

## POVERTY IN INDIA 1951-1994: TRENDS AND DECOMPOSITIONS

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Revised August 1997

### Abstract

We construct a new time series of poverty measures for both rural and urban India from 1951 to 1994. The results show that there was little progress in reducing poverty until the mid-1970s, and that there has been a marked downward trend since then. It took nearly 30 years for India's poverty measures to fall appreciably below their levels in the early 1950s. Measures of the depth and severity of poverty show a more marked decline over the period than does the headcount index. More than three-fourths of the decline in national poverty measures is attributable to the decline in rural poverty. Both growth in mean consumption and redistribution contributed to the decline in national poverty.

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## 1 Introduction

Ahluwalia (1978) provided what has been probably the best-known time series on poverty measures for India to date. While it was influential in inducing a number of empirical studies in the late 1970s and the 1980s,<sup>1</sup> that series can now be improved upon, for several reasons. First (and most obviously), the Ahluwalia series, which covered the period 1956-57 to 1973-74, is now rather dated. Ahluwalia (1985) later augmented the series to include the 32nd round of the National Sample Survey (NSS) for 1977-78. However, consumption distributions for nine subsequent NSS rounds for the 1980s and early 1990s have since become available. While the data from some of the later rounds have been used by researchers to examine poverty issues for the 1970s and 1980s,<sup>2</sup> there does not exist a consistent time series going back to the 1950s. Second, the Ahluwalia series pertained to rural India only. With the urbanization of the Indian economy, the omission of the urban sector in poverty series for India has become increasingly hard to ignore. Third, advances, since the Ahluwalia series, in both the theory of poverty measurement (including the introduction of new poverty measures), and the methodology for estimating poverty measures from grouped data (the main form in which the primary distributional data are available for India), also make the construction of a consistent poverty series over the entire period a worthwhile project.

Thus, a key objective of this paper is to construct and present such a time series of poverty measures for rural and urban India over the period 1951 to 1994. To our knowledge, this is the longest available time series on poverty measures for India, and, perhaps, the longest series of its kind anywhere in the world.

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<sup>1</sup> Including Griffin and Ghose (1979), Saith (1981), Ahluwalia (1985), Desai (1985), and other papers in the collection edited by Mellor and Desai (1985), van de Walle (1985), Gaiha (1989).

<sup>2</sup> See, for example, Kakwani and Subbarao (1990, 1993), Ravallion and Subbarao (1992), Bhattacharya et. al. (1991), Minhas, Jain and Tendulkar (1991), Nayyar (1991), Datt and Ravallion (1993), Tendulkar, Sundaram and Jain (1993).

The paper is largely descriptive in nature. Its main purpose is to present the new time series, and highlight some stylized facts of the evolution of poverty and inequality in the country over the last four decades. While addressing this broad objective, the paper also seeks to address several specific questions including the following. Has there been a significant decline in poverty in the post-independence period? What has been the extent and time pattern of the observed decline in poverty? Is rural poverty higher than urban poverty? Is there a trend towards urbanization of poverty in India and/or convergence of the rural-urban poverty rates? What have been contributions of intra-sectoral changes in poverty and inter-sectoral population shifts to changes in national poverty? What have been the relative contributions of growth and redistribution factors in the evolution of poverty? Does the choice of the poverty measure influence the answers to the above questions?

The paper is organized as follows. The following section discusses in detail the underlying data and our methodology. Section 3 presents the poverty series and discusses the principal findings. In section 4, we look at the proximate sources of change in poverty over this period using some simple decompositions. Our concluding observations are summarized in section 5.

## 2 Methodology and data

### 2.1 The Poverty Measures

We will be concerned with measuring "absolute poverty", by which we mean that the poverty line is fixed in terms of the standard of living it commands over the entire domain of poverty measurement (in our case, the entire period 1951-94 and across both sectors). The absolute poverty series is thus *consistent* over time and between sectors in that the extent of a household's poverty depends solely on its standard of living. Following the now well-established practice for India and elsewhere, the individual standard of living is measured by real per capita consumption expenditure of the household to which it belongs.<sup>3</sup> Three poverty measures are used in this paper:

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<sup>3</sup> This is true of most of the literature on poverty in India, reflecting mostly the fact that the primary source of

i) The headcount index (H), given by the percentage of the population belonging to households with consumption per capita below the poverty line. This is a straightforward measure of the *incidence* of poverty and has the advantage of being easy to interpret, but it tells us nothing about the depth or severity of poverty.

ii) The poverty gap index (PG), defined by the mean distance below the poverty line expressed as a proportion of that line (where the mean is formed over the entire population, and the non-poor are counted as having zero poverty gaps). This index is interpretable as a measure of the *depth* of poverty as it depends on both the incidence of poverty as well as the average poverty deficit of the poor.

iii) The squared poverty gap index (SPG), defined as the mean of the *squared* proportionate poverty gaps (the proportionate poverty gaps are measured as for the PG index). Unlike the headcount and poverty gap indices, this measure is sensitive to distribution amongst the poor. A transfer of income from a poor person to a poorer person (for example) will decrease SPG, even as it has no effect on either H or PG. The SPG index is thus interpretable as a measure of the *severity* of poverty. Also, unlike other distribution sensitive measures of poverty, such as those proposed by Sen (1976) and Kakwani (1980), the SPG measure satisfies the "sub-group consistency" property, *viz.*, that if poverty increases in any sub-group (say the urban

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distributional data, namely the National Sample Survey, has information on household expenditures only. Some data on distribution of income are available from surveys conducted by the National Council of Applied Economic Research (NCAER). But the NCAER surveys use a much smaller sample frame and have been conducted very infrequently. For instance, only four such surveys were conducted over the three decades from the 1960s through the 1980s. On the other hand, very few of the NSS rounds have included information on utilization of public services, which is (arguably) an important variable that will not be captured well by an NSS consumption expenditure-based welfare measure.

sector) and it does not decrease elsewhere, then aggregate poverty must also increase (Foster and Shorrocks, 1991).

All three poverty measures are members of the Foster-Greer-Thorbecke (FGT) class of poverty

$$P_{\alpha} = \int_0^z \left[ \frac{z-x}{z} \right]^{\alpha} f(x) dx \quad \alpha \geq 0$$

measures (Foster, Greer and Thorbecke 1984), and defined generically as:

where  $x$  is per capita consumption expenditure,  $f(x)$  is its density (roughly the proportion of the population consuming  $x$ ),  $z$  denotes the poverty line, and  $\alpha$  is a non-negative parameter. Higher values of the parameter  $\alpha$  indicate greater sensitivity of the poverty measure to the distribution below the poverty line. The poverty measure H is obtained for  $\alpha=0$ , PG is obtained for  $\alpha=1$ , and SPG for  $\alpha=2$ .

The poverty measures are calculated using parameterized Lorenz curves. We use two alternative parametric models of the Lorenz curve: the general quadratic model (Villasenor and Arnold 1989) and the Beta model (Kakwani 1980). After checking that the estimated models satisfy the theoretical conditions needed for a valid Lorenz curve, poverty measures are derived using the (valid) specification which fits gives a better fit of the Lorenz curve up to the headcount index. (The Gini indices on the other hand are derived using the specification which gives a better fit over the entire distribution.) For further details on poverty measurement using parameterized Lorenz curves and the formulae used in the calculation of poverty measures, see Datt (1992) and Datt and Ravallion (1992).<sup>4</sup>

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<sup>4</sup> This technique of poverty measurement has been set-up in a user-friendly computer program "POVCAL" (Chen, Datt and Ravallion, 1991) which is available on request from the authors. The interested readers can readily check our calculations and their sensitivity to our assumptions.



## 2.2 The Poverty Line

The poverty line we use is the Planning Commission line originally defined by the Task Force on Projections of Minimum Needs and Effective Consumption Demand (Government of India, 1979), and recently endorsed by the Expert Group on Estimation of Number and Proportion of Poor (Government of India, 1993). This poverty line has been widely used in recent work on poverty in India, including Minhas, Kansal and Jain (1992), Kakwani and Subbarao (1993), Tendulkar, Sundaram and Jain (1993), Gupta (1995), Tendulkar and Jain (1995). The poverty line is based on a norm of a daily per capita intake of 2400 calories in rural areas and 2100 calories for urban areas. The rural and urban lines were defined by the levels of average per capita expenditure at which the caloric norms were typically attained in the two sectors, thus following what has been termed as the food energy method (Ravallion 1994). Following this methodology, the Planning Commission determined the rural poverty line at a per capita monthly expenditure of Rs. 49, and the urban line at Rs. 57 (rounded to the nearest rupee) at 1973-74 all-India prices.

Since food shares typically decline with higher levels of living, the food energy method need not yield consistent sectoral poverty lines implying a uniform threshold in terms of the living standard indicator; the inconsistency is more serious if the average levels of living vary significantly across sectors (Ravallion 1994). We can, however, assess if this is a serious concern by comparing independent estimates of the urban-rural cost of living differential with that implicit in the Planning Commission poverty lines. One such estimate for 1973-74 is available from Bhattacharya et. al. (1980) who used the NSS 28<sup>th</sup> round data to estimate the following all-India urban-to-rural cost of living indices: a Laspeyer's index of 116.50, a Paasche' index of 115.22, and a Fisher's index of 115.86. This estimate of an approximate 16 per cent differential in urban and rural prices coincides almost exactly with the differential implicit in the Planning Commission poverty lines of Rs. 57 and Rs. 49 for the two sectors. Thus, the use of the food energy method does not appear to have introduced any evident bias in the sectoral poverty lines, and we use these poverty lines throughout the rest of our analysis.<sup>5</sup>

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<sup>5</sup> This poverty line of Rs. 49 per capita per month at October 1973-June 1974 all-India rural prices is about 11%

### 2.3 NSS Distributions of Consumption Expenditure: Coverage and Comparability

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higher in real terms than the other widely-used poverty line of Rs. 15 per capita per month at 1960-61 all-India rural prices, due to Dandekar and Rath (1971).

