Growth and Inequality in the Distribution of India's Consumption Expenditure: 1983 to 2009–10

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This paper undertakes an assessment of the evolution of inequality in the distribution of consumption expenditure in India over the last quarter-century, from 1983 to 2009–10, employing data available in the quinquennial "thick" surveys of the National Sample Survey Office. We find that plausible adjustments to the data, along with an emphasis on "centrist" rather than "rightist" or "leftist" inequality measures, lead to a picture of widening over-time inequality in the distribution of consumption expenditure, which is at odds with the impression of more or less unchanging inequality conveyed in some of the literature available on the subject in India.

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1 Introduction

In the absence of systematic data on the distribution of income in India, it is to data on the distribution of consumption expenditure that one turns in order to assess trends in growth and inequality for a money-metric welfare indicator. In the common perception, India's impressive record of per capita income growth in the last three decades or so has also been accompanied by a widening of inequality, and it appears to be reasonable to expect that a similar trend must hold true for the growth in, and distribution of, consumption expenditure. However, the National Sample Survey Office's (NSSO) data on consumption expenditure, available in its quinquennial "thick" samples over the (roughly) 30-year period from 1983 to 2009–10, display—especially in the rural areas—not much in the way of growth; and commentators such as Ahluwalia (2011) and Bhalla (2011) see little evidence of a secular rise in inequality (again, especially in the rural areas).

In this paper, we suggest that both impressions thrown up by the data may have to be revised. The growth picture, it is possible, might benefit from amendment if the NSSO's estimates of per capita mean consumption are revised in line with the Central Statistics Office's (CSO) National Accounts Statistics (NAS) estimates of per capita mean consumption: the NSSO estimates are generally lower than the NAS estimates, and the divergence between the two has increased over time. In the 1980s, the Planning Commission (1985) began to compute headcount ratios of poverty from the NSSO consumption surveys after "adjusting" these survey data: the "adjustment" took the form of scaling up each individual's reported consumption by the ratio of the NAS estimate of mean consumption to the NSS estimate of mean consumption, so that, in effect, resort was had to an employment of the NSS relative distribution of consumption and the NAS estimate of mean consumption. This procedure of adjustment came under severe criticism from scholars such as Minhas (1988); and, indeed, an Expert Group on Poverty set up by the Planning Commission, in its *Report* (Planning Commission 1993) recommended discontinuation of resort to such adjustment. The principal reason for this adverse criticism resided in the observation that the NSS estimates of consumption fell short of the NAS estimates mainly at the *upper* end of the expenditure distribution: this being the case, poverty estimates were unlikely to be affected by the divergence between the NSS and NAS estimates of mean consumption.

A similar stricture, however, would not hold if the objective is to capture elements of growth in per capita consumption expenditure or of the evolution of mean-dependent measures of inequality. It is important to clarify that we do *not* recommend the adjustment procedure described above. However, we do resort to it, largely as a gesture toward a certain sort of analytical completeness in our assessment, and in order to spell out the implications of such adjustment for an over-time evaluation of inequality in the distribution of consumption expenditure, from the consideration that this should be of particular interest to those researchers who do advocate the adoption of adjustment.

A data problem which *is* of salience in an assessment of the evolution of consumption expenditure inequality is the quality of the the NSSO's 55th round (1999–2000) consumption expenditure survey. It has been widely held—for a particularly comprehensive and persuasive critique, see Sen (2001)—that the 55th round's experiment of changing the recall period in the schedule it canvassed has been instrumental in grossly underestimating inequality in that round. This has essentially rendered the 55th round estimates unusable, and in our empirical exercise we accordingly drop 1999–2000 from our set of data points.

Apart from the problem of data is a problem of conceptual adequacy in addressing the issue of inequality. It is pertinent to note that the Ahluwalia–Bhalla diagnosis of roughly unchanging over-time inequality is largely a function of the sort of inequality measure employed: the standard Gini coefficient is a wholly *relative* measure of inequality, and we advocate a more plural approach to inequality assessment, one which finds space for both *absolute* and *intermediate* measures of inequality (see also, in this connection, Jayaraj and Subramanian 2012; Subramanian and Jayaraj 2013). A particularly useful intermediate measure of inequality is the Krtscha (1994) measure. It is our belief that the literature on alternative conceptualisations of inequality has tended to be largely confined to a somewhat rarefied theoretical plane, when it ought to be incorporated more routinely into mainstream applied work.[1] Subramanian (2014) provides a reasonably accessible exposition of some salient features of that literature: we draw briefly on that work to present some background material on measurement, with a particular emphasis on the Krtscha index of inequality (1994). We then undertake some empirical exercises aimed at incorporating modifications to both data and measurement in tracking changes in inequality over time.

These issues are elaborated on in the rest of the paper.

2 Consumption Expenditure: Preliminary Impressions

We have examined unit-level data, available on CD-ROMs, on the distribution of consumption expenditure over six points in time coinciding with the quinquennial, thick sample surveys conducted by the NSSO, in 1983, 1987–88, 1993–94, 1999–2000, 2004–05 and 2009–10. Table 1 summarises the information available, for both rural and urban India, on population, on per capita real consumption expenditure (that is, at 1983 prices, obtained by employing the Consumer Price Index for Agricultural Labourers (CPIAL) as the price deflator in the rural areas, and the Consumer Price Index for Industrial Workers (CPIIW) as the price deflator in the urban areas), and on the Gini coefficient of inequality in the distribution of consumption expenditure. Over the 26-year period from 1983 to 2009–10, the annual compound rate of growth in per capita consumption works out to a very modest 1.44% in the rural areas; in the urban areas, the relevant growth rate is somewhat healthier, at 2.98%, but still quite small compared to the around 5% growth in India's per capita income. The Gini coefficient of inequality displays no particular trend of a rise in the rural areas, although it does betray a rising trend in the urban areas: given the dominating share of the rural population in aggregate population, the combined (rural-cum-urban) picture of over-time inequality is likely to lean closer to the rural picture. The overall general impression which one obtains of the picture of consumption expenditure in India over the period 1983 to 2009–10, then, is one of little growth and a rough stationarity in the inequality of its distribution.

