urban areas. This is a significant observation in the current context since changes in relative prices motivate this study by opening up the possibility of divergence between nominal and real inequality (and poverty).

Insert Table 1 here

The demographic demand parameter estimates are presented in Table 2 (rural) and Table 3 (urban).The estimates are mostly well determined and highly significant. The estimates of λ_i , that are mostly highly significant, confirm the presence of rank three demand, i.e. quadratic effects of household expenditure on budget shares, and point to non linear Engel curves. The estimated price parameters, the γ_{ij} s, confirm the presence of significant price sensitivity of the expenditure allocation over the chosen period. The significant estimates of φ_i and δ_i show that the equivalence scales vary with the structure of relative prices, and this is true in both rural and urban areas. There are some rural urban differences in the parameter estimates, especially in the nature of the quadratic expenditure effects on budget share as measured by the estimated λ_is.The equivalence scale is well determined in both areas confirming that the proposed demographic demand system is capable of yielding sensible and precise estimates of the household size deflator. On either data set, a child costs around 30 % of an adult in the base year (1993-1994).

Insert Table 2 and Table 3 here

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5. Prices and Expenditure Inequality.

Tables 4 and 5 present the expenditure shares in rural and urban areas, respectively, of households in the five quintiles of the expenditure distribution, arranged in an ascending order of household expenditure per adult equivalent. The tables report the shares of the quintiles in terms of both nominal expenditure per adult equivalent (y_h) and real expenditure per adult equivalent (y_h).There has been expenditure redistribution in both rural and urban areas from the bottom three quintiles to the top quintile throughout the reforms period and beyond (1993/94-2004/2005).The expenditure distribution in both nominal and real terms is more unequal in the urban areas compared to the rural as reflected in the lower share of the bottom three quintiles in the urban sector. A comparison of the nominal and real expenditure shares suggests that the price movements have been progressive over this period since the real expenditure shares of the lower quintiles exceed the corresponding nominal expenditure shares in NSS rounds 55 and 61[11], and this is true in rural and urban areas. This is not surprising if we recall that during this period the price of the composite item called Miscellaneous that figures more prominently in the expenditures of the more affluent households increased more than those of the other items.

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[11] Since the prices are normalised at unity in the base round 50, the nominal and real expenditure shares are the same in that round. This remark also holds for inequality and poverty rates.

Insert Table 4 and Table 5 here

The progressive nature of the price movements in India during the 1990s and the early part of the new millennium is seen more directly from Tables 6 and 7 which present the nominal and real expenditure inequalities in the two sectors[12]. The nominal expenditure inequalities exceed their real counterpart in both the comparison rounds 55 and 61.These tables confirm the increase in expenditure inequality that Tables 4 and 5 had led us to expect. While the expenditure inequality has been increasing in both rural and urban areas throughout our chosen period, the increase has been particularly large in both areas in the second half, namely, 1999/2000 to 2004/2005.The urban expenditure distribution is more unequal than the rural in both nominal and real terms. The tables present evidence on the robustness of the qualitative picture on inequality by reporting the inequality calculations using the conventional Gini measure and the additively decomposable inequality measure, the Generalised Entropy, GE(α). Note that the parameter α in the GE class represents the weight given to distances between expenditures at different parts of the expenditure distribution. For lower values, the GE measure is more sensitive to changes in the lower tail of the distribution and for higher values GE is more sensitive to changes that affect the upper tail. A point of interest is that the progressive nature of the price movements is more evident in case of the GE (2) measure than in case of the Gini, GE(0) and GE(1). This suggests that the progressive nature of the price movements affects the households in the upper tail much more than those in the lower tail.

[12] The nominal and real expenditure inequality estimates of the major states in NSS rounds 50, 55 and 61 are presented in the Appendix Tables A1-A6 for the rural areas and Appendix tables A7-A12 for the urban areas. These show that the inequality reducing nature of price movements was true in all the states, more in some states and less in others, as also the increase in inequality over this period.

Insert Table 6 and Table 7 here

Further evidence on the impact of price movements on expenditure inequality is presented in Tables 8 and 9 which report in case of NSS round 61[13] the decomposition of the nominal and real expenditure inequalities between different household types in the rural and urban areas respectively using the decomposable GE (α) measure of inequality. In both sectors, the reduction in expenditure inequality as we move from nominal to real expenditures is entirely due to the within group component of inequality, with the between group component remaining the same in both nominal and real terms. Tables 10 and 11 present the corresponding decomposition in terms of social groups .The picture is very similar with the price movements affecting the expenditure inequality only through the within group component of inequality. This result in intuitively plausible since the distributive effects of price movements rest not only on changes in relative prices between the base year and the comparison year but also on differences in consumer preferences between households .Such differences are more likely to prevail between groups than within groups.

Insert Table 8, Table 9, Table 10 and Table 11 here

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[13] The corresponding figures for NSS rounds 50 and 55 are not presented here for space reasons but are available on request.

The above discussion has assumed the absence of economies of household size. In order to examine the role played by the economies of household size, we allow size economies by generalising the equivalence scale specification [eq. (2)] via the introduction of the parameter, θ, as follows:

$$m_{oh}(z,p) = \prod_k p_k^{\delta_k z_h} \prod_k {p_k}^{\phi_k \, na_h} \, (na_h + \rho z_h)^{\theta} \qquad (11)$$

θ=1 assumes the absence of economies of household size. This is the case with the calculations reported above. As θ declines from 1 , the household experiences economies of scale that increase as θ declines further towards 0, while as θ increases beyond 1, the household experiences diseconomies of scale. The sensitivity of the inequality estimates to the presence of household size economies was examined by repeating the calculations over a range of θ values. The precise nature of the relationship between inequality and θ has been a matter of some controversy [see Coulter et. al. (1992), Banks and Johnson (1994)]. Figures 1 and 2 provide evidence from India's rural and urban areas , respectively, on this issue by plotting the graphs of nominal and real expenditure inequalities against a range of θ values varying from θ=0 to θ=1.2[14] based on the 61st round of the National Sample Survey. The gap between the two graphs is a measure of the bias in the nominal inequalities in relation to the real expenditure inequalities. These figures confirm what we saw earlier, namely, that in both areas of the Indian economy, the price movement across items has been progressive resulting in a reduction of real expenditure inequality from nominal inequality during the 61st round. The figures show that this result is robust to a wide range of θ values. A comparison of Figures 1 and 2 shows that the bias has been much less in the urban areas than in the rural

[14] θ=0 implies that household expenditures are uncorrected for differences in household size and composition, 0<θ<1 implies consumption economies of scale that favour larger sized households, while θ>1 implies diseconomies that favour smaller sized households.

.The graphs also establish a mild U shaped relationship between inequality and economies of household size.

Insert Figure 1 and Figure 2 here

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6. Prices and Expenditure Poverty

Tables 12 – 14 present the two sets of head count rural poverty rates in the major states of India during the three NSS rounds that have been considered in this study, while Tables 15-17 present the corresponding urban poverty rates[15]. These tables allow a comparison not only between the nominal and real poverty rates that throw light on the bias due to the movement in relative prices on poverty calculations but also provide evidence on the impact of allowing adult child relativities on the poverty rates. The rural/ urban difference in the movement of the per capita nominal poverty rates computed from the expenditures for all the items is striking. A decline in the rural nominal poverty rates from 0.26 in 1993/94 to 0.18 in 2003/4 contrasts sharply with an increase in the corresponding urban poverty rates from 0.19 to 0.27. Much of the latter increase took place during the second half, i.e. during the period, 1999/2000 to 2003/2004. Of more direct interest in this study, that a comparison of the nominal and real poverty rates based on the expenditures on the four included items establishes, is the result that the nominal poverty rates that are based on the official poverty lines had an upward bias in relation to the real poverty rates[16]. This parallels the earlier result

[15] The poverty line for the expenditure calculations based on the 4 included items were obtained by multiplying the official poverty lines by the median Engel ratios of the 4 included items to total expenditure.