The poverty measures are based on the available National Sample Survey (NSS) data on the size distribution of consumption expenditure. All our data are collated from published reports for various rounds of the NSS. We use all the NSS rounds, to date, for which rural and urban consumption distributions are available, beginning with the 3rd round<sup>6</sup> for August to November 1951 and going up to the latest 50th round for July 1993-June 1994. Altogether, we make use of 35 rounds of the NSS. The survey periods for these rounds are of varying length ranging from 4 to 14 months, though 20 of them cover a period of 12 months each. The 35 surveys together cover a period of 349 months (29.1 years) out of a total of 515 months (42.9 years) between August 1951 and June 1994, which amounts to 67.8% of the total time-span. A distinguishing feature of our series is that we have made a special attempt to draw upon some of the early rounds of the NSS, notably those for the early 1950s, which have been hitherto neglected in the assessments of poverty in India. Table 1 lists all the NSS rounds covered by this study, their survey periods, sample sizes and the published sources.

The NSS consumption surveys have followed a broadly uniform questionnaire and survey methodology over this long 40 year period (Government of India, 1990; Bhattacharya, Coondoo, Maiti and Mukherjee, 1991). On the particular issue of the number of items included in the consumption module, for instance, we compared the coverage of items in the 9th round for 1955 and the 48th round for 1992. The comparison revealed very little change in the coverage of items under the food, fuel and light, clothing and footwear groups. The coverage of the remaining non-food items was however more detailed in the 48th round. But, the former group of items accounts for a very large share of total expenditure, particularly for poor households. In 1992, the average share of this group of items was over 70% of total consumption expenditure for the urban sector and over 80% for the rural sector as a whole (GOI, 1994); the corresponding shares for the poor would be significantly higher still. The extent of changes in the coverage of consumption

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<sup>6</sup> The first two rounds of the NSS covered rural areas only.

items in the NSS surveys thus does not appear to be a serious concern for consistent poverty measurement over time.

There are however other issues of comparability, some relating to specific NSS rounds. These issues and how we have sought to address them are discussed below.

i) The 3<sup>rd</sup> and the 6<sup>th</sup> rounds of the NSS used a weekly recall of consumption while all other rounds used the "last month" as the reference period. There is evidence from NSS rounds 4 and 5, which used both weekly and monthly recalls, that the former tends to yield higher estimates of consumption. We thus made a downward adjustment to the rural and urban mean per capita monthly expenditures for NSS rounds 3 and 6, using the average ratio of weekly-recall means to monthly-recall means for NSS rounds 4 and 5. This is done separately for rural and urban means.<sup>7</sup>

ii) A further comparability issue relates to the valuation of the consumption of home-produced items. These were valued at local retail prices up to the 8<sup>th</sup> round, but at ex-farm or ex-factory prices thereafter. We addressed this problem as follows. The 3<sup>rd</sup> and 4<sup>th</sup> NSS rounds provide information on the share of the imputed-value component in total consumption for rural and urban areas. Averaged over the two rounds this share was 43.7 percent for rural areas and 10.8 percent for urban areas. Since similar information for rounds 5 through 8 is not available, we assume that the imputed-value component accounts for the same proportion of total expenditure in these rounds as the average for rounds 3 and 4. Retail prices in the early 1950s were estimated to be about 10-20 percent higher than wholesale prices (Krishnaji, 1971). We thus use a point estimate of 15 percent differential between the imputed prices up to the 8<sup>th</sup> round and those for subsequent rounds. The rural and urban mean expenditures for rounds 3 through 8 were then adjusted as follows:

$$\text{Adjusted mean} = \text{unadjusted mean} - (0.15/1.15) \times [\text{share of imputed component} \times \text{unadjusted mean}]$$

Of course, an adjustment to the mean may not be enough, since the Lorenz curve will also be affected if the share of the imputed component varies across expenditure groups. The earliest information on this issue is

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<sup>7</sup> We made no adjustment to the Lorenz curves for these rounds, mainly because it is not clear from the available evidence how different reference periods influence the Lorenz curve.

available for 1964-65 from the 19<sup>th</sup> round of the NSS, which is summarized in Table 2. This information is limited to consumption of home-grown *foodgrains*, but foodgrains are likely to account for most of the imputed-value component of total consumption. The data in Table 2 indicate that consumption out of home-grown foodgrains is quantitatively unimportant for the urban sector. For the rural sector, the share of home-grown foodgrains in total consumption is found to be quite flat over a wide range of the distribution, from about the 25<sup>th</sup> to the 95<sup>th</sup> percentile of the population; it is somewhat lower for the poorest 25 per cent. This suggests our procedure of limiting the adjustment to only the mean of the distribution is not altogether unreasonable. In particular, the procedure could be expected to provide fairly accurate estimates of the headcount index although the other poverty measures may be subject to some over-estimation.

iii) There is also the data problem associated with the NSS 32nd round consumption distribution for 1977-78, first pointed out by Jain and Tendulkar (1989). They drew attention to the fact that the expenditure on durables for the top fractile group in the published distributions (GOI, 1986b; see Table 1) for this round was uncharacteristically high, especially in the rural sector. They favored an adjustment (their method III) which assumed that the share of durables in total expenditure for the top fractile group increased linearly between 1972-73 and 1983. A later report (GOI, 1991a; see Table 1), while comparing expenditure patterns over NSS rounds 27, 32, 38 and 43, alluded to mis-classification as a possible explanation, noting that "... in the 32nd round some of the items [may] have been taken out of 'miscellaneous goods and services' block and then included under the block of 'durable goods'." (p. 31). We constructed the concentration curves for the combined expenditure on durables and miscellaneous goods and services for 1977-78 and those for the immediately preceding and succeeding rounds (see Table A1 and Fig. A1 and A2). Our estimates indicated that the top fractile group (i.e. the top 1.74 per cent in rural areas and 2.03 per cent in urban areas, as these were the shares of population in the top expenditure bracket during 1977-78) accounted for the following percentages of the total expenditure on durables *and* miscellaneous goods and services during the three rounds: <sup>8</sup>

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<sup>8</sup> The shares for 1973-74 and 1983 are calculated from the estimated concentration curves for expenditure on

	1973-74	1977-78	1983
Rural	19.0	40.4	16.3
Urban	19.3	23.4	15.8

Even for the combined category, durables and miscellaneous goods and services, the share of the top fractile group in 1977-78 seems to be out of line with those for the other surveys (also see Fig. A1, A2). The share is particularly high for the rural sector. These estimates suggest that mis-classification of expenditure is not an adequate explanation for the recorded 1977-78 values of expenditure on durables by the top fractile group. In Annex A, we construct an alternative estimate of per capita expenditure on durables and miscellaneous goods and services by the top fractile group in 1977-78, implying a downward adjustment of these expenditures by 38.0 and 14.3 per cent in the rural and urban sectors respectively. These adjustments are based on the 1973-74 and 1983 concentration curves for this expenditure category; see Annex A for details.

Since these adjustments are limited to the top end of the distribution, they do not affect the poverty estimates for 1977-78; however, they do make a significant difference to the estimated inequality measures and to the decompositions of changes in poverty discussed later.

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durables and miscellaneous goods and services; see Annex A for details.

It is appropriate here to point out that while we have dealt with the above NSS data comparability issues, there remain others we have not been able to deal with. These include, in particular, issues arising out of the NSS conventions on (i) the valuation of "cooked meals" given to employees, which are included in the consumption of the employer household but not in the consumption of the recipient household, (ii) the valuation of market and auto-consumption at different prices, the former at retail prices and the latter at the usually lower ex-farm or ex-factory prices, and (iii) the non-inclusion of imputed rent for owner-occupied dwellings in measured household expenditure.<sup>9</sup> With increasing "commercialization" over the last four decades, all three factors could be expected to underestimate poverty rates for the earlier period *more than* those for the more recent period, hence contributing to a potential overestimation of the decline in poverty over time. This should be borne in mind while interpreting our results below on the evolution of poverty.

#### 2.4 Cost of living indices

The original NSS consumption distributions are of course at current prices. For consistent inter-temporal comparisons and aggregation across sectors, we need appropriate cost of living indices. The cost of living indices that we have used are described as follows.

The urban cost of living index we use is the all-India Consumer Price Index for Industrial Workers (CPIIW) for the period since August 1968. For the period before August 1968, we have used the Labour Bureau's Consumer Price Index for the Working Class, which is an earlier incarnation of the CPIIW albeit with a smaller coverage of urban centers (27 against 50). After appropriate adjustments for changes in the base period, we label the entire urban cost of living index series as CPIIW. The base of the series has been shifted to October 1973 - June 1974 to coincide with survey period of 28th round of the NSS.

The rural cost of living index series has been constructed in three parts.