Table 1: Population and Mean Consumption Expenditure: India, 1983 to 2009–10

Year	Rural Population (in millions)	Urban Population (in millions)	Rural Average per Capita Consumption Expenditure in 1983 Rupees	Urban Average per Capita Consumption Expenditure in 1983 Rupees	Gini Index of Inequality (Rural)	Gini Index of Inequality (Urban)
1983	543.3	169.7	112.63	165.70	0.3162	0.3392
1987–88	595.2	198.2	127.32	186.04	0.3016	0.3568
1993–94	660.9	236.2	128.20	215.34	0.2855	0.3442
1999–2000	730.3	278.4	141.96	242.22	0.2630	0.3465
2004–05	777.6	319.5	148.07	245.47	0.3048	0.3759
2009–10	823.6	366.8	163.51	299.16	0.2992	0.3932

Mean consumption expenditure levels in 1983 prices have been obtained by employing the CPIAL as the price deflator in the rural areas, and the CPIIW as the price deflator in the urban areas. The Gini coefficient has been computed by estimating the equation of the Lorenz curve from the relevant grouped NSSO data in the various published NSSO surveys on consumer expenditure, via the so-called "beta function" approach, as codified in a computer programme (POVCAL) for the World Bank by Chen, Datt and Ravallion (1992).
Sources: (1) Population for the Census Years 1981 and 1991 is from: Census of India 1991, Series I: Final Population Totals: Brief Analysis of Primary Census Abstract ; population for the year 2001 is from: Census of India 2001, Series 1: Final Population Totals; and population for the year 2011 is from Census of India 2011, Provisional Population Totals, Paper 2, Volume 1 of 2011, Rural-Urban Distribution, India-Series 1: available at: http://www.censusindia.gov.in/2011-prov-results/paper2/prov_results_paper2_india.htm, accessed on 1 May 2012.
(2) Consumption expenditure data are from various reports listed in the section on Major Data Sources Accessed (subsection 1).
(3) Data on consumer price indices are from the section on major data sources accessed for the CPIAL and the CPIIW.

It is pertinent to note that the 55th round of the NSS consumption survey for the year 1999–2000 departed from the usual convention of canvassing a schedule for a uniform 30-day period, as had been the convention in all the quinquennial thick samples from 1977–78 onward. In the 55th round, three schedules were canvassed: one for a 7-day recall period, one for a 30-day recall period, and one—exclusively for certain items of consumption such as education, institutional health, clothing, footwear, and durable goods—for a 365-day recall period. As pointed out by Sen (2001), the thin sample experiments conducted in the preceding 51st to 54th rounds clearly suggested that the estimate of food expenditure (in which the

poor specialise) was greater for the 7-day schedule than for the 30-day schedule, while relative inequality in the consumption of items canvassed in the 365-day schedule was smaller than for the 30-day recall period. Allowing for what Sen (2001) calls "contamination" of the 30-day schedule by the 7-day schedule, and for the relative understatement of the expenditure of the richer classes in the 365-day schedule, the net effect of the multiple recall periods deployed in the 55th round was perhaps to considerably understate relative inequality in the distribution of consumption expenditure in the 55th round.

This inference is supported by the figures in Table 2 which presents, for each of the rural and the urban areas, the round-to-round rates of growth in decile-specific mean consumption levels, from 1983 to 2009–10. Considering the rural areas first, it is instructive to compare the pattern of growth between 1987–88 and 1993–94 with that between 1999–2000 and 2004–05. While the mean consumption expenditure has increased between 1987–88 and 1993–94 by just 88 paise, this increase has been of the order of Rs 6.11 between 1999–2000 and 2004–05. The small increase in consumption between 1987–88 and 1993–94 has been shared by all income groups except the tenth decile. This is not inconsistent with the expectation that in a period of overall stagnation the rich might be in a position to adjust their consumption expenditure downward, while the poor, who are already committed to a subsistence level of consumption, are unlikely to be similarly placed. On the other hand, over the period 1999–2000 to 2004–05, despite the relatively large increase in mean consumption, there is actually a negative rate of growth of mean consumption for the poorest seven deciles of the population. This strongly suggests a relative overestimation of the expenditure levels of the poor in 1999–2000: the dip in the value of the relative Gini coefficient between 1993–94 and 1999–2000, and its subsequent rise between 1999–2000 and 2004–05, supports this suggestion. In the urban areas, the growth rate of the overall mean is very small over the period 1999–2000 to 2004–05; yet, again the poorest seven deciles have experienced negative rates of growth in their mean consumption levels, when one might have expected behaviour closer to what obtained in the rural areas over the period 1987–88 to 1993–94. This again suggests that the year 1999–2000 is problematic from a data point of view. In sum, the 55th round bucks the trend so strongly that its inclusion in any time-series study of inequality trends is bound to be misleading. There is therefore considerable reason for agreeing with Sen's (2001: 34) overall assessment of the 55th round:

> …the limited results now available from the 55th Round show clearly that answers to both the one week and 30 day questions have been contaminated by the presence of the other. Quite possibly, exclusive reliance on the 365-day question in the case of clothing etc. has also altered responses. As a result, consumption estimates from this round are not comparable to those from previous NSS rounds, and will probably be virtually useless for any assessment of changes in consumer demand between 2000 and 2005.

In light of the preceding discussion, we shall drop the year 1999–2000 from our data set and confine ourselves to the five data points 1983–84, 1987–88, 1993–94, 2004–05 and 2009–10. But before attending to these empirical issues we first address some necessary preliminaries of concepts and definitions in the measurement of inequality.