[16] This is explained by the higher price increases in the "Miscellaneous" category compared to the other items along with the fact that the budget share of this composite item has also increased significantly over this period. The nominal expenditure poverty rates that are based on the official poverty lines do not take into account these changes in the expenditure pattern and the relative prices unlike the real expenditure poverty rates that do.

that the price movements had a progressive, inequality reducing effect through the realignment of relative prices. Other noticeable features from these tables include the feature that while the rural expenditure poverty rates for the expenditures on the included items fell sharply, the corresponding urban poverty rates were largely unchanged.

Insert Table 12, Table 13, Table 14, Table 15, Table 16 and Table 17 here

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Figure 3 and 4 present evidence on the impact of economies of scale of household size on the poverty calculations[17] in the rural areas and urban areas, respectively, by plotting the graphs of the nominal and real poverty rates against a range of θ values in case of NSS round 61. Once again, there is a similarity with the inequality results. The real poverty rates are lower than the nominal poverty rates and the gap between the two increases as the size economies decrease. In case of the assumed value of θ .being 0.6 or less, the two poverty rates are virtually identical, and this is true of both rural and urban areas. In other words, the official poverty line based poverty rates provide a reasonably accurate picture of real expenditure poverty only if there exists significant economies of household size in consumption. The graphs agree that there is a positive relationship between the calculated poverty rates and the assumed value of the size economies parameter, θ, used in the poverty calculations- in other words, the larger the size economies, the lower the estimated poverty rate. This is explained

[17] See Meenakshi and Ray (2000) for previous evidence from India, Lanjouw and Ravallion (1995) for evidence from Pakistan and Lancaster, Ray and Valenzuela (1999) for cross country evidence from a range of developing and developed countries on the sensitivity of the poverty estimates to household size economies in consumption.

by the fact that in the NSS data sets the larger sized households, that can take advantage of economies of household size, dominate the samples[18].

Insert Figure 3 and Figure 4 here

Tables 18 and 19 present the poverty shares of the various social groups and compare them to the shares of these groups in the samples in the rural and urban areas, respectively, in NSS round 61 using the additively decomposable FGT poverty measure, P_α mentioned before. These shares were calculated from the poverty estimates[19] corresponding to 3 values of the "equality aversion" parameter, α. Note that, of these, the FGT measure at α=0 is the traditional head count poverty rate. Consistent with the evidence of Meenakshi and Ray (2002) for rural India, Table 18 shows that the scheduled tribes (ST) and scheduled castes (SC) are more vulnerable to poverty than the other social groups in the rural areas. This is evident from the fact that the SC/ST households endure much higher poverty shares than their population shares, if we assume that the NSS samples are representative of the population. There is however an interesting rural/urban difference in this picture. The ST households don't do as badly in the urban areas with their poverty share not out of line with their population share. In contrast, the "other backward classes", as a social group, fare much worse in the urban areas enduring higher poverty shares than their shares of the population, in relation to a similar comparison in the rural areas where they fare much better. In both areas

[18] Typically, two thirds or more of the households have two or more adults and 1 or more children.

[19] The poverty rate estimates at both All India and State levels for the various social groups are not presented here for space reasons but are available on request.

of the Indian economy, the social group which falls outside the SC/ST/OBCs have fared much better on poverty as established from a comparison of their poverty and population shares.

Insert Table 18 and 19 here

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7. Conclusion

The contribution of this paper is both methodological and empirical. It proposes a methodology for evaluating the distributional implications of price movement for inequality and poverty measurement. Changes in relative prices will cause the inflation to affect different household groups differently depending on their household size and composition and their level of relative affluence. For example, inflation that is accompanied by an increase in the relative price of food vis-a-vis non food will affect the poorer household groups more adversely than the affluent ones. The methodology is based on a distinction between inequalities in nominal expenditures, where the expenditures are either measured in nominal terms or a common price deflator is applied for all households, and that in real expenditures which takes into account the varying household preferences and differences in household composition in converting the nominal to real expenditures. Inflationary price movements that are accompanied by changes in relative prices open up a divergence between inequalities in nominal expenditures, which uses a common price deflator, and that in real expenditures. The logic of this argument can be easily extended to poverty measurement to argue that nominal poverty rates that are based on periodic revision of the poverty line using a common

inflation rate across households will differ from real poverty rates which are based on the real expenditures which adjust each household's nominal expenditure for price increases by taking into account its preferences, demographics and the movement in relative prices.

The empirical application to the Indian budget data sets shows the usefulness of the proposed procedures. The Indian empirical evidence is of particular interest since the period chosen (1993-2005) covered both first and second generation reforms in India. Much of world attention has been focussed on India over this period due to the wide ranging nature of the economic reforms and consequently a study of their impact on household welfare is of particular significance. The results suggest that while rural poverty rates, in both nominal and real terms, fell sharply during this period, it was accompanied by an increase in both nominal and real expenditure inequality. The poverty statistics in urban India are less encouraging since they show little or no decline in the urban poverty rates. Of further interest is the result that the price movement has been inequality reducing throughout much of this period. In the poverty context, our calculations suggest that the nominal poverty rates which are based on the official poverty lines and the assumption of a household invariant price adjustment for the inflation had an upward bias in relation to the real expenditure poverty rates.

The study also contains a decomposition analysis of the movement in inequality and poverty rates. The decomposition is done both between family types and between social groups. It finds that the between group components of inequality and poverty dominate that within groups and, moreover, the consequences of relative price changes are registered more for the between group than the within group component. Consistent with existing evidence, the scheduled tribe and scheduled caste households bear a disproportionately larger share of poverty though this is true more for the rural areas than in the urban.

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Tables

Table 1: Prices Indices for Rural and Urban Samples with 50th Round as Base-Period

Commodity Group	Rural			Urban		
	50th	55th	61st	50th	55th	61st
Food Group	1.000	1.414	1.508	1.000	1.655	1.869
Fuel & Light Group	1.000	1.485	1.912	1.000	1.689	2.609
Clothing, Bedding & Footwear	1.000	1.366	1.628	1.000	1.536	1.732
Miscellaneous Group	1.000	1.551	1.832	1.000	1.684	2.111

Notes:

a. CPI for Agricultural Labourers and CPI for Industrial Workers are taken for rural and urban samples respectively.
b. The survey period for 50th, 55th and 61st rounds is 1993 July to 1994 June, 1999 July to 2000 June and 2004 July to 2005 June respectively.
c. For 50th round rural sample, price indices are calculated as weighted average of state level price indices (21 Major states) for September 1994 as the representative month for the prices prevailing during 50th round survey period. Population share of each state in the total rural sample population is used as weight.
d. For 50th round urban sample, the average of price indices for the financial year (April to March) is taken as the representative figure for the prices prevailing during 50th round survey period.
e. For both the samples 50th round is taken as a base period (1993/94 =1.000) and the price indices for 55th round and 61st round is calculated as a change over the base-period prices.