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<sup>9</sup> See Government of India (1986, 1996). Also see Suryanarayana (1996) for related discussion on the NSS database for poverty estimates.

- (i) For the period since September 1964, our rural cost of living index is the Labour Bureau's all-India Consumer Price Index for Agricultural Labourers (CPIAL).
- (ii) For the period before September 1964, there does not exist an *all-India* CPIAL. The Labour Bureau series on the *all-India* CPIAL started only since September 1964 (*Indian Labour Journal*, November 1964), although state-level indices were being published several years prior to that as an interim series. The CPIAL indices for 10 major states over the period September 1956 - June 1960, and for 12 major states over the period July 1960 - August 1964, are thus available from various publications of the Labour Bureau.<sup>10</sup> Hence, for this earlier period, September 1956 through August 1964, we have constructed a monthly series of the all-India CPIAL as a weighted average of the state-level CPIALs, using the same state-level weights as those used in the all-India CPIAL published since September 1964.<sup>11</sup>
- (iii) We are still left with the problem of finding a suitable rural cost of living index for the initial period August 1951 - August 1956 (spanning NSS rounds 3 through 11). Our approach here has been to forecast the CPIAL using a dynamic model of the CPIAL as a function of the CPIIW and the Wholesale Price Index (WPI). The model is estimated using monthly data on these indices over the period September 1956 to September 1988. The details of the model and the forecasts are set out in Annex B.

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<sup>10</sup> In particular, from the February 1961 issue of the *Indian Labour Journal* and various issues of the *Indian Labour Yearbook*.

<sup>11</sup> The state-level weights for the all-India CPIAL can be found in a number of official publications, for example, in the *Monthly Abstract of Statistics* published by the Central Statistical Organisation.



Finally, we make a further adjustment to the CPIAL indices to deal with the peculiar treatment of firewood prices in the official CPIAL series. This has to do with the Labour Bureau having used a constant price of firewood in the construction of the CPIAL indices since 1960-61. Firewood has a non-trivial 6% weight in the CPIAL, and the Labour Bureau's practice has thus implied an underestimation of the rural rate of inflation, which is all the more significant as firewood prices have risen more rapidly relative to other commodities included in the CPIAL. We have thus re-worked the official CPIAL series incorporating into the series the actual inflation in firewood prices. In making this adjustment to the CPIAL series, we used data on the actual rural (all-India) retail firewood prices which are available on a monthly basis since August 1969 in the Central Statistical Organisation's journal *Monthly Abstract of Statistics*. For the period preceding August 1969, our adjustment is based on the assumption that firewood prices increased proportionately with the prices of other items in the Fuel and Light component of the CPIAL. Details of this adjustment are given in Annex C.<sup>12</sup>

The final CPIIW and CPIAL index numbers we use are averages of monthly indices corresponding to the exact survey period of each NSS round.<sup>13</sup> These indices, with the base set at the survey period of NSS 28th round (October 73-June 74), are shown in Table 3.

## 2.5 Population weights

National estimates of mean consumption and poverty measures are derived as population-weighted averages of the sectoral measures. Population weights are also need for aggregating sectoral Lorenz curves to derive estimates of national inequality measures. The rural and urban population weights for this purpose were constructed using Census data from the five censuses in the post-independence period. We assume that

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<sup>12</sup> The reader can get a sense of how much of a difference this adjustment makes from Table 3 where we present the real mean consumption series both with and without the correction for the price of firewood. The poverty series without the correction for firewood prices are available from the author upon request.

<sup>13</sup> We differ in this respect from Ahluwalia (1978) who used averages of the CPIAL over the agricultural year (July to June), even for NSS rounds where the survey period was not the agricultural year. Given the time trend and seasonality in prices, an exact matching of the survey period is arguably a better procedure.

sectoral populations grew at constant (compound) rates of growth between any two successive censuses. The inter-census growth rates were derived from the respective census population totals, and population estimates for any given NSS round were centered at the chronological mid-point of the survey period for that round.

This section has presented an admittedly brief description of the data and sources. Further details on the entire database for this research project can be found in Ozler, Datt and Ravallion (1996).

### 3 The Estimated Time Series

Our time series on different aspects of the evolution of consumption distributions in India during 1951-1994 are presented in Tables 3-5. The data are presented by NSS round (and by sector whenever appropriate). The series on real mean per capita consumption (at 1973-74 all-India rural prices), the Gini coefficients, and the cost of living indices are given in Table 3. Table 4 presents the consumption shares of deciles of population. Table 5 gives the three poverty measures (described in section 2.1) for rural and urban sectors and the country as a whole. The sectoral/national real mean per capita consumption and the Gini indices are graphed in Figures 1 and 2. The sectoral/national series on the three poverty measures are graphed in Figures 3(a), (b) and (c), while Figure 4 graphs an indices for the national poverty measures with base 1951/55=100.<sup>14</sup>

The detailed poverty statistics of Table 5 are further summarized in Table 6, where we have averaged estimates over NSS rounds spanning a 5-7 year interval.<sup>15</sup> The summary averages are intended to bring into sharper relief the overall pattern of changes over time which is otherwise clouded by (i) uneven spacing between NSS rounds, which range from back-to-back rounds to those separated by a 4.5 year interval, (ii)

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<sup>14</sup> In these graphs, the values for different NSS rounds are shown centered at the mid-point of the survey period for those rounds.

<sup>15</sup> These are weighted averages, where the weights are the length (number of months) of the survey periods of the NSS rounds included in the sub-period.

large round-to-round fluctuations in living standards, and (iii) potential seasonality effects for several NSS rounds which do not cover a full one-year period.

### 3.1 The evolution of inequality

Inequality can be measured in a number of different ways (Sen, 1996). To the extent we rely heavily on a single measure of inequality, namely the Gini index, the following discussion ought to be interpreted with some caution. Several points are nevertheless notable about the results on inequality presented in Tables 3-4 and Figures 1-2.

(i) Urban inequality as measured by the Gini index is consistently higher than rural inequality for all NSS rounds; the urban Gini indices are on average about 15% higher than the rural Gini indices. (ii)

The rural, urban and national Gini coefficients seem to follow a similar time pattern. For the period as a whole, there is a small but statistically significant unconditional trend decline in rural, urban and national Ginis, the annual trend rates of decline being 0.4, 0.29 and 0.32 percent respectively. The faster decline in rural inequality is also reflected in a significant trend increase in the ratio of urban to rural Ginis. Most of the decline in the Ginis seems to be concentrated during the late-1950s and mid-1960s; there is no significant trend decline beyond the mid-1960s.

(iii) The time pattern of inequality suggested by the Gini indices is consistent with other measures of changes in consumption distribution. For instance, the share of the bottom 40% of the national population in total consumption reveals a similar pattern of improvement up to the mid-1960s and little change thereafter (Table 4).

### 3.2 The evolution of poverty

Several notable features of the evolution of poverty in India emerge from the results presented in Tables 5-7 and Figures 3-4.

(i) In terms of the evolution of national poverty, the entire 4-decade period, 1951-1992, can be thought of as consisting of three sub-periods: *first*, the period up to the mid-1970s (rounds 3-28), which is characterized by fluctuations in poverty without a trend<sup>16</sup>; *second*, the period since mid-1970s up to about 1986-87 (rounds 32-42), during which we do observe a significant trend decline;<sup>17</sup> and *third*, the period since the late 1980s (rounds 43-48), when the decline in poverty levels off (see Fig. 1).<sup>18</sup> Thus, it took nearly three decades for the poverty measures to finally fall below - and stay below - their values at the beginning of the 1950s.

(ii) This characterization is appropriate at the sectoral level too. Changes in rural poverty closely follow those at the national level, which is not surprising given the large share of the rural population (about 74% even at the end of the period). It is somewhat more notable that a similar time pattern also holds for urban poverty, although the changes in urban poverty are less pronounced. Both the fluctuations over the first sub-period and the fall in poverty during the second sub-period are thus less marked for urban than rural areas.

(iii) The overall temporal profile of poverty is similar for all three poverty measures. The choice of the poverty measure does however matter in several point-to-point comparisons. For example, between 1960-61 and 1961-62, the headcount index of rural poverty increased, while the squared poverty gap decreased.

(iv) Even as it took nearly three decades coming, the reduction in poverty since the mid 1970s has been sizable. Just how sizable depends on the poverty measure used. Between 1951-55 and 1991-92, the national headcount index declined by 28 percent from about 53 to 38 percent (Table 6). The poverty gap and

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<sup>16</sup> The first sub-period is marked by three significant peaks in poverty around the years 1953-55 (rounds 7, 8), 1956-58 (rounds 11, 12, 13), and 1966-68 (rounds 21, 22), the last of these coinciding with the worst drought in the post-independence period.

<sup>17</sup> The absence of fluctuations in poverty over the period 1975-85 may be somewhat illusory as we have only two NSS surveys in the intervening period, *viz.* those for 1977-78 and 1983. In particular, we do not have poverty estimates for the two drought years 1979 and 1982.

<sup>18</sup> There was a sharp increase in rural poverty in 1992 (NSS 48th round). See section 3.3 below for further discussion of the poverty estimates for this year.

squared poverty gap indices declined even more rapidly, the former by 51 percent (from about 19 to 9.2 percent) and the latter by 64 percent (from over 8.9 to about 3.2 percent).

(v) Table 6 also shows that the decline in rural poverty has been more substantial than in urban poverty for all poverty measures. Rural H, PG, SPG declined by about 28, 52, and 66 percent as against urban declines of 22, 39, and 50 percent respectively.