3 Alternative Conceptions of Inquality

An inequality measure is a function I which assigns a real number to every (non-negative) n-vector $\boldsymbol{x} = (x_1,..., x_i,..., x_n)$: $\boldsymbol{x}$ is an income distribution and the typical element x_i of $\boldsymbol{x}$ stands for the income of person i in a community of n individuals. For every $\boldsymbol{x}$, $n(\boldsymbol{x})$ is the dimensionality, and $\mu(\boldsymbol{x}) \equiv (1/n(\boldsymbol{x}))\sum_{i=1}^{n(x)} x_i$ is the mean, of the distribution $\boldsymbol{x}$.

The predominant emphasis in the theoretical literature on inequality measurement is on what are called *relative* measures of inequality, and this is perhaps even more so the case in the applied literature.[2] A relative measure of inequality is one

Table 2: Consumption Decile Means and Their Growth Rates: Rural and Urban India, 1983 to 2009–10

	Mean Consumption Expenditure in 1983 Prices						Growth Rates				
Deciles	1983	1987–88	1993–94	1999–2000	2004–05	2009–10	1983–88	1988–94	1994–2000	2000–05	2005–10
Rural											
1st	42.21	50.16	53.04	62.79	60.44	66.55	3.51	0.93	2.85	-0.76	1.94
2nd	57.28	66.71	69.80	80.57	78.51	87.68	3.09	0.76	2.42	-0.52	2.23
3rd	67.87	77.76	80.86	92.80	90.46	101.21	2.76	0.65	2.32	-0.51	2.27
4th	78.18	88.41	91.44	104.60	102.00	114.10	2.49	0.56	2.27	-0.50	2.27
5th	89.04	99.63	102.52	116.93	114.22	127.64	2.27	0.48	2.22	-0.47	2.25
6th	101.15	112.22	114.86	130.56	128.05	142.86	2.10	0.39	2.16	-0.39	2.21
7th	115.47	127.31	129.56	146.57	144.84	161.22	1.97	0.29	2.08	-0.24	2.17
8th	134.02	147.25	148.81	167.09	167.40	185.75	1.90	0.18	1.95	0.04	2.10
9th	162.73	179.15	179.22	198.44	204.38	225.71	1.94	0.01	1.71	0.59	2.01
10th	278.39	324.59	311.91	319.28	390.38	422.34	3.12	-0.66	0.39	4.10	1.59
All	112.63	127.32	128.20	141.96	148.07	163.51	2.48	0.12	1.71	0.85	2.00
Urban											
1st	56.91	62.05	72.48	82.02	75.11	88.18	1.74	2.62	2.08	-1.74	3.26
2nd	77.26	81.99	96.97	108.14	101.06	119.14	1.19	2.84	1.83	-1.35	3.35
3rd	92.31	98.47	116.86	130.23	123.37	145.44	1.30	2.90	1.82	-1.08	3.35
4th	107.31	115.51	137.24	153.13	146.74	173.01	1.48	2.92	1.84	-0.85	3.35
5th	123.46	134.22	159.42	178.21	172.56	203.64	1.69	2.91	1.87	-0.64	3.37
6th	141.81	155.78	184.73	206.94	202.45	239.37	1.90	2.88	1.91	-0.44	3.41
7th	164.02	182.12	215.32	241.74	239.09	283.64	2.11	2.83	1.95	-0.22	3.48
8th	193.59	217.42	255.73	287.77	288.31	344.00	2.35	2.74	1.99	0.04	3.60
9th	241.10	274.43	319.69	360.66	367.95	443.90	2.62	2.58	2.03	0.40	3.82
10th	459.25	538.39	594.96	673.34	738.02	951.28	3.23	1.68	2.08	1.85	5.21
All	165.70	186.04	215.34	242.22	245.47	299.16	2.34	2.47	1.98	0.27	4.04

Decile means in constant (1983) prices have been computed by estimating the equation of the Lorenz curve from the relevant grouped NSSO data in the various published NSSO surveys on consumer expenditure, via the so-called "beta function" approach, as codified in a computer programme (POVCAL) for the World Bank by Chen, Datt and Ravallion (1992).
Source: See the section on Major Data Sources Accessed.

whose value remains unchanged when every income in an income distribution is uniformly scaled up or down by the same proportionate factor. A very well-known relative inequality measure is the coefficient of variation which is given, for every income distribution $\boldsymbol{x}$, by the following expression:

$$CV(\mathbf{x}) = (1/\mu(\mathbf{x}))\left[\sum_{i=1}^{n(\mathbf{x})}\left(\frac{(x_i - \mu(\mathbf{x}))^2}{n(\mathbf{x})}\right)\right]^{1/2} \quad ...(1)$$

The standard deviation—a widely-employed measure of dispersion in the statistical literature—is just the coefficient of variation times the mean income of a distribution, and is given, for every income distribution $\boldsymbol{x}$, by the expression

$$SD(\mathbf{x}) = \left[\sum_{i=1}^{n(\mathbf{x})}\left(\frac{(x_i - \mu(\mathbf{x}))^2}{n(\mathbf{x})}\right)\right]^{1/2} \quad ...(2)$$

The standard deviation is an example of an absolute inequality measure, an absolute measure being one whose value remains unchanged when every income in an income distribution has the same income added to, or subtracted from, it.

Kolm (1976a, b) identified the normative bases underlying relative and absolute inequality measures, when he referred to the former as "rightist," and to the latter as "leftist," measures, from the consideration that in the presence of income-growth, viewing interpersonal disparities in terms of the ratio of incomes could be construed as reflecting a conservative judgment, while viewing these disparities in terms of the absolute difference in incomes could be construed as reflecting a radical judgment. (The characterisation of relative measures as rightist and of absolute measures as leftist would be switched around in the presence of income-*regression*.) It is conceivable that both approaches to the conceptualisation of inequality are predicated on polar extremes; and that a more moderately orientated conception is one that would endorse the notion of "intermediate" or "centrist" measures (Kolm 1976a, b). A centrist inequality measure is one whose value registers an increase when every income in an income distribution is uniformly scaled up by the same proportionate factor, and a decline in value when every income in an income distribution has the same income added to it.