Table 2: PS-QUAIDS Parameter Estimates (Rural) for 4 Commodity Groups[a]

Parameter	Estimates[b]	Parameter	Estimates[b]	Parameter	Estimates[b]	Parameter	Estimates[b]
α1	-0.984	δ1	0.000	ρ	0.303	γ33	-2.309
	(0.000)		(0.506)		(0.000)		(0.000)
α2	0.373	δ2	-0.004	γ11	-3.044	γ43	-3.897
	(0.000)		(0.000)		(0.000)		(0.000)
α3	0.075	δ3	0.000	γ21	-3.435	γ44	-3.707
	(0.000)		(0.000)		(0.000)		(0.000)
α4	1.535	δ4	0.004	γ31	2.453	λ1	-0.059
	(0.000)		(0.000)		(0.000)		(0.000)
β1	0.650	φ1	-0.004	γ41	4.027	λ2	0.002
	(0.000)		(0.000)		(0.000)		(0.000)
β2	-0.058	φ2	-0.007	γ22	-3.896	λ3	-0.001
	(0.000)		(0.000)		(0.000)		(0.032)
β3	0.008	φ3	0.002	γ32	3.753	λ4	0.057
	(0.000)		(0.000)		(0.000)		(0.056)
β4	-0.600	φ4	0.009	γ42	3.578		
	(0.000)		(0.981)		(0.000)		

a. These correspond to the 4 item (as shown in Table 1) breakdown of household expenditure.

b. The figures in brackets denote p-values.

Table 3: PS-QUAIDS Parameter Estimates (Urban) for 4 Commodity Groups[a]

Parameter	Estimates[b]	Parameter	Estimates[b]	Parameter	Estimates[b]	Parameter	Estimates[b]
α1	-0.810	δ1	0.004	ρ	0.299	γ33	0.007
	(0.000)		(0.506)		(0.000)		(0.994)
α2	0.164	δ2	-0.004	γ11	-0.966	γ43	-2.056
	(0.000)		(0.000)		(0.180)		(0.016)
α3	0.388	δ3	-0.003	γ21	-1.546	γ44	-1.378
	(0.000)		(0.000)		(0.069)		(0.082)
α4	1.257	δ4	0.003	γ31	0.643	λ1	-0.054
	(0.000)		(0.000)		(0.431)		(0.000)
β1	0.582	φ1	-0.006	γ41	1.868	λ2	-0.003
	(0.000)		(0.000)		(0.013)		(0.000)
β2	0.014	φ2	-0.005	γ22	-1.426	λ3	0.006
	(0.000)		(0.000)		(0.156)		(0.000)
β3	-0.079	φ3	-0.001	γ32	1.406	λ4	0.051
	(0.000)		(0.000)		(0.145)		(0.000)
β4	-0.516	φ4	0.013	γ42	1.566		
	(0.000)		(0.986)		(0.079)		

a. These correspond to the 4 item (as shown in Table 1) breakdown of household expenditure.

b. The figures in brackets denote p-values.

Table 4: Quintile Shares of Total Expenditure in Rural Areas

	Nominal Expenditure Share			Real Expenditure Share		
Quintile	50th	55th	61st	50th	55th	61st
1	10.237	9.746	9.188	10.237	9.813	9.374
2	14.344	13.858	13.145	14.344	13.945	13.377
3	17.837	17.495	16.785	17.837	17.582	16.955
4	22.443	22.415	21.820	22.443	22.479	21.925
5	35.139	36.485	39.062	35.139	36.182	38.368

Table 5: Quintile Shares of Total Expenditure in Urban Areas

	Nominal Expenditure Share			**Real Expenditure Share**		
Quintile	50th	55th	61st	50th	55th	61st
1	9.039	8.477	7.792	9.039	8.580	7.854
2	13.399	12.940	11.593	13.399	13.065	11.679
3	17.250	16.945	15.874	17.250	17.064	15.968
4	22.621	22.657	22.446	22.621	22.735	22.558
5	37.691	38.981	42.295	37.691	38.556	41.941

Table 6: Nominal and Real expenditure Inequalities in Rural Areas

Rounds	**Nominal**				**Real**			
	Gini	Generalized Entropy			Gini	Generalized Entropy		
		GE(0)	GE(1)	GE(2)		GE(0)	GE(1)	GE(2)
50th	0.248	0.101	0.110	0.180	0.248	0.101	0.110	0.180
55th	0.266	0.116	0.125	0.184	0.263	0.114	0.122	0.173
61st	0.296	0.144	0.166	0.272	0.288	0.135	0.153	0.232

Table 7: Nominal and Real expenditure Inequalities in Urban Areas

Rounds	Nominal				Real			
	Gini	Generalized Entropy			Gini	Generalized Entropy		
		GE(0)	GE(1)	GE(2)		GE(0)	GE(1)	GE(2)
50th	0.285	0.134	0.140	0.189	0.285	0.134	0.140	0.189
55th	0.304	0.158	0.187	0.708	0.300	0.153	0.176	0.567
61st	0.344	0.192	0.213	0.336	0.340	0.188	0.208	0.317

Table 8: Nominal and Real expenditure Inequalities in Rural Areas for 61st Round by Family Type

Family Type	Nominal Expenditure Inequality			Real Expenditure Inequality			Population Share
	GE (0)	GE(1)	GE(2)	GE (0)	GE(1)	GE(2)	
1 Adults only	0.200	0.208	0.269	0.190	0.195	0.246	0.083
2 Adults only	0.177	0.211	0.371	0.166	0.194	0.315	0.164
2 Adults and 1 Children only	0.143	0.162	0.233	0.134	0.150	0.207	0.143
2 Adults and 2 Children only	0.129	0.143	0.199	0.121	0.132	0.176	0.243
More than 2 adults and 2 Children	0.110	0.123	0.171	0.105	0.115	0.154	0.367
Within-group inequality	0.138	0.155	0.229	0.130	0.144	0.202	-
Between-group inequality	0.004	0.004	0.004	0.004	0.004	0.004	-
Total inequality	0.142	0.159	0.233	0.134	0.148	0.206	-

Table 9: Nominal and Real expenditure Inequalities in Urban Areas for 61st Round by Family Type

Family Type	Nominal Expenditure Inequality			Real Expenditure Inequality			Population Share
	GE (0)	GE(1)	GE(2)	GE (0)	GE(1)	GE(2)	
1 Adults only	0.209	0.212	0.283	0.205	0.206	0.271	0.164
2 Adults only	0.226	0.244	0.385	0.221	0.237	0.363	0.172
2 Adults and 1 Children only	0.197	0.213	0.315	0.193	0.207	0.299	0.155
2 Adults and 2 Children only	0.172	0.177	0.216	0.169	0.173	0.209	0.255
More than 2 adults and 2 Children	0.138	0.168	0.345	0.136	0.163	0.318	0.253
Within-group inequality	0.183	0.201	0.305	0.179	0.195	0.290	-
Between-group inequality	0.017	0.016	0.015	0.017	0.016	0.015	-
Total inequality	0.200	0.217	0.320	0.196	0.211	0.304	-

Table 10: Nominal and Real expenditure Inequalities in Rural Areas for 61st Round by Social Group

Social Group	Nominal Expenditure Inequality			Real Expenditure Inequality			Population Share
	GE (0)	GE(1)	GE(2)	GE (0)	GE(1)	GE(2)	
Scheduled Tribe (ST)	0.156	0.167	0.220	0.149	0.157	0.201	0.161
Scheduled Caste (SC)	0.116	0.133	0.206	0.110	0.125	0.181	0.173
Other Backward Class (OBC)	0.141	0.172	0.336	0.132	0.157	0.273	0.379
Others	0.137	0.156	0.229	0.129	0.143	0.200	0.287
Within-group inequality	0.138	0.160	0.266	0.130	0.148	0.227	-
Between-group inequality	0.006	0.006	0.006	0.006	0.006	0.006	-
Total inequality	0.144	0.166	0.272	0.136	0.154	0.233	-

Table 11: Nominal and Real expenditure Inequalities in Urban Areas for 61st Round by Social Group