(vi) With a rapidly growing population, the absolute number of the poor has nevertheless increased significantly - though not monotonically - since the beginning of the period, from about 199 million in 1951-55 to 323 million in 1991-92, implying an increase of 62 percent (Table 7).

(vii) Changes in poverty measures closely follow the movements in the real mean consumption per capita. The relationship with the Gini indices appears to be more noisy (see Tables 3 and 5, Fig. 5).<sup>19</sup> However, both matter significantly to the observed levels of poverty, as illustrated by the following regression

$$\ln(H_t / 1 - H_t) = 9.073 - 3.031 \ln(\text{mean consumption})_t + 0.955 \ln(\text{Gini})_t$$

(0.327) (0.044) (0.077)

for the national headcount index:

[n=34, R<sup>2</sup>= 0.987;  $\chi^2$  tests: AR(1)= 1.78, RESET(1)= 0.47, NORM(2)= 0.53, HETERO= 0.03; standard errors in parentheses below the estimated parameters].

### 3.3 The 1992 increase in poverty

By all poverty measures, there is a sharp increase in rural poverty in 1992. Compared with the preceding full-year survey for the 46th round (1990-91), H, PG and SPG indices increased by 19, 26 and 30

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<sup>19</sup> In another paper (Ravallion and Datt 1996), we look at the intra- and cross-sectoral effects of mean consumption on rural and urban poverty.

per cent respectively. For the urban sector, the estimates are indicative of virtually no change in poverty over the three NSS rounds covering the period July 1990 to December 1992. But given the large share of the rural sector in total population (about 74% in 1992), the increase in rural poverty in 1992 is strongly reflected in the change in national poverty. Compared with the levels in 1990-91, the national H, PG and SPG in 1992 were higher by 15, 20 and 23 per cent respectively. Most of the increase in rural poverty appears to be driven by a lower real mean consumption in 1992. There is some increase in the rural Gini between 1990-91 and 1992, but it is not substantial.

This increase in poverty in 1992 seems to reflect mostly the adverse circumstances of that year:

i) 1992 was a high inflation year. Between the 46th round (July 1990-June 1991) and the 48th round (January-December 1992), rural prices increased by 28 per cent (29 per cent using the uncorrected CPIAL).

ii) The year 1991-92 was also a poor agricultural year. The agricultural production index declined from 143.7 in 1990-91 to 137.6 in 1991-92 (triennium ending 1981-82 = 100), largely reflecting the decline in *kharif* foodgrain output from 99.4 million tons in 1990-91 to 91.6 million tons in 1991-92. There was also a decline in the yield per hectare of *kharif* foodgrains from 1231 to 1174 kgs. over the same period.

The higher inflation rate and the decline in agricultural production and yields during 1992 are consistent with the observed increase in rural poverty. Elsewhere, we have estimated a dynamic model of rural poverty in India using time series data for 1958-59 to 1989-90, which clearly identifies agricultural yields and the rate of inflation as two key determinants of rural poverty (see Ravallion and Datt, 1995).

### 3.4 Urbanization of poverty?

Is rural poverty greater than urban poverty? For most of the period, up to about 1986-87, we observe rural poverty to be significantly higher than urban poverty by all poverty measures. Subsequently though there are signs of levelling off, which are more obvious for the PG and the SPG measures.<sup>20</sup> With the sharp

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<sup>20</sup> The convergence of rural and urban headcount indices by 1987-88 is also notable in the recent Planning Commission (1993) estimates. Not all recent studies, however, confirm such a trend toward convergence. For instance, Minhas, Jain and Tendulkar (1991), Jain and Tendulkar (1992) and Tendulkar, Sundaram and Jain (1993) find rural poverty significantly higher than urban poverty right up to 1988-89. The main reason for their different results has to do with their use of a different set of price indices. They use consumer price indices for the "middle" rural and urban population, originally developed by Minhas et al. (1987). The issue of the choice of an appropriate cost of living index is

increase in rural poverty in the 48th round for 1992, we find rural poverty to be considerably higher again at the very end of our study period. Except for this last year, the levelling off of rural and urban poverty rates is of course the obverse of the relatively higher rate of rural poverty decline noted above.

Despite this tendency toward convergence, poverty in India is still predominantly a rural phenomenon. For the most part, this only reflects the fact that India's population is predominantly rural; the sector accounted for 74% of the total population even in 1992. However, there have been significant changes over time. The share of the urban poor has increased by about 64% over the 40-year period, from about 14% in 1951-52 to 23% in 1991-92 (see Tables 7, 9 and Fig. 6). This is partly accounted for by the urbanization of the population; the share of urban population increased by about 52% over this period. The rest is due to the differential rates of decline in rural and urban poverty (as noted above), with the latter falling less rapidly than the former. The share of the urban sector in national poverty witnessed even more rapid increases for other poverty measures. By the squared poverty gap measure, the urban sector now accounts for about one-quarter of national poverty, its share having more than *doubled* over the 40-year period.

#### 4 Decompositions

One can look at the proximate sources of changes in poverty using some simple decomposition tools. We present two types of decompositions: (i) the sectoral decomposition, and (ii) the growth-redistribution decomposition.

The sectoral decomposition addresses the question of how changes in national poverty can be split into the relative contributions of changes in poverty *within* individual sectors, changes in population shares across sectors, and the co-movement between intra-sectoral poverty changes and inter-sectoral population shifts. It is defined as:

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discussed at greater length in Annex C.

$$P_{t+1} - P_t = w_{r,t} ( P_{r,t+1} - P_{r,t} ) + w_{u,t} ( P_{u,t+1} - P_{u,t} ) + \sum_i^{r,u} ( w_{i,t+1} - w_{i,t} ) P_{i,t} + \sum_i^{r,u} ( w_{i,t+1} - w_{i,t} ) ( P_{i,t+1} - P_{i,t} )$$

where  $P_i^t$  is the poverty measure for sector  $i$  at date  $t$ , and  $w_i^t$  is the population share of sector  $i$  at date  $t$ , for  $i$  = rural, urban. The first two terms in the above equation are measures of the *intra*-sectoral effects, or the contribution of within-sector change in poverty to the overall change in national poverty. The third term is due to *inter*-sectoral population shifts, and measures how much national poverty would have changed solely on account of population shifts across sectors if poverty within sectors had remained unchanged. The last term is a covariance term for the interaction of the intra- and inter-sectoral effects.

The growth-redistribution decomposition addresses a different question: how much of a given change in poverty is due to the change in mean consumption (holding relative inequalities or the Lorenz curve constant) and how much is due to the change in relative inequalities or the Lorenz curve (holding mean consumption constant). The former defines the *growth* component (denoted as  $G(\cdot)$  below), the latter the *redistribution* component (denoted  $D(\cdot)$ ). On noting that poverty measures ( $P$ ) can quite generally be written as functions of the mean consumption ( $\mu$ ) and the Lorenz curve ( $L$ ), the basic idea of this decomposition

$$P( \mu_t, L_t ) - P( \mu_{t-1}, L_{t-1} ) = [ P( \mu_t, L_{t-1} ) - P( \mu_{t-1}, L_{t-1} ) ] + [ P( \mu_{t-1}, L_t ) - P( \mu_{t-1}, L_{t-1} ) ] \\ = G( t-1, t; t-1 ) + D( t-1, t; t-1 ) + R( t-1, t; t-1 )$$

(over, say, dates  $t-1$  and  $t$ ) is obvious.



Notice that we have used the mean consumption and the Lorenz curve for date  $t-1$  as the reference in the above decomposition. Alternatively, we could use date  $t$  as the reference, which gives rise to the following

$$\begin{aligned}
 P(\mu_t, L_t) - P(\mu_{t-1}, L_{t-1}) &= [P(\mu_t, L_t) - P(\mu_{t-1}, L_t)] + [P(\mu_t, L_t) - P(\mu_t, L_{t-1})] + Res \\
 &= G(t-1, t; t) + D(t-1, t; t) + R(t-1, t; t)
 \end{aligned}$$

decomposition.

While the choice of the reference date is arbitrary, it turns out that  $R(t-1, t; t-1) = -R(t-1, t; t)$ .<sup>21</sup> Since we are interested in evaluating these decompositions over a long period spanning about 40 years, it is attractive to exploit the last property to define the growth and redistribution components as simple averages of those defined in (3) and (4) above. This yields an exact decomposition (the residual vanishes with the averaging), and it obviates the need to use a fixed reference mean and Lorenz curve for the whole period. This is the approach that we will use below.

#### 4.1 Sectoral decomposition

The results on sectoral decompositions of changes in H, PG and SPG by NSS rounds are shown in Tables 10(a)-10(c). The detailed round-by-round results are somewhat difficult to interpret given the rapid fluctuations in poverty rates over this period. A convenient way to summarize this information is to organize it in cumulative terms. Thus, beginning with an average poverty levels for 1951-55 (as in Table 8), we present the total change since 1951-55, and cumulative contribution of the different components to that total change. We plot these cumulative components in Figures 7(a)-7(c).

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<sup>21</sup> See Datt and Ravallion (1992), which also offers an interpretation of the residual term.