A particularly attractive centrist measure of inequality is the measure K due to Krtscha (1994), which is given, for every income distribution $\mathbf{x}$, by the expression:

$$K(\mathbf{x}) = (1/n(\mathbf{x})\mu(\mathbf{x}))[\sum_{i=1}^{n(\mathbf{x})}(x_i - \mu(\mathbf{x}))^2] \quad ...(3)$$

It turns out that the Krtscha measure is just the product of the relative coefficient of variation measure and the absolute standard deviation measure: for every income distribution $\mathbf{x}$,

$$K(\mathbf{x}) = CV(\mathbf{x}).SD(\mathbf{x}) \quad ...(4)$$

The attractiveness of the Krtscha measure resides in two important properties it satisfies. The first is the property of *unit consistency*. Unit consistency requires that the ranking of income distributions by any inequality index should be invariant with respect to the units in which income is measured. This is an elementary requirement of coherence in an inequality measure. Every relative inequality measure satisfies unit consistency (and indeed, as we have seen, scale-invariance, which is the property that an inequality measure's value remains unchanged irrespective of the units in which income is measured). Not all absolute or centrist measures are unit-consistent. The standard deviation is an absolute measure that is unit-consistent. Intermediate measures proposed by Kolm (1976a,b) and Bossert and Pfingsten (1990) are, unfortunately, not unit consistent. In contrast, and as Zheng (2007) points out, the Krtscha measure does satisfy unit consistency.

The second attractive property of the Krtscha index is that of *subgroup decomposability*. This is a property—(Shorrocks 1988, among others)—which ensures that for any partitioning of a population into subgroups, the inequality measure can be exactly and exhaustively decomposed into a within-group component (that is, as a weighted sum of subgroup inequality levels, the weights being the groups' population shares or income shares or some combination of these shares), and a between-group component (which is the inequality measure obtained by replacing the incomes in each subgroup by the subgroup's mean income). In the case of the Krtscha index, the within-group component is given by the income-share-weighted sum of subgroup inequality levels; and the residual constitutes the between-group component. Subgroup decomposability is a particularly useful property when one wishes to assess the inter-group inclusiveness or otherwise of the distribution of income or wealth over time.

The absolute Gini coefficient and the intermediate Gini coefficient are examples of mean-dependent inequality measures which are not subgroup decomposable. The Krtscha Index gains much of its attractiveness from being an intermediate index which is easily interpretable as a product of two well-known measures, one of which is relative (the coefficient of variation) and the other absolute (the standard deviation); and furthermore, it satisfies, unlike other known intermediate indices, the properties of both unit-consistency and subgroup decomposability (Zheng 2007).

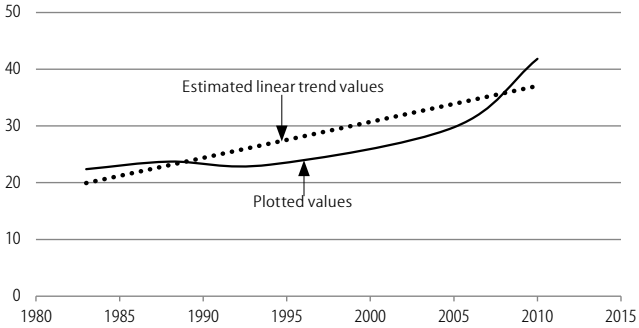
Finally, it should be noted that absolute and intermediate inequality measures are mean-dependent: consequently, inequality comparisons based on such measures have to be done in "real" terms. Specifically, in cross-section comparisons, one would have to resort to the use of appropriate exchange-rates so that incomes measured in different currencies can be reduced to a common standard. Similarly, in time-series comparisons, one would have to resort to the use of appropriate price indices in order that the effects of over-time price changes may be eliminated from incomes measured in nominal terms.

We strongly believe there is a case for a wider acceptance of the Krtscha index in routine applied work: the rest of this paper is devoted to an empirical asessment of inequality in the distribution of consumption expenditure in India.

4 Consumption Expenditure Inequality in India, 1983 to 2009–10

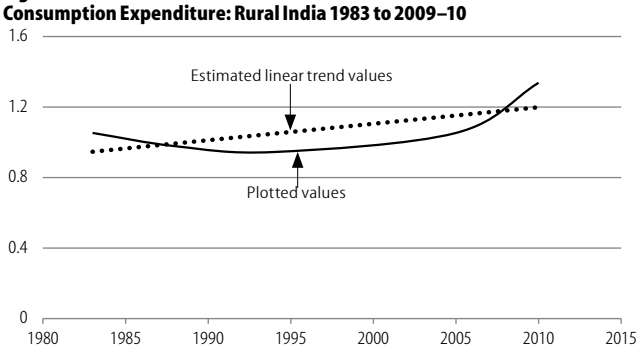
We consider the evolution of inequality in the distribution of consumption expenditure over the period 1983 to 2009–10. We have six data-points over this 26-year period: 1983, 1987–88, 1993–94, 1999–2000, 2004–05 and 2009–10. These are the

Figure 1a: Time-Profile of the Standard Deviation in the Distribution of Consumption Expenditure: Rural India 1983 to 2009–10



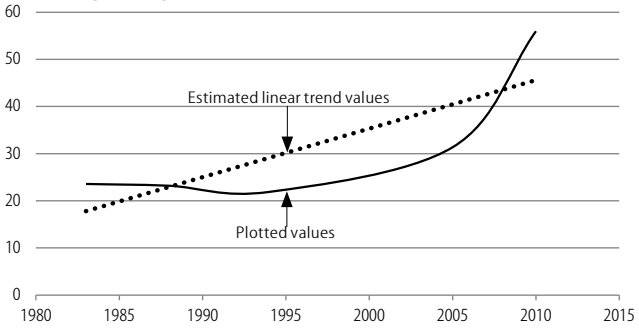
Source: Based on authors' computations.