Social Group	Nominal Expenditure Inequality			Real Expenditure Inequality			Population Share
	GE (0)	GE(1)	GE(2)	GE (0)	GE(1)	GE(2)	
Scheduled Tribe (ST)	0.176	0.182	0.253	0.173	0.177	0.240	0.079
Scheduled Caste (SC)	0.152	0.174	0.264	0.149	0.170	0.253	0.140
Other Backward Class (OBC)	0.172	0.198	0.364	0.169	0.193	0.336	0.357
Others	0.189	0.205	0.304	0.184	0.199	0.288	0.424
Within-group inequality	0.177	0.198	0.321	0.173	0.192	0.302	-
Between-group inequality	0.016	0.016	0.016	0.016	0.015	0.015	-
Total inequality	0.193	0.214	0.337	0.189	0.207	0.317	-

Table 12: Head Count Poverty Rates for 50th Round in Rural Areas

State		Over expenditure on four included commodity groups[a]				Over all items
	Poverty Line	Nominal[b] Poverty Rate (per capita)	Real Poverty Rate(per capita)	Nominal[b] Poverty Rate (per equiv.)	Real Poverty Rate (per equiv.)	Nominal Poverty Rate (per capita)
Andhra Pradesh	163.02	0.18	0.18	0.03	0.03	0.10
Assam	232.05	0.33	0.33	0.07	0.07	0.27
Bihar	212.16	0.52	0.52	0.18	0.18	0.45
Gujarat	202.11	0.21	0.21	0.05	0.05	0.15
Karnataka	186.63	0.27	0.27	0.07	0.07	0.20
Kerala	243.84	0.27	0.27	0.11	0.11	0.18
Madhya Pradesh	193.1	0.35	0.35	0.10	0.10	0.28
Maharashtra	194.94	0.33	0.33	0.11	0.11	0.24
Orissa	194.03	0.43	0.43	0.16	0.16	0.36
Punjab	233.79	0.13	0.13	0.02	0.02	0.08
Haryana	233.79	0.26	0.26	0.05	0.05	0.18
Himachal Pradesh	233.79	0.25	0.25	0.06	0.06	0.20
Delhi	233.79	0.06	0.06	0.00	0.00	0.02
Rajasthan	215.89	0.25	0.25	0.05	0.05	0.18
Tamil Nadu	196.53	0.32	0.32	0.13	0.13	0.23
Uttar Pradesh	213.01	0.39	0.39	0.12	0.12	0.29
West Bengal	220.74	0.37	0.37	0.07	0.07	0.29
All India	**205.84**	**0.31**	**0.31**	**0.09**	**0.09**	**0.26**

a. These included groups of item are: Food; Fuel and Light; Clothing, Bedding and Footwear; Miscellaneous.

b. The nominal poverty lines used in these calculations were obtained by scaling down the official poverty lines by multiplying them by the median budget share of the four commodity groups in total expenditure (0.944) in the 61st round.

Table 13: Head Count Poverty Rates for 55th Round in Rural Areas

State		Over Expenditure on four included commodity groups[a]				Over all items
	Poverty Line	Nominal[b] Poverty Rate (per capita)	Real Poverty Rate (per capita)	Nominal[b] Poverty Rate (per equiv.)	Real Poverty Rate (per equiv.)	Nominal Poverty Rate (per capita)
Andhra Pradesh	262.94	0.20	0.11	0.06	0.03	0.08
Assam	365.43	0.38	0.27	0.11	0.07	0.23
Bihar	333.07	0.54	0.43	0.17	0.10	0.37
Gujarat	318.94	0.19	0.14	0.06	0.03	0.09
Karnataka	309.59	0.28	0.17	0.10	0.05	0.12
Kerala	374.79	0.17	0.13	0.07	0.05	0.07
Madhya Pradesh	311.34	0.48	0.37	0.18	0.10	0.30
Maharashtra	318.63	0.33	0.23	0.12	0.06	0.18
Orissa	323.92	0.55	0.38	0.26	0.15	0.39
Punjab	362.68	0.12	0.07	0.02	0.01	0.05
Haryana	362.81	0.16	0.12	0.03	0.03	0.06
Himachal Pradesh	367.45	0.15	0.09	0.03	0.02	0.06
Delhi	362.68	0.06	0.04	0.03	0.03	0.01
Rajasthan	344.03	0.24	0.15	0.05	0.02	0.10
Tamil Nadu	307.64	0.28	0.20	0.12	0.08	0.14
Uttar Pradesh	336.88	0.43	0.33	0.13	0.08	0.25
West Bengal	362.68	0.41	0.27	0.13	0.07	0.27
All India	**327.56**	**0.33**	**0.24**	**0.11**	**0.07**	**0.20**

a. These included groups of item are: Food; Fuel and Light; Clothing, Bedding and Footwear; Miscellaneous.

b. The nominal poverty lines used in these calculations were obtained by scaling down the official poverty lines by multiplying them by the median budget share of the four commodity groups in total expenditure (0.944) in the 61st round.

Table 14: Head Count Poverty Rates for 61st Round in Rural Areas

State		Over Expenditure on four included commodity groups[a]				Over all items
	Poverty Line	Nominal[b] Poverty Rate (per capita)	Real Poverty Rate (per capita)	Nominal[b] Poverty Rate (per equiv.)	Real Poverty Rate (per equiv.)	Nominal Poverty Rate (per capita)
Andhra Pradesh	292.95	0.08	0.04	0.02	0.01	0.07
Assam	387.64	0.15	0.12	0.03	0.03	0.14
Bihar	354.36	0.31	0.26	0.04	0.02	0.31
Gujarat	353.93	0.28	0.18	0.07	0.04	0.11
Karnataka	324.17	0.16	0.10	0.03	0.02	0.14
Kerala	430.12	0.10	0.06	0.04	0.02	0.09
Madhya Pradesh	327.78	0.29	0.23	0.08	0.05	0.26
Maharashtra	362.25	0.23	0.14	0.07	0.03	0.20
Orissa	325.79	0.37	0.32	0.16	0.13	0.38
Punjab	410.38	0.06	0.03	0.01	0.00	0.06
Haryana	414.76	0.12	0.08	0.03	0.01	0.10
Himachal Pradesh	394.28	0.08	0.06	0.01	0.01	0.08
Delhi	410.38	0.02	0.00	0.00	0.00	0.02
Rajasthan	374.57	0.16	0.11	0.02	0.01	0.14
Tamil Nadu	351.86	0.16	0.09	0.05	0.02	0.16
Uttar Pradesh	365.84	0.26	0.20	0.05	0.03	0.25
West Bengal	382.82	0.20	0.14	0.04	0.02	0.21
All India	**356.3**	**0.18**	**0.13**	**0.05**	**0.03**	**0.18**

a. These included groups of item are: Food; Fuel and Light; Clothing, Bedding and Footwear; Miscellaneous.

b. The nominal poverty lines used in these calculations were obtained by scaling down the official poverty lines by multiplying them by the median budget share of the four commodity groups in total expenditure (0.944) in the 61st round.

Table 15: Head Count Poverty Rates for 50th Round in Urban Areas

State		Over Expenditure on four included commodity groups[a]				Over all items
	Poverty Line	Nominal[b] Poverty Rate (per capita)	Real Poverty Rate(per capita)	Nominal[b] Poverty Rate (per equiv.)	Real Poverty Rate (per equiv.)	Nominal Poverty Rate (per capita)
Andhra Pradesh	278.14	0.40	0.40	0.16	0.16	0.28
Assam	212.42	0.06	0.06	0.01	0.01	0.04
Bihar	238.49	0.28	0.28	0.07	0.07	0.25
Gujarat	297.22	0.26	0.26	0.09	0.09	0.20
Karnataka	302.89	0.40	0.40	0.18	0.18	0.29
Kerala	280.54	0.30	0.30	0.16	0.16	0.19
Madhya Pradesh	317.16	0.46	0.46	0.18	0.18	0.34
Maharashtra	328.56	0.34	0.34	0.15	0.15	0.24
Orissa	298.22	0.45	0.45	0.21	0.21	0.33
Punjab	253.61	0.10	0.10	0.02	0.02	0.05
Haryana	258.23	0.18	0.18	0.03	0.03	0.12
Himachal Pradesh	253.61	0.05	0.05	0.01	0.01	0.03
Delhi	309.48	0.12	0.12	0.05	0.05	0.07
Rajasthan	280.85	0.24	0.24	0.07	0.07	0.18
Tamil Nadu	296.63	0.47	0.47	0.23	0.23	0.32
Uttar Pradesh	258.65	0.32	0.32	0.08	0.08	0.25
West Bengal	247.53	0.21	0.21	0.09	0.09	0.13
All India	**281.35**	**0.30**	**0.30**	**0.11**	**0.11**	**0.19**

a. These included groups of item are: Food; Fuel and Light; Clothing, Bedding and Footwear; Miscellaneous.

b. The nominal poverty lines used in these calculations were obtained by scaling down the official poverty lines by multiplying them by the median budget share of the four commodity groups in total expenditure (0.919) in the 61st round.