The results show that changes in national poverty are driven largely by changes in rural poverty, which mainly reflects the large share of the rural sector in total population. The rural sector accounted for more than three-quarters of the cumulative change in national headcount index by the end of the period; its contribution is even higher for the PG and SPG measures at about 84-85%. By contrast, the cumulative contribution of the decline in urban poverty has been about 18% for the headcount index and about 12-14% for the PG and SPG measures. The rural-to-urban population shift has been a relatively unimportant source of change in national poverty; its cumulative contribution to the total decline in poverty by the end of the period has been about 6, 3 and 2% for the H, PG and SPG indices.<sup>22</sup> This relatively low contribution of the population shift factor reflects in part the declining differential between rural and urban poverty rates, especially over the period which saw a significant decline in national poverty.

#### 4.2 Growth-redistribution decompositions

The results of this decomposition of changes in national poverty are shown in Table 11. As for sectoral decomposition, it is easier to interpret the trends in the components by focusing on cumulative rather than round-to-round changes. These cumulative changes and the components are graphed in Figures 8(a)-8(c). Any point on the graph shows the cumulative change in the poverty measure since 1951-55, and cumulative contribution of the growth and redistribution components to that change.<sup>23</sup> A rising segment on the graph for total change in the poverty measure indicates an increase in poverty since the last round; a rising segment on the graph for a component indicates that the component has contributed to an increase in poverty since the last round. Several points are notable about these results.

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<sup>22</sup> The contribution of the covariance term is negligible.

<sup>23</sup> Since poverty measures are subject to large fluctuations particularly in the initial rounds, and the cumulative series can be quite misleading for arbitrary choice of the starting point of cumulation, we wanted to start cumulating from a point which is close to the average of the early 1950s. For the first decomposition in the cumulative series, we thus selected NSS round 6 (May-September 1953) as the reference date, since the poverty measures for this round reasonably approximate the average poverty measures for 1951-55 (rounds 3-8; see Tables 5, 6). The first decomposition for round 9 can be broadly interpreted as the cumulative change in poverty (and its components) since the mid-point of the period 1951-55.

i) The graphs for the cumulative change in national poverty confirm that it is not until 1970 that we witness the start of a trend decline in poverty relative to the levels observed for 1951-55. The process started in the early 1970s for the PG and the SPG measures; it started somewhat later for the headcount index in the late-1970s (around 32nd round for 1977-78).

ii) In cumulative terms, while the redistribution component has contributed to a decline in the headcount index, its contribution has been quantitatively small. The growth in mean consumption has clearly been more important for changes in the headcount index, accounting for about 80% of the cumulative decline by the end of the period.

iii) The relative contribution of the two components changes significantly for the other poverty measures. For the PG index, the redistribution component accounts for about 40% of the cumulative decline by the end of the period; its contribution is even higher at about 47% for the SPG index. Favorable redistribution has thus been quite important for changes in the depth and severity of poverty.

iv) Most of the favorable impact of redistribution (especially for the PG and the SPG indices) is realized early on, during the early-to-mid 1960s, well before the onset of the sustained decline in the national poverty measures. Since the mid-1960s, the redistribution component seems to have fluctuated without making a further addition to its cumulative impact on national poverty.

v) There does not seem to be a systematic relation between the growth and redistribution components. The correlation coefficients between the two components range from -0.21 to -0.26 for the three poverty measures, and are not significant statistically.

A point related to the above discussion has to do with the estimated elasticities of the poverty measures with respect to mean living standards, sometimes dubbed as growth elasticities. There can be two different measures of these growth elasticities: the theoretical point elasticities and the empirical arc elasticities. While the theoretical elasticities are analytically derived from the properties of particular poverty functions and hold the Lorenz curve constant, the empirical elasticities are the ratios of the actual proportionate change in poverty measures to actual proportionate changes in real mean consumption. The

latter therefore incorporate the observed distributional changes. Are the theoretical elasticities which can be computed from a single survey a good guide to empirical elasticities? A negative answer is suggested in Figure 10(?) which plots the absolute growth elasticities for the national poverty gap index.<sup>24</sup> The empirical elasticities fluctuate a lot more than the theoretical elasticities. Notice also that while the absolute growth elasticities are always positive (as they must be, by construction), the empirical growth elasticities are often negative. The point elasticities are not even a good measure of the trend values of the empirical elasticities. The divergence between the two is a measure of actual redistribution associated with the growth process.

Has the growth process been distributionally neutral over this four decade period? With a distribution neutral process, the cumulative contribution of the redistribution component would have been expected to be zero at the end of period. The above results clearly indicate that this is not so. On the contrary, favorable redistribution has contributed significantly to the observed decline in poverty, contributing 40% or more for the PG and SPG measures.

## 5 Conclusion

Long time-series data on distribution of income or expenditure are relatively rare. From that perspective, the results presented in this paper on the evolution of poverty and distributional measures for India spanning more than a 40-year period are quite unique. We have sought to extend past work in a number of ways. Our series covers a longer period than any other that we know of, going further back into the early 1950s, and including the most recent available NSS data. A consistent urban poverty series is also constructed alongside the rural one. Apart from the headcount index, the series are constructed for two other poverty measures, namely the poverty gap index and the distributionally sensitive squared poverty gap index.

While there are clear signs of progress in reducing poverty in India during the 1980s, our new series shows that over the four-decade period as a whole the reduction in the proportion of the population who are

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<sup>24</sup> The theoretical absolute growth elasticity of the PG index is computed as  $(H/PG - 1)$ . See Kakwani (1990).

poor has not been as impressive as may have been presumed. The trend annual rate of decline in the headcount index during 1951-92 was about 0.8% per year. Most of the gains in poverty reduction were concentrated over the late 1970s and early 1980s. Indeed, it was not until the early 1980s that India's poverty measures fell appreciably below the levels of 30 years earlier. The index of the severity of poverty (the squared poverty gap index) does show a more impressive reduction, particularly in rural areas, though (again) the real gains were largely confined to the late 1970s to mid-1980s. The decline in poverty rates has however not been large or sustained enough to halt the burgeoning ranks of the poor. With the absolute number of the poor having increased by more than 120 million over the four decades (from 199 million in 1951-55 to about 323 million in 1991-92), "*garibi hatao* (remove poverty)" still remains an elusive goal.

We have also looked at the proximate sources of change in the poverty measures. Sectoral decompositions indicate that changes in national poverty have been for the most part driven by changes in rural poverty. The rural sector accounted for more than three-fourths of the total decline in national poverty. Both growth in mean consumption and redistribution contributed to the overall decline in poverty rates. The contribution of the redistribution component was upwards of two-fifths for the poverty gap and the squared poverty gap measures, though most of the redistributive gains were realized in the 1960s, well before the growth-induced decline in poverty during the late-1970s to mid-1980s.

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**Table 1: NSS data sources on consumption distributions: 1951 - 1994**

S. no.	NSS Round	Period	Source	Rural Tables (Number of sample households)	Urban Tables (Number of sample households)	Regional detail/ comments
1	3 *week	Aug 51 - Nov 51	GOI (1959). NSS Second to Seventh Round: April 1951 - March 1954: Report on Pattern of Consumer Expenditure. No. 20.	Tables 1.40 (p. 64), 1.60.2 (p. 66-67); 1.50 (p. 57), 1.70.2 (p. 129).  (5103)	Tables 2.40 (p. 152), 2.60.2 (p. 162-163); 2.50 (p. 157), 2.70.2 (p. 204).  (1690)	6 rural zones, 4 size-groups of towns.
2	4	Apr 52 - Sep 52	Same as 1.	Tables 1.40 (p. 64), 1.60.4 (p. 70-71); 1.50 (p. 57), 1.70.4 (p. 131).  (2388)	Tables 2.40 (p. 152), 2.60.4 (p. 166-167); 2.50 (p. 157), 2.70.4 (p. 206).  (1074)	Same as Round 3.
3	5	Dec 52 - Mar 53	Same as 1.	Tables 1.40 (p. 64), 1.60.6 (p. 74-75); 1.50 (p. 57), 1.70.6 (p. 133).  (1361)	Tables 2.40 (p. 152), 2.60.6 (p. 170-171); 2.50 (p. 157), 2.70.6 (p. 208).  (618)	Same as Round 3.
4	6 *week	May 53 - Sep 53	Same as 1.	Tables 1.40 (p. 64), 1.60.7 (p. 76-77); 1.50 (p. 57), 1.70.7 (p. 134).  (1403)	Tables 2.40 (p. 152), 2.60.7 (p. 172-173); 2.50 (p. 157), 2.70.7 (p. 209).  (514)	Same as Round 3.
5	7	Oct 53 - Mar 54	Same as 1.	Tables 1.40 (p. 64), 1.60.8 (p. 78-79); 1.50 (p. 57), 1.70.8 (p. 135).  (1413)	Tables 2.40 (p. 152), 2.60.8 (p. 174-175); 2.50 (p. 157), 2.70.8 (p. 210).  (558)	Same as Round 3.
6	8	Jul 54 - Mar 55	GOI (1961a). NSS Eighth Round: July 1954 - March 1955: Tables With Notes on Consumer Expenditure. No. 39.	Tables 1.40 (p. 14), 1.60 (p. 16-17); 1.50 (p. 15), 1.70 (p. 30-31).  (1869)	Tables 2.40 (p. 47), 2.60 (p. 50-51); 2.50 (p. 48-49), 2.70 (p. 60-61).  (1855)	Same as Round 3. JK included first time.
7	9	May 55 - Nov 55	GOI (1961b). NSS Ninth Round: May - November 1955: Tables With Notes on Consumer Expenditure. No. 40.	Tables 1.40 (p. 14), 1.60 (p. 16-17); 1.50 (p. 15), 1.70 (p. 30-31).	Tables 2.40 (p. 47), 2.60 (p. 50-51); 2.50 (p. 48-49), 2.70 (p. 64-65).	6 zones (rural and urban), 4 big cities.