Figure 1b: Time-Profile of the Coefficient of Variation in the Distribution of Consumption Expenditure: Rural India 1983 to 2009–10



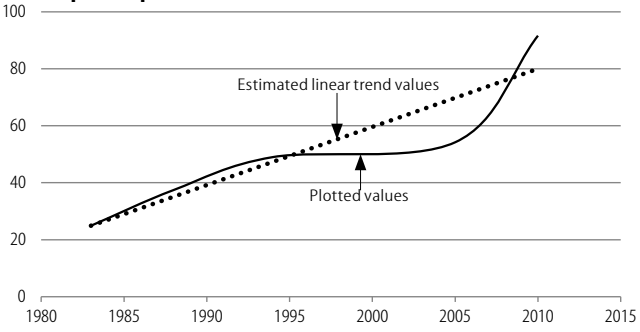
Source: Based on authors' computations.

Figure 1c: Time-Profile of the Krtscha Index of Inequality in the Distribution of Consumption Expenditure: Rural India 1983 to 2009–10



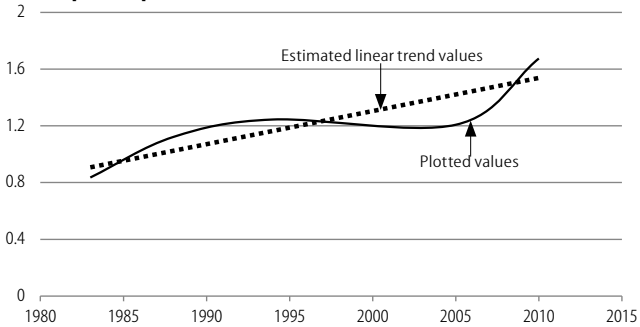
Source: Based on authors' computations.

Figure 1d: Time-Profile of the Standard Deviation in the Distribution of Consumption Expenditure: Urban India 1983 to 2009–10



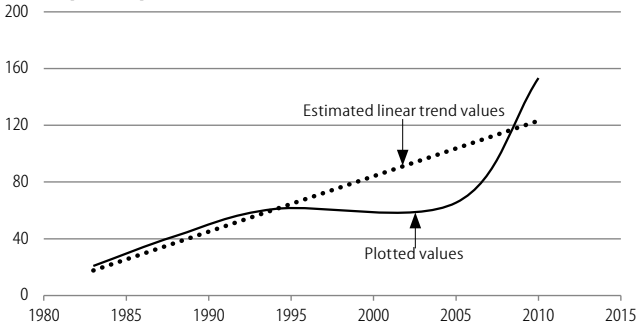
Source: Based on authors' computations.

Figure 1e: Time-Profile of the Coefficient of Variation in the Distribution of Consumption Expenditure: Urban India 1983 to 2009–10



Source: Based on authors' computations.

Figure 1f: Time-Profile of Krtscha Index of Inequality in the Distribution of Consumption Expenditure: Urban India 1983 to 2009–10



Source: Based on authors' computations.

years in which the CSO's NSSO carried out its quinquennial surveys on consumption spending. For reasons that have been discussed at length in Section 2, we drop the year 1999–2000 (corresponding to the NSSO's 55th round) from our data set: our time-series therefore covers five points in time—1983, 1987–88, 1993–94, 2004–05 and 2009–10. We have employed unit-level data on the distribution of consumption expenditure available on CD-ROMs, separately for the rural and the urban areas of the country, and for each of the years mentioned. Households are ranked by per capita consumption expenditure, and the average expenditure for each household is attributed to each member of the household. We estimate inequality according to three measures: the standard deviation (*SD*), which is an absolute measure; the coefficient of variation (*CV*), which is a relative measure; and the Krtscha measure (*K*), which is an intermediate measure and is given by the product of *CV* and *SD*. It is just as well that we employ unit-level data for our computations: the *CV*, the *SD* and the *K* measures, we find, suffer from severe understatement when they are estimated from grouped data under the assumption that within any size-class of consumption expenditure the latter is distributed equally, at the level of the size-class's mean. Table 3 summarises the information on

Table 3: Inequality Measures for the Distribution of Consumption Expenditure in Rural and Urban India: 1983 to 2009–10 (with 1999–2000 Omitted)

Year	Rural India			Urban India		
	Standard Deviation	Coefficient of Variation	The Krtscha Measure	Standard Deviation	Coefficient of Variation	The Krtscha Measure
1983	22.39	1.053	23.58	24.87	0.835	20.76
1987–88	23.72	0.978	23.20	37.42	1.121	41.93
1993–94	23.18	0.945	21.90	48.98	1.244	60.95
2004–05	29.77	1.053	31.36	54.17	1.207	65.40
2009–10	41.84	1.337	55.95	91.59	1.674	153.31

Absolute and intermediate inequality measures are presented in constant (1960–61) rupees. The price deflators employed have been the CPIAL for rural India and the CPIIW for urban India.
Source: Unit level data available on CD-ROMs in text format. Labels on the CD-ROMs that have been used to extract unit level data, for the various NSS rounds for which we have performed the analysis, are: NSS, 38th round, Sch 1.0: Consumer Expenditure; NSS, 43rd Round, Sch 1.0: Consumer Expenditure, CC/NSS/6583; NSS, 50th Round Sch 1.0: Consumer Expenditure, CC/CD/3010; NSS, 61st Round, Sch 1.0: Consumer Expenditure; and NSS, 66th Round Sch 1.0: Consumer Expenditure (Uniform and Mixed Reference), CC/NSS/6784, 66, 1.0.

inequality for each of the rural and urban areas of the country. Table 4 presents the results of a linear regression of inequality on time, for each of the measures considered and for each of the rural and urban areas. Figures 1a to 1f (p 43)plot the time-profile of each of our inequality measures, separately for the rural and urban areas.