Table 16: Head Count Poverty Rates for 55th Round in Urban Areas

State		Over Expenditure on four included commodity groups[a]				Over all items
	Poverty Line	Nominal[b] Poverty Rate (per capita)	Real Poverty Rate(per capita)	Nominal[b] Poverty Rate (per equiv.)	Real Poverty Rate (per equiv.)	Nominal Poverty Rate (per capita)
Andhra Pradesh	457.4	0.38	0.29	0.17	0.10	0.21
Assam	343.99	0.06	0.03	0.02	0.02	0.02
Bihar	379.78	0.35	0.26	0.11	0.06	0.24
Gujarat	474.41	0.27	0.18	0.09	0.06	0.12
Karnataka	511.44	0.38	0.26	0.19	0.11	0.20
Kerala	477.06	0.26	0.16	0.13	0.07	0.13
Madhya Pradesh	481.65	0.47	0.42	0.22	0.18	0.31
Maharashtra	539.71	0.36	0.27	0.19	0.12	0.21
Orissa	473.12	0.44	0.38	0.25	0.19	0.32
Punjab	388.15	0.12	0.09	0.04	0.03	0.03
Haryana	420.2	0.15	0.09	0.04	0.02	0.06
Himachal Pradesh	420.2	0.07	0.04	0.02	0.02	0.02
Delhi	505.45	0.15	0.10	0.05	0.03	0.07
Rajasthan	465.92	0.30	0.19	0.09	0.05	0.15
Tamil Nadu	475.6	0.37	0.28	0.21	0.15	0.18
Uttar Pradesh	416.29	0.38	0.29	0.12	0.07	0.24
West Bengal	409.22	0.22	0.13	0.10	0.06	0.11
All India	**454.11**	**0.29**	**0.21**	**0.12**	**0.08**	**0.17**

a. These included groups of item are: Food; Fuel and Light; Clothing, Bedding and Footwear; Miscellaneous.

b. The nominal poverty lines used in these calculations were obtained by scaling down the official poverty lines by multiplying them by the median budget share of the four commodity groups in total expenditure (0.919) in the 61st round.

Table 17: Head Count Poverty Rates for 61st Round in Urban Areas

State		Over Expenditure on four included commodity groups[a]				Over all items
	Poverty Line	Nominal[b] Poverty Rate (per capita)	Real Poverty Rate(per capita)	Nominal[b] Poverty Rate (per equiv.)	Real Poverty Rate (per equiv.)	Nominal Poverty Rate (per capita)
Andhra Pradesh	542.89	0.38	0.35	0.16	0.12	0.33
Assam	378.84	0.03	0.05	0.00	0.01	0.04
Bihar	435	0.36	0.37	0.08	0.08	0.38
Gujarat	541.16	0.39	0.41	0.17	0.18	0.21
Karnataka	599.66	0.40	0.37	0.21	0.17	0.36
Kerala	559.39	0.20	0.17	0.11	0.08	0.21
Madhya Pradesh	570.15	0.48	0.50	0.22	0.25	0.47
Maharashtra	665.9	0.35	0.30	0.20	0.16	0.32
Orissa	528.49	0.49	0.51	0.28	0.31	0.49
Punjab	466.16	0.09	0.09	0.01	0.01	0.08
Haryana	504.49	0.17	0.14	0.04	0.03	0.16
Himachal Pradesh	504.49	0.04	0.04	0.01	0.01	0.04
Delhi	612.91	0.14	0.11	0.03	0.02	0.12
Rajasthan	559.63	0.29	0.24	0.07	0.04	0.28
Tamil Nadu	547.42	0.34	0.34	0.16	0.17	0.30
Uttar Pradesh	483.26	0.36	0.35	0.10	0.09	0.36
West Bengal	449.32	0.14	0.15	0.04	0.04	0.15
All India	**538.6**	**0.28**	**0.26**	**0.11**	**0.10**	**0.27**

a. These included groups of item are: Food; Fuel and Light; Clothing, Bedding and Footwear; Miscellaneous.

b. The nominal poverty lines used in these calculations were obtained by scaling down the official poverty lines by multiplying them by the median budget share of the four commodity groups in total expenditure (0.919) in the 61st round.

Table 18: Nominal and Real Poverty Shares (per equiv.) in Rural Areas for 61st Round by Social Group

Social Group	Nominal Poverty			Real Poverty			Population Share
	FGT(0)	FGT(1)	FGT(2)	FGT(0)	FGT(1)	FGT(2)	
Scheduled Tribe (ST)	0.301	0.346	0.377	0.324	0.374	0.394	0.161
Scheduled Caste (SC)	0.239	0.233	0.233	0.233	0.231	0.234	0.173
Other Backward Class (OBC)	0.345	0.322	0.302	0.339	0.305	0.289	0.379
Others	0.115	0.098	0.088	0.105	0.090	0.082	0.287

Table 19: Nominal and Real Poverty Shares (per equiv.) in Urban Areas for 61st Round by Social Group

Social Group	Nominal Poverty			Real Poverty			Population Share
	FGT(0)	FGT(1)	FGT(2)	FGT(0)	FGT(1)	FGT(2)	
Scheduled Tribe (ST)	0.071	0.079	0.083	0.074	0.080	0.083	0.079
Scheduled Caste (SC)	0.224	0.225	0.220	0.228	0.225	0.219	0.140
Other Backward Class (OBC)	0.475	0.474	0.472	0.474	0.475	0.472	0.357
Others	0.230	0.221	0.225	0.224	0.220	0.226	0.424