S. no.	NSS Round	Period	Source	Rural Tables (Number of sample households)	Urban Tables (Number of sample households)	Regional detail/ comments
				(1616)	(2100)	
8	10	Dec 55 - May 56	GOI (1961c). NSS Tenth Round: December 1954 - May 1955: Tables With Notes on Consumer Expenditure. No. 47.	Tables 1.40 (p. 18), 1.60 (p. 20-21); 1.50 (p. 19), 1.70 (p. 34-35). (1616)	Tables 2.40 (p. 70), 2.60 (p. 72-73); 2.50 (p. 71), 2.70 (p. 86-87). (1326)	Same as Round 9.
9	11	Aug 56 - Feb 57	GOI (1963a). NSS Eleventh Round: August 1954 - February 1955: Tables With Notes on Consumer Expenditure. No. 77.	Tables 1.40 (p. 15), 1.60 (p. 17-18); 1.50 (p. 16), 1.70 (p. 31-32). (7255)	Tables 2.40 (p. 63), 2.60 (p. 65-66); 2.50 (p. 64), 2.70 (p. 79-80). (2840)	Same as Round 9.
10	12	Mar 57 - Aug 57	GOI (1963b). NSS Twelfth Round: March-August 1957: Tables With Notes on Consumer Expenditure. No. 78.	Tables 1.40 (p. 16), 1.60 (p. 18-19); 1.50 (p. 17), 1.70 (p. 32-33). (7248)	Tables 2.40 (p. 64), 2.60 (p. 66-67); 2.50 (p. 65), 2.70 (p. 80-81). (2858)	Same as Round 9.
11	13	Sep 57 - May 58	GOI (1963c). NSS Thirteenth Round: September 1957 - May 1958: Tables With Notes on Consumer Expenditure. No. 80.	Tables 1.4.0 (p. 20-21), 1.6.0 (p. 24-25); 1.5.0 (p. 22-23), 1.7.0 (p. 56-57). (6738)	Tables 2.4.0 (p. 131-132), 2.6.0 (p. 135-136); 2.5.0 (p. 133-134), 2.7.0 (p. 167-168). (3583)	14 states, UT comb., 4 big cities.
12	14	Jul 58 - Jun 59	GOI (1965). NSS Fourteenth Round: July 1958 - June 1959: Tables With Notes on Consumer Expenditure. No. 102.	Tables 1.4.0 (p. 22-23), 1.6.0 (p. 26-27); 1.5.0 (p. 24-25), 1.7.0 (p. 28-29). (7589)	Tables 2.4.0 (p. 61-62), 2.6.0 (p. 65-66); 2.5.0 (p. 63-64), 2.7.0 (p. 67-68). (2218)	15 states, UT comb., 4 big cities. Bombay split into Maharashtra and Gujarat. Unit values of staples given first time. <sup>+</sup>
13	15	Jul 59 - Jun 60	GOI (1966). NSS Fifteenth Round: July 1959 - June 1960: Tables With Notes on Consumer Expenditure. No. 104.	Tables 1.4.0 (p. 21-22), 1.6.0 (p. 25-26); 1.5.0 (p. 23-24), 1.7.0 (p. 27-28). (7700)	Tables 2.4.0 (p. 50-51), 2.6.0 (p. 54-55); 2.5.0 (p. 52-53), 2.7.0 (p. 56-57). (2201)	Same as Round 14. <sup>+</sup>
14	16	Jul 60 - Aug 61	GOI (1969). NSS Sixteenth Round: July 1960 - June 1961: Tables With Notes on Consumer Expenditure. No. 138.	Tables 1.4.0 (p. 15-16), 1.6.0 (p. 19-20); 1.5.0 (p. 17-18), 1.7.0 (p. 21-22).	Tables 2.4.0 (p. 43-44), 2.6.0 (p. 47-48); 2.5.0 (p. 45-46), 2.7.0 (p. 59-50).	Same as Round 14. <sup>+</sup>

S. no.	NSS Round	Period	Source	Rural Tables (Number of sample households)	Urban Tables (Number of sample households)	Regional detail/ comments
				(3762)	(2568)	
15	17	Sep 61 - Jul 62	GOI (1974). NSS Seventeenth Round: September 1961 - July 1962: Tables With Notes on Consumer Expenditure (Integrated Household Survey - Schedule 17). No. 184.	Tables B1.3.0 (p. 207-209), B1.5.0 (p. 213-215); B1.4.0 (p. 210-212), B1.6.0 (p. 232-236). (7173)	Tables B2.3.0 (p. 394-396), B2.5.0 (p. 400-402); B2.4.0 (p. 397-399), B2.6.0 (p. 419-422). (5247)	Same as Round 14.
16	18	Feb 63 - Jan 64	GOI (1968). NSS Eighteenth Round: February 1963 - January 1964: Tables With Notes on Consumer Expenditure (Preliminary). No. 142.	Tables 1.3.0 (p. 17-18), 1.5.0 (p. 21-22); 1.4.0 (p. 19-20), 1.6.0 (p. 55-56). (21776)	Tables 2.3.0 (p. 90-91), 2.5.0 (p. 94-95); 2.4.0 (p. 92-93), 1.6.0 (p. 128-129). (4296)	Same as Round 14.
17	19	Jul 64 - Jun 65	GOI (1972). NSS Nineteenth Round: July 1964 - June 1965: Tables With Notes on Consumer Expenditure. No. 192. or GOI (1971). NSS Nineteenth Round: July 1964 - June 1965: Tables With Notes on Consumer Expenditure (Preliminary). No. 179.	Tables 1.3.0 (p. 18-20), 1.5.0 (p. 23-29); 1.4.0 (p. 21-22). or Tables 1.3.0 (p. 19-21), 1.5.0 (p. 25-26); 1.4.0 (p. 22-24), 1.6.0 (p. 61-63). (14974)	Tables 2.3.0 (p. 60-62), 2.5.0 (p. 66-70); 2.4.0 (p. 63-65). or Tables 2.3.0 (p. 70-72), 2.5.0 (p. 76-77); 2.4.0 (p. 73-75), 1.6.0 (p. 112-114). (9943)	16 states, UT comb., 4 big cities. New state: Haryana
18	20	Jul 65 - Jun 66	GOI (19..). NSS Twentieth Round: July 1965 - June 1966: Tables With Notes on Consumer Expenditure. No. 209.	Tables 1.6.0 (p. 43), 1.9.0 (p. 55); 1.8.0 (p. 54), 1.10.0 (p. 73). (14619)	Tables 2.6.0 (p. 122), 2.9.0 (p. 134); 2.8.0 (p. 133), 1.10.0 (p. 152). (9277)	Same as Round 19.
19	21	Jul 66 - Jun 67	GOI (1977). NSS Twenty-First Round: July 1966 - June 1967: Tables With Notes on Consumer Expenditure (Preliminary). No. 230.	Tables 5/R (p. 55), 6.01/R (p. 56); 7.01/R (p. 80). (16399)	Tables 5/U (p. 152), 6.01/U (p. 153); 7.01/U (p. 177). (13062)	As in Round 19; also separate UTs: Delhi, Goa, HP, Manipur, Pondicherry & Tripura.
20	22	Jul 67 - Jun 68	GOI (1976a). NSS Twenty-Second Round: July 1967 - June 1968: Tables With Notes on Consumer Expenditure. No. 216.	Tables 1.5.0 (p. 77), 1.7.0 (p. 91); 1.6.0 (p. 90), 1.8.0 (p. 115).	Tables 2.5.0 (p. 191), 2.7.0 (p. 205); 2.6.0 (p. 204), 2.8.0 (p. 229).	Same as Round 21.