Table 4: Results of Linear Regressions of Inequality on Time (with 1999–2000 Omitted)

Dependent Variable (Measure of Inequality)	Intercept Coefficient	Slope Coefficient	R^2
Rural India			
Standard deviation	-1239.707	0.63521** (3.216)	0.775
Coefficient of variation	-17.535	0.00932[a] (1.617)	0.466
Krtscha	-2025.381	1.03035* (2.438)	0.665
Urban India			
Standard deviation	-4022.764	2.04117** (4.077)	0.847
Coefficient of variation	-45.336	0.02332** (3.137)	0.766
Krtscha	-7728.046	3.90607** (3.130)	0.766

** Indicates that the coefficient is significant at the 95% level; a indicates that the coefficient is significant at the 80% level; and * Indicates that the coefficient is significant at the 90% level.
Source: Data for regressions are from Table 3.

The tables and figures largely speak for themselves. In rural India, we do not have a statistically significant increasing trend in the relative measure (*CV*) of inequality, though this obtains for urban India. Given the dominant weight of the rural population in overall population, the combined (rural-cum-urban) picture is likely to lean on the side of the rural picture. The slope coefficient on the absolute measure of inequality (*SD*) is comfortably and significantly positive in both rural and urban India. Indeed, even the intermediate (Krtscha) index turns out to display a statistically significant increasing trend (at the 90% level in the rural areas and the 95% level in the urban areas). Briefly, even if we abjure the use of a measure of inequality such as the standard deviation which is "leftist" in the presence of income-growth, and settle for a "centrist" measure such the Krtscha index, we must conclude—*pace* the Ahluwalia–Bhalla inference based on the behaviour of a wholly "rightist" measure—that inequality in the distribution of consumption expenditure in India has increased over the period 1983 to 2009–10.

Finally, and largely for completeness of record, we consider the effect of "adjusting" the NSS means by scaling them up to bring them in line with the NAS means. To this end, we examine the trends in inequality for the entire (six-point) data series, first without resort to "adjustment," and then with resort to adjustment. The results of this exercise are presented in Tables 5a and 5b, respectively. The corresponding results on linear regressions of inequality on time are presented in Tables 6a and 6b (p 45), respectively. It should be noted that adjustment has consisted in scaling up the NSS means by the corresponding ratios of the NAS means to the NSS means: these ratios, for the years 1983 to 2004–05 have simply been borrowed from Table 4 of Bhalla (2011), while for 2009–10, the NSS mean consumption expenditure at the all-India level has been estimated as the population share weighted sum of rural and urban means in current prices, the NAS mean has been estimated employing the total private final consumption expenditure figure of Rs 37,95,901 crore as provided in Government of India (2011), and the estimated population figures are as provided in Table 1.

The effect of the likely understatement of inequality in the 55th round (1999–2000) on the overall trend over the period 1983 to 2009–10 is clearly discernible from the figures in Table 6a: none of the three measures of inequality employed, relative, absolute or intermediate, displays a statistically significant rising trend at even the 90% level. The picture, of course, is unaltered for the relative inequality measure when the NSS means are adjusted; however, for the mean-dependent absolute and intermediate inequality measures, there is a clear change in the significance of the slope coefficient: even the intermediate (Krtscha) measure displays a statistically significant rising trend (at the 90% level in rural India, and at the 95% level in urban India).

We are aware that the adjustment resorted to has entailed some rather dreadful hybrid procedures of marrying NSS

Table 5a: Inequality Measures in the Distribution of Consumption Expenditure for Rural and Urban India (Unadjusted for Possible Underestimation of NSSO Means): 1983 to 2009–10

Year	Rural India			Urban India		
	Standard Deviation	Coefficient of Variation	Krtscha	Standard Deviation	Coefficient of Variation	Krtscha
1983	22.39	1.053	23.58	24.87	0.835	20.76
1987–88	23.72	0.978	23.2	37.42	1.121	41.93
1993–94	23.18	0.945	21.9	48.98	1.244	60.95
1999–2000	17.46	0.644	11.25	70.44	1.591	112.07
2004–05	29.77	1.053	31.36	54.17	1.207	65.4
2009–10	41.84	1.337	55.95	91.59	1.674	153.31

Absolute and intermediate inequality measures are presented in constant (1960-61) rupees. The price deflators employed have been the CPIAL for rural India and the CPIIW for urban India.
Source: Unit level data available on CD-ROMs in text format. Labels on the CD-ROMs that have been used to extract unit level data, for the various NSS rounds for which we have performed the analysis, are: NSS, 38th Round, Sch 1.0: Consumer Expenditure; NSS, 43rd Round, Sch 1.0: Consumer Expenditure, CC/NSS/6583; NSS, 50th Round Sch 1.0: Consumer Expenditure, CC/CD/3010; NSS, 55th Round Sch 1.0: Consumer Expenditure; NSS, 61st Round, Sch 1.0: Consumer Expenditure; and NSS, 66th Round Sch 1.0: Consumer Expenditure (Uniform and Mixed Reference), CC/NSS/6784, 66, 1.0.

Table 5b: Inequality Measures in the Distribution of Consumption Expenditure for Rural and Urban India (Adjusted for Possible Underestimation of NSS Means): 1983 to 2009–10

Year	Rural India			Urban India		
	Standard Deviation	Coefficient of Variation	Krtscha	Standard Deviation	Coefficient of Variation	Krtscha
1983	27.74	1.053	29.22	30.82	0.835	25.72
1987–88	30.50	0.978	29.83	48.12	1.121	53.92
1993–94	37.51	0.945	35.43	79.25	1.244	98.62
1999–2000	31.46	0.644	20.27	126.92	1.591	201.93
2004–05	60.14	1.053	63.35	109.43	1.207	132.12
2009–10	93.31	1.337	124.78	204.27	1.674	341.91

(1) The ratio of NAS mean consumption to NSS mean consumption expenditure has been employed to adjust the inequality measures. (2) For the year 2009-10, the NSS mean consumption expenditure for all-India has been estimated as the population share weighted sum of rural and urban means in current prices. The NAS mean has been estimated employing the total private final consumption expenditure figure at Rs 3,795,901 crore as provided in Government of India (2011) and the estimated population figures as provided in Table 1.
Source: Data on NSS and NAS mean consumption expenditure: (1) for the first five years (1983 to 2004-05) are from Bhalla (2011, Table 4). (2) For the year 2009-10 "Press Note: Quick Estimates of National Income, Consumption Expenditure, Saving and Capital Formation, 2009-10", available at: http://mospi.nic.in/Mospi_New/upload/nad_press_release_31jan11.pdf.