Figures

Figure 1: Gini Coefficient for 61st Round at Varying Values of θ in Rural Sample

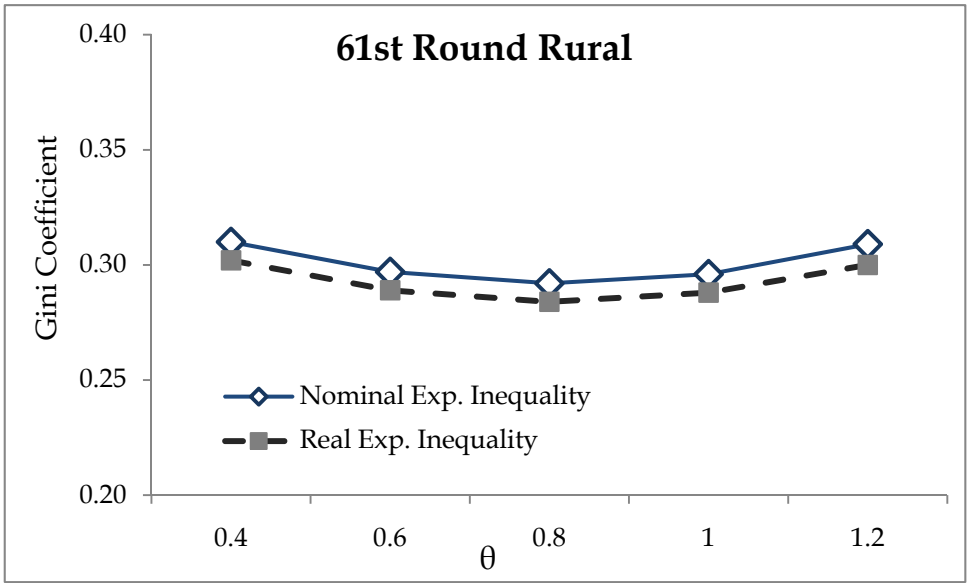


Figure 2: Gini Coefficient for 61st Round at Varying Values of θ in Urban Sample

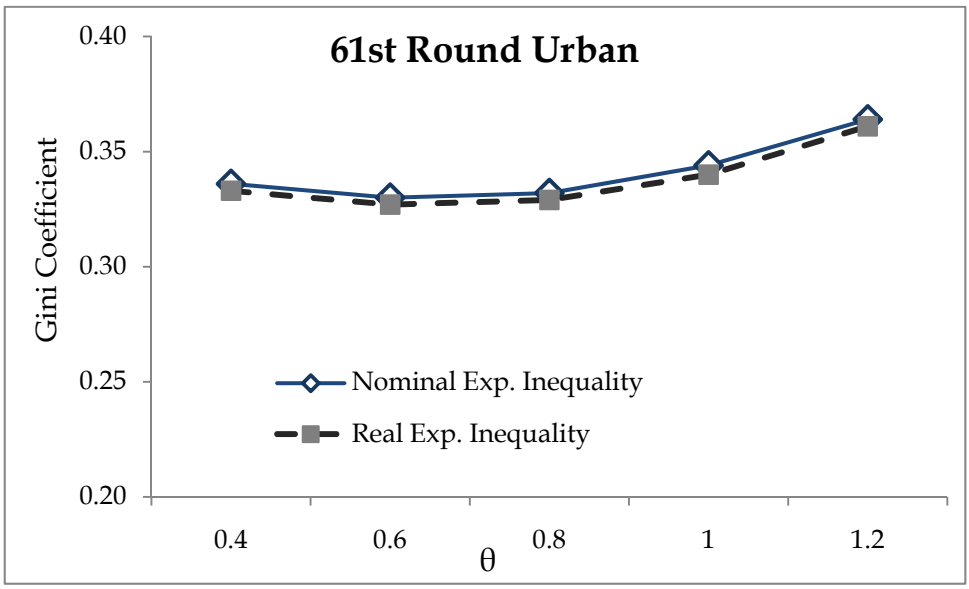


Figure 3: Head-Count Poverty Rates for 61st Round at Varying Values of θ in Rural Sample

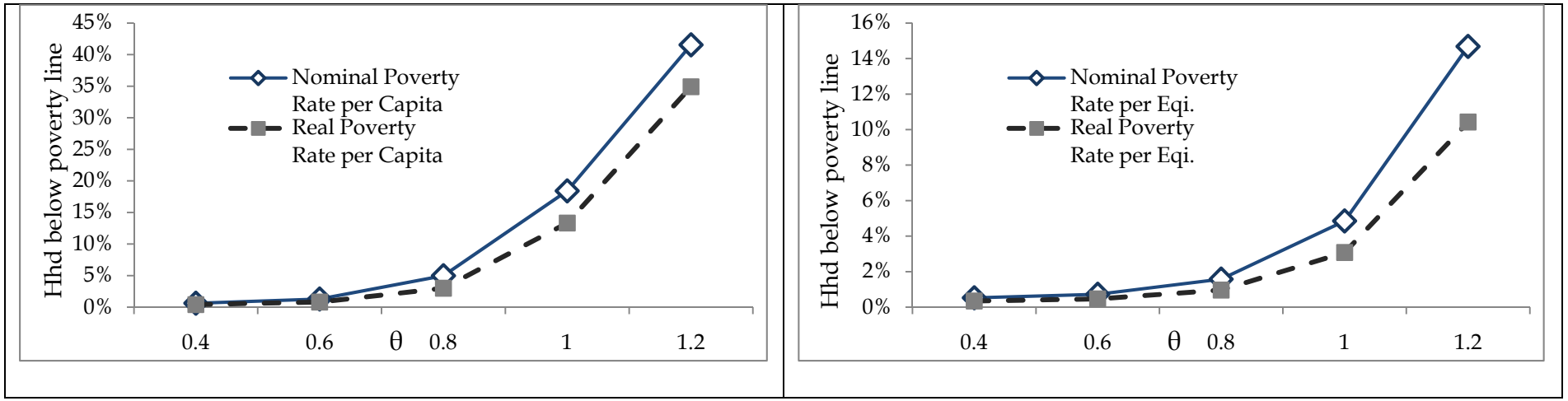
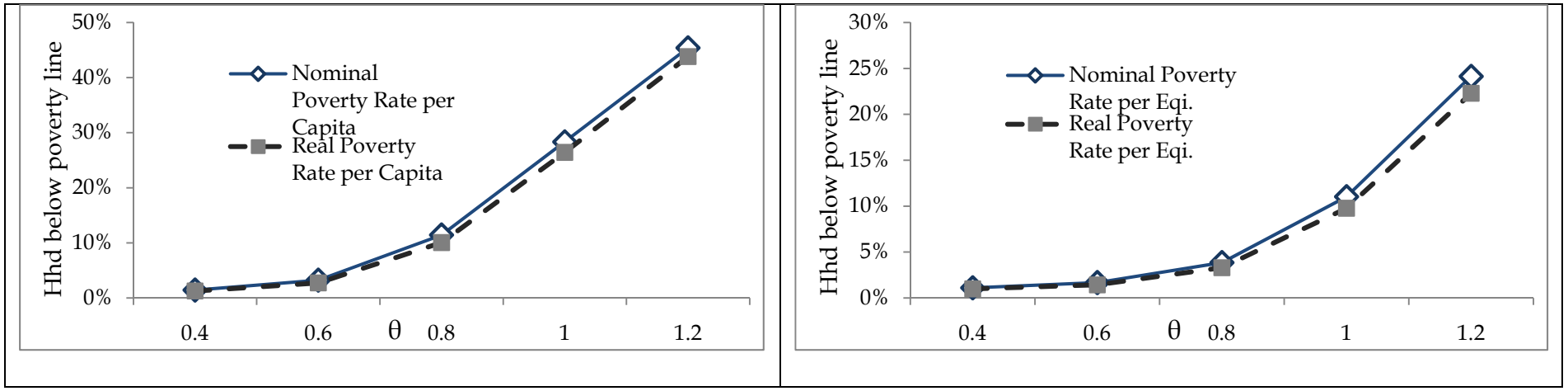


Figure 4: Head-Count Poverty Rates for 61st Round at Varying Values of θ in Urban Sample



Appendix

Table A1: State-Wise Nominal Expenditure Inequality for 50th Round in Rural Areas

States[a]	Gini	GE(0)	GE(1)	GE(2)
Andhra Pradesh	0.238	0.093	0.100	0.124
Assam	0.194	0.062	0.065	0.079
Bihar	0.218	0.077	0.080	0.093
Gujarat	0.217	0.077	0.077	0.085
Jammu & Kashmir	0.235	0.090	0.095	0.111
Karnataka	0.230	0.087	0.091	0.111
Kerala	0.272	0.119	0.124	0.145
Madhya Pradesh	0.251	0.111	0.169	0.977
Maharashtra	0.249	0.101	0.107	0.133
Orissa	0.232	0.088	0.092	0.109
Punjab	0.248	0.100	0.109	0.144
Rajasthan	0.223	0.081	0.084	0.097
Tamil Nadu	0.256	0.109	0.113	0.138
Uttar Pradesh	0.237	0.091	0.094	0.110
West Bengal	0.214	0.074	0.081	0.101
All India	**0.248**	**0.101**	**0.110**	**0.180**

a. Assam includes Manipur, Meghalaya and Tripura; Punjab includes Haryana, Himachal Pradesh and Delhi; Uttar Pradesh, Madhya Pradesh and Bihar include Uttaranchal, Chhattisgarh and Jharkhand since their inception (here only for 61st round).