S. no.	NSS Round	Period	Source	Rural Tables (Number of sample households)	Urban Tables (Number of sample households)	Regional detail/ comments
				(16293)	(8624)	
21	23	Jul 68 - Jun 69	GOI (1976b). NSS Twenty-Third Round: July 1968 - June 1969: Tables With Notes on Consumer Expenditure. No. 228.	Tables 3/R (p. 11), 6.0/R (p. 14); 4/R (p. 12), 7.0/R (p. 38).  (9116)	Tables 3/U (p. 64), 6.0/U (p. 67); 4/U (p. 65), 7.0/U (p. 92).  (9458)	17 states, UT comb. & separate, 4 big cities. New state: Nagaland.
22	24	Jul 69 - Jun 70	GOI (1978a). NSS Twenty-Fourth Round: July 1969 - June 1970: Tables With Notes on Consumer Expenditure. No. 235.	Tables 3/R (p. 15), 5.25/R (p. 40); 4/R (p. 16), 6.25/R (p. 42).  (33258)	Tables 3/U (p. 45), 5.25/U (p. 71); 4/U (p. 46), 6.25/U (p. 73).  (19262)	Same as Round 23.
23	25	Jul 70 - Jun 71	GOI (1978b). NSS Twenty-Fifth Round: July 1970 - June 1971: Tables With Notes on Consumer Expenditure. No. 231.	Tables 4/R (p. 21-26), 5.26/R (p. 50); 3/R (p. 15-20), 7.26/R (p. 98).  (37593)	Tables 4/U (p. 108-114), 5.26/U (p. 139); 3/U (p. 101-107), 7.26/U (p. 189).  (18930)	As in Round 23; also no. of adult males, females, children by expenditure groups. New UT: Chandigarh.
24	27	Oct 72 - Sep 73	GOI (1979). Results on the First Quinquennial Survey on Consumer Expenditure: NSS 27th Round. <i>Sarvekshana</i> . vol. 2, no. 3, January.	Tables 1.27/R (p. S305), 3.27/R (p. S355).  (72270)	Tables 1.27/U (p. S369), 3.27/U (p. S423).  (52820)	21 states, 4 UTs (also UTs comb.), 4 big cities. New states: HP, Manipur, Meghalaya, Tripura.
25	28	Oct 73 - Jun 74	GOI (1978c). NSSO Twenty-Eighth Round: October 1973 - September 1974: Tables on Consumer Expenditure. No. 240.	Tables 1.27/R (p. 19), 2.27/R (p. 44).  (15467)	Tables 1.27/U (p. 83), 2.27/U (p. 110).  (7881)	Same as Round 27.
26	32	Jul 77 - Jun 78	GOI (1986a). Some Results on the Second Quinquennial Survey on Consumer Expenditure: NSS 32nd Round. <i>Sarvekshana</i> . vol. 9, no. 3, January.	Tables 1.0R (p. S54), 3.0R (p. S92).  (99766)	Tables 1.0U (p. S117), 3.0U (p. S158).  (58162)	21 states, 5 UTs; 4 big cities dropped.

S. no.	NSS Round	Period	Source	Rural Tables (Number of sample households)	Urban Tables (Number of sample households)	Regional detail/ comments
27	38	Jan 83 - Dec 83	GOI (1986b). Key Results on the Third Quinquennial Survey on Consumer Expenditure: NSS 38th Round. <i>Sarvekshana</i> . vol. 9, no. 4, April.	Tables 1.0R (p. S17), 2.0R (p. S46).  (75913)	Tables 1.0U (p. S31), 2.0U (p. S74).  (41983)	22 states, 9 UTs, but Arunachal Pradesh, Lakshadweep not available. New state: Sikkim.
28	42	Jul 86 - Jun 87	GOI (1989). Results on Consumer Expenditure: NSS 42nd Round. <i>Sarvekshana</i> . vol. 12, no. 4, April-June.	Tables 1.0R (p. S17), 3.0R (p. S76).  (16626)	Tables 1.0U (p. S121), 3.0U (p. S181).  (9135)	23 states, 8 UTs, but Arunachal Pradesh not available. New state: Mizoram.
29	43	Jul 87 - Jun 88	GOI (1993). Level and Pattern of Consumption of Different Socio-Economic Groups of Households: Report on the Fourth Quinquennial Survey on Consumer Expenditure: NSS 43 <sup>rd</sup> Round (July 1987-June 1988). No. 383.	Statement 1R (p.20), 5R (p.28).  (82661)	Statement 1U (p.21), 5U (p.29).  (45358)	As in Round 42; but including Arunachal Pradesh. <sup>+</sup>
30	44	Jul 88 - Jun 89	GOI (1991b). Results of Consumer Expenditure Survey (All-India): NSS 44th Round. <i>Sarvekshana</i> . vol. 14, no. 3, January-March.	Tables 1 (p. S6), 3 (p. S8).  (15003)	Tables 1 (p. S9), 3 (p. S11).  (9595)	Only all-India results.
31	45	Jul 89 - Jun 90	GOI (1992a). Results on the Third Annual Survey on Consumer Expenditure and Employment-Unemployment: NSS 45th Round. <i>Sarvekshana</i> . vol. 16, no. 1, July-September.	Tables 1 (p. S212), 3 (p. S216).  (14503)	Tables 1 (p. S213), 3 (p. S217).  (14241)	All-India; 15 states and 3 regions. <sup>+</sup>
32	46	Jul 90 - Jun 91	GOI (1993). Tables with Notes on the Fourth Annual Survey on Consumer Expenditure and Employment - Unemployment: NSS 46th Round (July 1990 - June 1991). No. 386.	Tables 1 (p. A1), 4 (p. A11).  (13750)	Tables 1 (p. A2), 4 (p. A12).  (14805)	All-India; 15 states and 3 regions. <sup>+</sup>
33	47	Jul 91 - Dec 91	GOI (1992b). Tables with Notes on Fifth Annual Survey on Consumer Expenditure and Employment - Unemployment: NSS 47th Round (July - December 1991). Provisional Results. No. 388/1.	Tables 1R (p. A1), 2R (p. A3).  (8316)	Tables 1U (p. A2), 2U (p. A4).  (4744)	Only all-India results.
34	48	Jan 92 - Dec 92	GOI (1994). Household Consumer Expenditure and Employment Situation in India: January -	Tables 2 (p. A5), 4 (p. A9).	Tables 2 (p. A6), 4 (p. A10).	All-India; 15 states and 3

S. no.	NSS Round	Period	Source	Rural Tables (Number of sample households)	Urban Tables (Number of sample households)	Regional detail/ comments
			December 1992: NSS 48th Round. No. 397.	(8324)	(4808)	regions. <sup>+</sup>
35	50	Jul 93 - Jun 94	GOI (1996). Consumption of Some Important Commodities in India: NSS 50th Round 1993-94. No. 404.	Tables 9 (p. A257), 10 (pp. A296-7). (69206)	Tables 9 (p. A265), 10 (pp. A328-9). (48148)	All-India; 15 major states. <sup>+</sup>

Note: (1) \*week: Refers to the reference period of a week in these two NSS rounds, as against a month used in all other rounds.  
(2) In most cases, two sets of tables have been cited. The first has data on the relative frequency (percentage of the population) and the mean per capita expenditure for different size-classes of per capita expenditure; the second gives the average household size and the composition of expenditure for different expenditure classes.  
(3) <sup>+</sup> In these cases, the state distributions only report the frequency of the population within each per capita expenditure class interval, but do not report the mean per capita expenditure *within* those intervals.

**Table 2: Share of home-grown foodgrains in total consumption: 1964-65 (NSS 19th round)**

Monthly per capita expenditure (Rs.)	Rural			Urban		
	Percentage of population	Cumulative percentage of population	Share of home-grown foodgrains in total consumption expenditure (%)	Percentage of population	Cumulative percentage of population	Share of home-grown foodgrains in total consumption expenditure (%)
0-8	3.18	3.18	13.8	0.7	0.7	1.0
8-11	5.99	9.17	17.3	3.12	3.82	1.6
11-13	7.18	16.35	19.6	4.11	7.93	3.9
13-15	8.68	25.03	25.0	5.78	13.71	1.3
15-18	12.92	37.95	24.1	10.88	24.59	2.1
18-21	13.35	51.3	24.5	8.96	33.55	3.0
21-24	11.06	62.36	25.4	10.39	43.94	2.0
24-28	10.96	73.32	26.8	10.82	54.76	4.4
28-34	10.27	83.59	26.0	11.9	66.66	3.5
34-43	8.29	91.88	23.2	11.86	78.52	2.3
43-55	4.16	96.04	21.2	8.59	87.11	1.5
55-75	2.29	98.33	14.9	6.77	93.88	1.2
75 & above	1.67	100	9.1	6.12	100	0.7
All	100		22.2	100		2.0

Note: Compiled from GOI (1971) *Tables with Notes on Household Consumer Expenditure and Enterprise for Rural and Urban Areas of India: Integrated Household Survey (Schedule 17)*, Report Number 189.



**Table 3: Mean Consumption, Ginis, and Price Indices by NSS Rounds: 1951-1994**

NSS round	Survey period	Real mean per capita consumption (Rs per month at Oct 73-Jun 74 rural prices)			Gini index			Consumer price index (Oct 73-Jun 74 = 100)	
		Rural	Urban	National	Rural	Urban	National	Rural	Urban
3	Aug 51-Nov 51	61.24	84.55	65.28	33.72	40	35.66	35.32	31.8
4	Apr 52-Sep 52	64.82	78.86	67.26	34.37	37.3	35.18	31.38	30.9
5	Dec 52-Mar 53	60.18	79.16	63.49	33.53	40.98	35.47	31.04	30.9
6	May 53-Sep 53	55.18	70.53	57.86	33.27	37.53	34.48	33.91	32.9
7	Oct 53-Mar 54	51.54	64.56	53.82	33.75	37.66	34.9	31.55	31.3
8	Jul 54-Mar 55	49.54	70.64	53.24	35.54	39.56	37.15	28.48	29.6
9	May 55-Nov 55	57.74	70.72	60.02	34.13	37.46	35.09	26.32	28.8
10	Dec 55-May 56	63.10	72.06	64.68	34.8	37.3	35.4	27.91	30.1
11	Aug 56-Feb 57	53.28	65.96	55.52	32.21	40.78	34.24	31.85	32.7
12	Mar 57-Aug 57	51.46	68.50	54.48	33.58	40.14	35.45	33.64	33.3
13	Sep 57-May 58	55.66	65.27	57.37	33.74	36.4	34.46	33.40	33.8
14	Jul 58-Jun 59	58.16	67.01	59.74	34.29	35.57	34.68	34.61	36.0
15	Jul 59-Jun 60	58.96	64.39	59.93	31.65	36.39	32.62	34.14	37.2
16	Jul 60-Aug 61	63.24	67.41	63.99	32.48	35.57	33.11	33.95	37.6
17	Sep 61-Jul 62	61.53	68.56	62.81	31.61	36.28	32.63	35.32	38.7
18	Feb 63-Jan 64	57.98	69.65	60.13	28.94	36.54	30.77	38.58	40.7
19	Jul 64-Jun 65	55.11	63.93	56.76	29.71	35.57	31.08	47.98	48.4
20	Jul 65-Jun 66	52.85	60.02	54.20	30.13	34.51	31.16	53.74	52.5