and NAS estimates of mean consumption. We do not advocate resort to such adjustment. But the exercise is instructive to the extent that it reveals how the inclusion of the dubious 55th Round in the data series can affect one's entire reading of the trend in consumption inequality in the country. The exercise also assists in exposing a small irony. The demand for resort to adjustment has generally arisen in those quarters that have employed the adjustment to project diminished headcount poverty rates. However, the warrant for adjustment in the cause of computing *poverty* rates is dubious, since the underestimation (if any) of NSS means vis-à-vis NAS means is largely at the upper end of the consumption expenditure distribution, and therefore irrelevant for poverty estimation. On the other hand, for mean-dependent inequality measures, adjustment *does* make a difference—as Tables 6a and 6b clearly reveal. The "small irony" referred to earlier is just this: for those who insist on adjustment, the case for resorting to it is weak when it comes to estimating poverty, and strong when it comes to estimating inequality. Adjustment is an unsuitable response to high poverty rates, and also poorly serves the cause of low and non-increasing levels of (mean-dependent) inequality.

Table 6a: Results of Linear Regressions of Inequality on Time (Unadjusted for Possible Underestimation of NSS Means)

Dependent Variable (Measure of Inequality)	Intercept Coefficient	Slope Coefficient	R^2
Rural India			
Standard deviation	-1074.550	0.55139[a] (1.777)	0.441
Coefficient of variation	-11.726	0.00637[b] (0.613)	0.086
Krtscha	-1725.609	0.87820[c] (1.477)	0.353
Urban India			
Standard deviation	-4158.136	2.10987*** (4.411)	0.830
Coefficient of variation	-48.842	0.02510** (2.981)	0.690
Krtscha	-8076.469	4.08291** (3.402)	0.743

** Indicates that the coefficient is significant at the 95% level; [a] Indicates that the coefficient is significant at the 85% level; [b] Indicates that the coefficient is significant at the 43% level; [c] Indicates that the coefficient is significant at the 79% level; and
*** Indicates that the coefficient is significant at the 99% level.
Source: Data for regressions are from Table 5a.

Table 6b: Results of Linear Regressions of Inequality on Time (Adjusted for Possible Underestimation of NSS Means)

Dependent Variable (Measure of Inequality)	Constant	Slope Coefficient	R^2
Rural India			
Standard deviation	-4143.548	2.09866** (3.096)	0.706
Coefficient of variation	-11.726	0.00637[a] (0.613)	0.086
Krtscha	-5655.052	2.85753* (2.251)	0.559
Urban India			
Standard deviation	-11293.327	5.70608*** (5.323)	0.876
Coefficient of variation	-48.842	0.02510** (2.981)	0.690
Krtscha	-19740.114	9.95784** (3.795)	0.783

** Indicates that the coefficient is significant at the 95% level; [a] Indicates that the coefficient is significant at the 43% level; * Indicates that the coefficient is significant at the 90% level; and *** Indicates that the coefficient is significant at the 99% level.
Source: Data for regressions are from Table 5b.

5 Caste and Inequality

An elementary binary classification of the population along lines of caste yields two groups: the Scheduled Castes and Scheduled Tribes (SC–ST) and the rest, or "Others."

Table 7a presents information on caste-wise inequality levels for each of three indices: the coefficient of variation, the standard deviation, and the Krtscha measure, for both the initial (1983) and terminal (2009–10) years of our time-series, and for each of the rural and urban areas of the country. For each of the initial and terminal years, Tables 7b and 7c furnish a decomposition of the Krtscha measure along the lines described in Section 2. The following rather straightforward findings emerge from a consideration of the figures in Tables 7a–7c.

Table 7a: Inequality by Caste Groups: 1983 and 2009–10

Caste Group	Standard Deviation	Coefficient of Variation	Krtscha	Per Capita Consumption Expenditure (in 1983 Prices)	Population Share	Income Share	Income Share/ Population Share
Rural 1983							
SC–ST	60.21	0.6629	39.91	90.82	0.282	0.231	0.819
Others	132.12	1.1083	146.43	119.21	0.718	0.769	1.07
All	117.10	1.0532	123.33	111.19	1.000	1.000	
Urban 1983							
SC–ST	87.04	0.6768	58.91	128.60	0.148	0.117	0.791
Others	142.03	0.8406	119.39	168.97	0.852	0.883	1.04
All	136.05	0.8348	113.58	162.98	1.000	1.000	
Rural 2010							
SC–ST	88.78	0.6438	57.16	137.89	0.330	0.278	0.842
Others	259.09	1.4692	380.67	176.35	0.670	0.722	1.08
All	218.82	1.3373	292.62	163.63	1.000	1.000	
Urban 2010							
SC–ST	188.07	0.8389	157.76	224.20	0.185	0.139	0.751
Others	546.28	1.7268	943.31	316.36	0.815	0.861	1.06
All	500.97	1.6739	838.60	299.28	1.000	1.000	

Mean-dependent inequality indices are presented in constant (1983) prices, employing the consumer price index of agricultural labourers for the rural areas and the consumer price index of industrial workers for the urban areas.
Source: Computed employing unit level data, from Schedule 1.0 on consumption expenditure, available on CD-ROM, for the NSS 38th, and 66th rounds.

Table 7b: A Decomposition of the Krtscha Index: Rural India, 1983 and 2009–10

	1983	2010
Krtscha within-group component for SC–ST	39.91	57.16
Krtscha within-group component for others	146.43	380.67
Krtscha within-group component	121.82	290.73
Krtscha between-group component	1.51	1.89
Overall Krtscha	123.33	292.62
Proportionate within-group contribution (%)	98.78%	99.35%
Proportionate between-group contribution (%)	1.22%	0.65%

Source: Authors' computations based on figures in Table 7a.