Table A2: State-Wise Nominal Expenditure Inequality for 55th Round in Rural Areas

States[a]	Gini	GE(0)	GE(1)	GE(2)
Andhra Pradesh	0.240	0.095	0.103	0.129
Assam	0.211	0.072	0.075	0.087
Bihar	0.226	0.083	0.090	0.110
Gujarat	0.231	0.087	0.089	0.104
Jammu & Kashmir	0.209	0.070	0.073	0.083
Karnataka	0.255	0.108	0.113	0.139
Kerala	0.283	0.132	0.139	0.178
Madhya Pradesh	0.253	0.104	0.111	0.136
Maharashtra	0.257	0.109	0.119	0.160
Orissa	0.243	0.096	0.099	0.115
Punjab	0.247	0.101	0.112	0.183
Rajasthan	0.227	0.084	0.086	0.098
Tamil Nadu	0.285	0.142	0.185	0.590
Uttar Pradesh	0.252	0.105	0.114	0.161
West Bengal	0.226	0.084	0.086	0.098
All India	**0.266**	**0.116**	**0.125**	**0.184**

a. Assam includes Manipur, Meghalaya and Tripura; Punjab includes Haryana, Himachal Pradesh and Delhi; Uttar Pradesh, Madhya Pradesh and Bihar include Uttaranchal, Chhattisgarh and Jharkhand since their inception (here only for 61st round).

Table A3: State-Wise Nominal Expenditure Inequality for 61st Round in Rural Areas

States[a]	Gini	GE(0)	GE(1)	GE(2)
Andhra Pradesh	0.295	0.142	0.162	0.234
Assam	0.221	0.080	0.087	0.113
Bihar	0.225	0.082	0.089	0.109
Gujarat	0.257	0.107	0.116	0.147
Jammu & Kashmir	0.237	0.088	0.092	0.106
Karnataka	0.258	0.108	0.125	0.173
Kerala	0.347	0.199	0.235	0.437
Madhya Pradesh	0.279	0.126	0.143	0.211
Maharashtra	0.284	0.131	0.146	0.205
Orissa	0.290	0.136	0.150	0.209
Punjab	0.282	0.130	0.152	0.256
Rajasthan	0.252	0.107	0.131	0.235
Tamil Nadu	0.313	0.163	0.216	0.501
Uttar Pradesh	0.275	0.125	0.149	0.245
West Bengal	0.266	0.117	0.143	0.248
All India	**0.296**	**0.144**	**0.166**	**0.272**

a. Assam includes Manipur, Meghalaya and Tripura; Punjab includes Haryana, Himachal Pradesh and Delhi; Uttar Pradesh, Madhya Pradesh and Bihar include Uttaranchal, Chhattisgarh and Jharkhand since their inception (here only for 61st round).

Table A4: State-Wise Real Expenditure Inequality for 50th Round in Rural Areas

States[a]	Gini	GE(0)	GE(1)	GE(2)
Andhra Pradesh	0.238	0.093	0.100	0.124
Assam	0.194	0.062	0.065	0.079
Bihar	0.218	0.077	0.080	0.093
Gujarat	0.217	0.077	0.077	0.085
Jammu & Kashmir	0.235	0.090	0.095	0.111
Karnataka	0.230	0.087	0.091	0.111
Kerala	0.272	0.119	0.124	0.145
Madhya Pradesh	0.251	0.111	0.169	0.977
Maharashtra	0.249	0.101	0.107	0.133
Orissa	0.232	0.088	0.092	0.109
Punjab	0.248	0.100	0.109	0.144
Rajasthan	0.223	0.081	0.084	0.097
Tamil Nadu	0.256	0.109	0.113	0.138
Uttar Pradesh	0.237	0.091	0.094	0.110
West Bengal	0.214	0.074	0.081	0.101
All India	**0.248**	**0.101**	**0.110**	**0.180**

a. Assam includes Manipur, Meghalaya and Tripura; Punjab includes Haryana, Himachal Pradesh and Delhi; Uttar Pradesh, Madhya Pradesh and Bihar include Uttaranchal, Chhattisgarh and Jharkhand since their inception (here only for 61st round).

Table A5: State-Wise Real Expenditure Inequality for 55th Round in Rural Areas

States[a]	Gini	GE(0)	GE(1)	GE(2)
Andhra Pradesh	0.239	0.094	0.101	0.125
Assam	0.209	0.071	0.074	0.085
Bihar	0.225	0.082	0.088	0.107
Gujarat	0.229	0.086	0.087	0.101
Jammu & Kashmir	0.206	0.068	0.071	0.080
Karnataka	0.252	0.106	0.111	0.135
Kerala	0.280	0.128	0.134	0.169
Madhya Pradesh	0.252	0.102	0.109	0.133
Maharashtra	0.255	0.107	0.116	0.154
Orissa	0.242	0.094	0.098	0.113
Punjab	0.243	0.098	0.107	0.166
Rajasthan	0.225	0.083	0.084	0.095
Tamil Nadu	0.281	0.138	0.175	0.501
Uttar Pradesh	0.250	0.103	0.111	0.153
West Bengal	0.224	0.082	0.084	0.095
All India	**0.263**	**0.114**	**0.122**	**0.173**

a. Assam includes Manipur, Meghalaya and Tripura; Punjab includes Haryana, Himachal Pradesh and Delhi; Uttar Pradesh, Madhya Pradesh and Bihar include Uttaranchal, Chhattisgarh and Jharkhand since their inception (here only for 61st round).

Table A6: State-Wise Real Expenditure Inequality for 61st Round in Rural Areas

States[a]	Gini	GE(0)	GE(1)	GE(2)
Andhra Pradesh	0.287	0.135	0.150	0.209
Assam	0.215	0.076	0.082	0.102
Bihar	0.220	0.078	0.084	0.102
Gujarat	0.250	0.101	0.109	0.135
Jammu & Kashmir	0.229	0.082	0.086	0.098
Karnataka	0.252	0.103	0.117	0.158
Kerala	0.332	0.183	0.209	0.350
Madhya Pradesh	0.273	0.121	0.135	0.189
Maharashtra	0.277	0.125	0.137	0.185
Orissa	0.285	0.131	0.143	0.192
Punjab	0.272	0.121	0.138	0.211
Rajasthan	0.244	0.100	0.119	0.195
Tamil Nadu	0.302	0.152	0.193	0.395
Uttar Pradesh	0.267	0.117	0.137	0.210
West Bengal	0.258	0.110	0.131	0.210
All India	**0.288**	**0.135**	**0.153**	**0.232**

a. Assam includes Manipur, Meghalaya and Tripura; Punjab includes Haryana, Himachal Pradesh and Delhi; Uttar Pradesh, Madhya Pradesh and Bihar include Uttaranchal, Chhattisgarh and Jharkhand since their inception (here only for 61st round).