Table 7c: A Decomposition of the Krtscha Index: Urban India, 1983 and 2009–10

	1983	2010
Krtscha within-group component for SC–ST	58.91	157.76
Krtscha within-group component for others	119.39	943.31
Krtscha within-group component	112.31	834.12
Krtscha between-group component	1.27	4.48
Overall Krtscha	113.58	838.60
Proportionate within-group contribution (%)	98.73%	99.47%
Proportionate between-group contribution (%)	1.27%	0.53%

Source: Authors' computations based on figures in Table 7a.

A very simple indicator of relative group disadvantage is yielded by the ratio of the income share to the population share for any group: "equality" would correspond to a ratio of unity; and relative disadvantage (respectively, advantage) would correspond to a ratio of less (respectively, greater) than unity. From Table 7a we notice that—unsurprisingly—the SCST group is relatively disadvantaged, and the Others group is advantaged, in each of the years 1983 and 2009–10, and in both the rural and the urban areas of the country. Furthermore, while the income-share-to-population-share ratio improves, from 1983 to 2009–10, for both groups in the rural areas, it actually deteriorates for the SCST group and improves for the Others group in urban India. It is surely hard to discover any sign of caste group-inclusiveness of growth in these figures.

Tables 7b and 7c suggest the following findings from a decomposition of the Krtscha index. In both the rural and the urban areas, (a) the within-group component for the SCST group has increased; (b) the within-group component for the Others group has increased; (c) the (aggregate) within-group component has increased; (d) the between-group component has increased; (e) overall inequality has increased; and (f) the *proportionate* between-group component is very small and has actually *declined*, indicating that while both within-group inequality and between-group inequality have increased, the former has done so at a faster rate than the latter. For those members of the "Forward Class" groups who profess a deep concern for the within-group inequality of the "Backward Class" groups—as manifested in their opposition to the alleged cornering of the benefits of caste-based reservation in education and employment by the so-called "creamy layer" in the Backward Classes—it should be interesting to note that it is the within-group component of the non-SCST group which accounts for a massive part of overall inequality in the distribution of consumption expenditure in India.

6 Concluding Observations

In this paper, we have reviewed the trend of inequality in the distribution of consumption expenditure in India over the last quarter-century. Our study suggests that if we correct for data deficiencies and adopt a somewhat plural approach to the measurement of inequality, going beyond a wholly relativistic conceptualisation of the phenomenon, then the outcome of statistical analysis coincides with the commonly encountered perception that India, in recent years, has indeed been a country of widening economic inequality, with little evidence of either interpersonal or inter-caste inclusiveness in growth. We have also, in this paper, argued the case for a routine incorporation of unit-consistent absolute and intermediate inequality measures, with specific reference to the Krtscha measure, in applied distributional analysis. It is our hope that the paper will have been of some use, for those working on distributional issues, from the points of view of both conceptual and empirical relevance.

NOTES

1 A non-exhaustive list of important works dealing with mean-dependent inequality measures would include—among others—Atkinson and Brandolini (2004), Azpitarte and Alonso-Villar (2011), Bosmans, Decancq and Decoster (2011), Bossert and Pfingsten (1990), Chakravarty and Tyagarupananda (1998, 2009), Del Rio and Alonso-Villar (2008, 2011), Del Rio and Ruiz-Castillo (2000, 2001), Jenkins and Jantti (2005), Kolm (1976a, 1976b), Krtscha (1994), Moyes (1987), Yoshida (2005), Zheng (2007), and Zoli (2012).

2 For important applied work whose theoretical basis is also clearly spelt out, the reader is referred to Atkinson and Brandolini (2004) and Bosmans, Decancq and Decoster (2011) who deal with inequality in the global distribution of income, and to Del Rio and Ruiz-Castillo (2000, 2001) who deal with the Spanish distribution of income.

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Consumption Expenditure:

(1) *Grouped Data*

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— (2011): *Level and Pattern of Consumer Expenditure, 2009–2010*, NSS 66th Round (July 2009–June 2010), Report No 538, Government of India.

(2) *Unit Level Data*

Unit level data are available in text format in CD-ROMs. Labels on the CD-ROMs that have been used to extract unit level data, for the various NSS rounds for which we have performed the analysis, are provided below:

NSS, 38th Round, Sch 1.0: Consumer Expenditure.

NSS, 43rd Round, Sch 1.0: Consumer Expenditure, CC/NSS/6583.

NSS, 50th Round Sch 1.0: Consumer Expenditure, CC/CD/3010.

NSS, 55th Round Sch 1.0: Consumer Expenditure.

NSS, 61st Round, Sch 1.0: Consumer Expenditure.

NSS, 66th Round Sch 1.0: Consumer Expenditure (Uniform and Mixed Reference), CC/NSS/6784, 66, 1.0.

Consumer Price Index (General) For:

(1) *Agricultural Labour (CPIAL)*

Data for the years 1983–84, 1987–88, and 1993–94 are from:

http://labourbureau.nic.in/CPI%2004-05%20Table%201.htm, accessed on 15 February 2012.

Data for the years 1999–2000 and 2004–05 are from:

http://labourbureau.nic.in/CPI%2004-05%20Table%202.01.htm, accessed on 20 February 2012.

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http://www.indiastat.com/table/economy/8/agriculturallabourers/14432/287502/data.aspx, accessed on 20 February 2012.

(2) *Industrial Workers (CPIIW)*

Data for the period 1983–84 to 2004–05 are from:

http://www.rbi.org.in/scripts/publicationsView.aspx?id=8248, accessed on 2 May 2012.

Data for the year 2009–10 are from:

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Census of India, 2001, Series 1: Final Population Totals, Registrar General and Census Commissioner, India.

Census of India, 2011, Provisional Population Totals, Paper 2, Volume 1 of 2011, Rural-Urban Distribution, India-Series 1, available at: http://www.censusindia.gov.in/2011-prov-results/paper2/prov_results_paper2_india.htm, accessed on 1 May 2012.

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