Table A7: State-Wise Nominal Expenditure Inequality for 50th Round in Urban Areas

States[a]	Gini	GE(0)	GE(1)	GE(2)
Andhra Pradesh	0.337	0.185	0.190	0.237
Assam	0.325	0.174	0.192	0.267
Bihar	0.370	0.225	0.253	0.407
Gujarat	0.343	0.205	0.254	0.504
Jammu & Kashmir	0.244	0.103	0.097	0.101
Karnataka	0.318	0.164	0.173	0.218
Kerala	0.435	0.313	0.344	0.515
Madhya Pradesh	0.350	0.211	0.249	0.423
Maharashtra	0.314	0.161	0.163	0.193
Orissa	0.347	0.196	0.214	0.290
Punjab	0.371	0.227	0.255	0.386
Rajasthan	0.281	0.129	0.125	0.134
Tamil Nadu	0.345	0.195	0.215	0.323
Uttar Pradesh	0.363	0.217	0.248	0.380
West Bengal	0.302	0.148	0.162	0.211
All India	**0.285**	**0.134**	**0.140**	**0.189**

a. Assam includes Manipur, Meghalaya and Tripura; Punjab includes Haryana, Himachal Pradesh and Delhi; Uttar Pradesh, Madhya Pradesh and Bihar include Uttaranchal, Chhattisgarh and Jharkhand since their inception (here only for 61st round).

Table A8: State-Wise Nominal Expenditure Inequality for 55th Round in Urban Areas

States[a]	Gini	GE(0)	GE(1)	GE(2)
Andhra Pradesh	0.290	0.137	0.140	0.168
Assam	0.250	0.105	0.104	0.118
Bihar	0.311	0.159	0.172	0.226
Gujarat	0.279	0.131	0.142	0.211
Jammu & Kashmir	0.229	0.085	0.085	0.094
Karnataka	0.285	0.140	0.137	0.160
Kerala	0.301	0.153	0.149	0.169
Madhya Pradesh	0.295	0.140	0.149	0.184
Maharashtra	0.309	0.163	0.173	0.303
Orissa	0.309	0.158	0.167	0.214
Punjab	0.278	0.130	0.132	0.158
Rajasthan	0.268	0.116	0.122	0.152
Tamil Nadu	0.347	0.218	0.369	3.414
Uttar Pradesh	0.292	0.139	0.145	0.176
West Bengal	0.348	0.231	0.421	3.980
All India	**0.304**	**0.158**	**0.187**	**0.708**

a. Assam includes Manipur, Meghalaya and Tripura; Punjab includes Haryana, Himachal Pradesh and Delhi; Uttar Pradesh, Madhya Pradesh and Bihar include Uttaranchal, Chhattisgarh and Jharkhand since their inception (here only for 61st round).

Table A9: State-Wise Nominal Expenditure Inequality for 61st Round in Urban Areas

States[a]	Gini	GE(0)	GE(1)	GE(2)
Andhra Pradesh	0.340	0.189	0.220	0.368
Assam	0.294	0.138	0.152	0.216
Bihar	0.329	0.173	0.192	0.264
Gujarat	0.317	0.161	0.172	0.229
Jammu & Kashmir	0.262	0.109	0.115	0.136
Karnataka	0.340	0.188	0.206	0.305
Kerala	0.363	0.217	0.233	0.341
Madhya Pradesh	0.343	0.190	0.224	0.384
Maharashtra	0.361	0.215	0.231	0.340
Orissa	0.345	0.192	0.221	0.369
Punjab	0.331	0.178	0.211	0.436
Rajasthan	0.300	0.145	0.165	0.239
Tamil Nadu	0.361	0.212	0.237	0.367
Uttar Pradesh	0.336	0.181	0.203	0.287
West Bengal	0.332	0.177	0.190	0.250
All India	**0.344**	**0.192**	**0.213**	**0.336**

a. Assam includes Manipur, Meghalaya and Tripura; Punjab includes Haryana, Himachal Pradesh and Delhi; Uttar Pradesh, Madhya Pradesh and Bihar include Uttaranchal, Chhattisgarh and Jharkhand since their inception (here only for 61st round).

Table A10: State-Wise Real Expenditure Inequality for 50th Round in Urban Areas

States[a]	Gini	GE(0)	GE(1)	GE(2)
Andhra Pradesh	0.337	0.185	0.190	0.237
Assam	0.325	0.174	0.192	0.267
Bihar	0.370	0.225	0.253	0.407
Gujarat	0.343	0.205	0.254	0.504
Jammu & Kashmir	0.244	0.103	0.097	0.101
Karnataka	0.318	0.164	0.173	0.218
Kerala	0.435	0.313	0.344	0.515
Madhya Pradesh	0.350	0.211	0.249	0.423
Maharashtra	0.314	0.161	0.163	0.193
Orissa	0.347	0.196	0.214	0.290
Punjab	0.371	0.227	0.255	0.386
Rajasthan	0.281	0.129	0.125	0.134
Tamil Nadu	0.345	0.195	0.215	0.323
Uttar Pradesh	0.363	0.217	0.248	0.380
West Bengal	0.302	0.148	0.162	0.211
All India	**0.285**	**0.134**	**0.140**	**0.189**

a. Assam includes Manipur, Meghalaya and Tripura; Punjab includes Haryana, Himachal Pradesh and Delhi; Uttar Pradesh, Madhya Pradesh and Bihar include Uttaranchal, Chhattisgarh and Jharkhand since their inception (here only for 61st round).

Table A11: State-Wise Real Expenditure Inequality for 55th Round in Urban Areas

States[a]	Gini	GE(0)	GE(1)	GE(2)
Andhra Pradesh	0.286	0.134	0.137	0.162
Assam	0.247	0.103	0.102	0.114
Bihar	0.307	0.155	0.167	0.217
Gujarat	0.275	0.127	0.137	0.198
Jammu & Kashmir	0.226	0.082	0.083	0.091
Karnataka	0.282	0.136	0.133	0.154
Kerala	0.298	0.150	0.145	0.164
Madhya Pradesh	0.292	0.137	0.145	0.177
Maharashtra	0.305	0.158	0.167	0.275
Orissa	0.305	0.154	0.162	0.206
Punjab	0.274	0.127	0.128	0.152
Rajasthan	0.265	0.113	0.118	0.146
Tamil Nadu	0.338	0.207	0.330	2.599
Uttar Pradesh	0.289	0.136	0.141	0.170
West Bengal	0.338	0.218	0.373	3.050
All India	**0.300**	**0.153**	**0.176**	**0.567**

a. Assam includes Manipur, Meghalaya and Tripura; Punjab includes Haryana, Himachal Pradesh and Delhi; Uttar Pradesh, Madhya Pradesh and Bihar include Uttaranchal, Chhattisgarh and Jharkhand since their inception (here only for 61st round).

Table A12: State-Wise Real Expenditure Inequality for 61st Round in Urban Areas

States[a]	Gini	GE(0)	GE(1)	GE(2)
Andhra Pradesh	0.337	0.185	0.214	0.348
Assam	0.291	0.135	0.148	0.207
Bihar	0.327	0.170	0.188	0.255
Gujarat	0.313	0.158	0.168	0.220
Jammu & Kashmir	0.259	0.106	0.112	0.132
Karnataka	0.337	0.184	0.201	0.292
Kerala	0.359	0.212	0.227	0.325
Madhya Pradesh	0.340	0.186	0.218	0.363
Maharashtra	0.357	0.210	0.225	0.323
Orissa	0.342	0.189	0.216	0.351
Punjab	0.327	0.173	0.202	0.393
Rajasthan	0.297	0.142	0.160	0.228
Tamil Nadu	0.357	0.207	0.231	0.349
Uttar Pradesh	0.333	0.178	0.198	0.276
West Bengal	0.329	0.174	0.186	0.242
All India	**0.340**	**0.188**	**0.208**	**0.317**

a. Assam includes Manipur, Meghalaya and Tripura; Punjab includes Haryana, Himachal Pradesh and Delhi; Uttar Pradesh, Madhya Pradesh and Bihar include Uttaranchal, Chhattisgarh and Jharkhand since their inception (here only for 61st round).