NSS round	Survey period	Real mean per capita consumption (Rs per month at Oct 73-Jun 74 rural prices)			Gini index			Consumer price index (Oct 73-Jun 74 = 100)	
		Rural	Urban	National	Rural	Urban	National	Rural	Urban
21	Jul 66-Jun 67	47.78	60.09	50.13	29.69	34.69	31.1	64.67	59.4
22	Jul 67-Jun 68	47.60	59.50	49.89	29.08	34.5	30.58	70.17	64.8
23	Jul 68-Jun 69	52.55	62.02	54.39	30.97	34.25	31.88	63.35	63.8
24	Jul 69-Jun 70	52.56	65.98	55.20	29.82	35.86	31.49	66.02	65.7
25	Jul 70-Jun 71	53.75	66.68	56.32	28.76	34.69	30.39	65.69	68.1
27	Oct 72-Sep 73	54.60	66.36	57.02	30.67	34.7	31.85	80.90	82.0
28	Oct 73-Jun 74	53.01	60.84	54.64	28.54	30.79	29.17	100.00	100.0
32	Jul 77-Jun 78	58.25	70.85	61.05	30.92	34.71	32.09	112.99	119.4
38	Jan 83-Dec 83	61.46	75.23	64.75	30.1	34.08	31.34	183.35	194.8
42	Jul 86-Jun 87	66.99	80.69	70.37	30.22	36.75	32.04	211.15	251.8
43	Jul 87-Jun 88	66.60	76.61	69.10	29.39	34.64	31.68	236.74	275.7
44	Jul 88-Jun 89	66.57	76.60	69.10	29.51	34.8	31.02	263.04	299.5
45	Jul 89-Jun 90	69.03	80.23	71.88	28.23	35.59	30.32	274.48	319.3
46	Jul 90-Jun 91	66.73	78.37	69.72	27.72	33.98	29.53	302.87	358.5
47	Jul 91-Dec 91	68.50	83.83	72.46	29.91	37.98	32.35	351.35	398.8
48	Jan 92-Dec 92	63.80	80.10	68.05	29.88	35.11	32.02	387.50	428.1
50	Jul 93-Jun 94	67.45	82.49	71.42	28.58	34.34	30.68	417.19	477.3
Trend rate of growth during 1951-94 (% per year)		0.41	0.31	0.44	-0.40	-0.24	-0.32	6.44	6.78

Note: The numbers in parentheses are those obtained without correction of the CPIAL indices for firewood prices.

**Table 4: Cumulative Shares of deciles of the national population in total consumption expenditure**

NSS Round	Mid-point of the survey period	Share of bottom ..% of the national population in total consumption (%)								
		10%	20%	30%	40%	50%	60%	70%	80%	90%
3	1951.75	2.85	7.04	12.38	18.80	26.31	34.99	45.07	57.01	72.04
4	1952.50	2.83	7.14	12.50	18.92	26.44	35.20	45.44	57.60	72.73
5	1953.08	2.88	7.11	12.49	18.94	26.47	35.17	45.23	57.12	72.03
6	1953.54	2.90	7.22	12.73	19.33	27.02	35.85	46.04	58.01	72.94
7	1954.00	3.27	7.64	12.97	19.27	26.66	35.27	45.35	57.38	72.45
8	1954.88	2.99	7.04	12.09	18.16	25.31	33.68	43.55	55.46	70.82
9	1955.63	3.17	7.31	12.45	18.67	26.08	34.84	45.23	57.69	73.29
10	1956.17	3.24	7.52	12.79	19.06	26.37	34.86	44.80	56.69	71.91
11	1956.88	3.38	8.05	13.63	20.11	27.54	36.06	45.90	57.49	71.94
12	1957.42	3.17	7.72	13.19	19.57	26.90	35.32	45.06	56.57	71.00
13	1958.04	3.15	7.52	12.97	19.45	26.99	35.68	45.74	57.64	72.61
14	1959.00	3.24	7.65	13.12	19.58	27.06	35.66	45.59	57.31	72.03
15	1960.00	3.67	8.40	14.08	20.71	28.30	36.97	46.93	58.64	73.27
16	1961.08	3.45	8.06	13.70	20.32	27.95	36.67	46.70	58.49	73.20
17	1962.13	3.62	8.37	14.11	20.79	28.43	37.12	47.05	58.66	73.07
18	1963.58	3.78	8.89	14.89	21.78	29.58	38.42	48.49	60.19	74.45
19	1965.00	3.72	8.75	14.70	21.54	29.32	38.16	48.26	60.02	74.38
20	1966.00	3.73	8.75	14.69	21.51	29.27	38.09	48.18	59.93	74.29

NSS Round	Mid-point of the survey period	Share of bottom ..% of the national population in total consumption (%)								
		10%	20%	30%	40%	50%	60%	70%	80%	90%
21	1967.00	3.58	8.43	14.36	21.28	29.18	38.14	48.34	60.19	74.74
22	1968.00	3.67	8.61	14.62	21.60	29.55	38.53	48.73	60.53	74.97
23	1969.00	3.57	8.51	14.37	21.14	28.85	37.63	47.68	59.41	73.81
24	1970.00	3.64	8.62	14.51	21.31	29.05	37.87	47.96	59.72	74.13
25	1971.00	3.78	8.77	14.79	21.77	29.70	38.64	48.79	60.53	74.91
27	1973.25	3.62	8.53	14.36	21.10	28.80	37.58	47.66	59.44	73.90
28	1974.13	3.82	8.95	15.05	22.10	30.15	39.31	49.76	61.86	76.44
32	1978.00	3.65	8.45	14.24	20.97	28.67	37.42	47.40	59.05	73.47
38	1983.50	3.75	8.62	14.49	21.29	29.04	37.84	47.87	59.54	73.97
42	1987.00	3.70	8.50	14.29	21.00	28.67	37.37	47.31	58.91	73.29
43	1988.00	3.91	8.85	14.71	21.44	29.08	37.72	47.54	58.96	73.07
44	1989.00	3.99	8.98	14.88	21.66	29.35	38.05	47.96	59.50	73.80
45	1990.00	3.92	9.09	15.12	22.00	29.79	38.59	48.62	60.26	74.45
46	1991.00	4.00	9.11	15.20	22.21	30.14	39.07	49.18	60.88	75.20
47	1991.75	3.88	8.96	14.84	21.50	28.98	37.40	46.98	58.13	71.91
48	1992.5	3.86	8.84	14.67	21.34	28.91	37.51	47.36	58.88	73.10

**Table 5: Poverty in India 1951 - 1994 (with correction for CPIAL) (Poverty line = Rs. 49 / person / month at Oct 73 - Jun 74 rural prices)**

NSS round	Survey period	Headcount index			Poverty gap index			Squared poverty gap index		
		Rural	Urban	National	Rural	Urban	National	Rural	Urban	National
3	Aug 51-Nov 52	47.37	35.46	45.31	16.050	11.141	15.199	7.531	4.824	7.062
4	Apr 52-Sep 52	43.87	36.71	42.63	14.637	10.914	13.990	6.705	4.408	6.306
5	Dec 52-Mar 53	48.21	40.14	46.80	16.290	13.246	15.760	7.562	5.955	7.282
6	May 53-Sep 53	54.13	42.77	52.15	19.030	13.831	18.123	9.118	6.286	8.624
7	Oct 53-Mar 54	61.29	49.92	59.30	21.946	17.238	21.123	10.263	7.739	9.822
8	Jul 54-Mar 55	64.24	46.19	61.07	25.041	15.763	23.413	12.503	7.024	11.542
9	May 55-Nov 55	51.83	43.92	50.44	18.443	14.648	17.775	8.804	6.398	8.381
10	Dec 55-May 56	48.34	43.15	47.43	15.646	13.342	15.240	6.710	5.411	6.481
11	Aug 56-Feb 57	58.86	51.45	57.55	19.449	18.162	19.221	8.496	8.509	8.498
12	Mar 57-Aug 57	62.11	48.88	59.77	21.685	16.308	20.732	10.005	7.246	9.516
13	Sep 57-May 58	55.16	47.75	53.84	19.011	15.950	18.467	8.778	6.997	8.462
14	Jul 58-Jun 59	53.26	44.76	51.75	17.736	13.748	17.025	7.882	5.871	7.524
15	Jul 59-Jun 60	50.89	49.17	50.58	15.289	15.829	15.386	6.129	6.749	6.240
16	Jul 60-Aug 61	45.40	44.65	45.27	13.601	13.842	13.644	5.532	5.828	5.585
17	Sep 61-Jul 62	47.20	43.55	46.54	13.601	13.789	13.635	5.314	6.046	5.447
18	Feb 63-Jan 64	48.53	44.83	47.85	13.883	13.291	13.774	5.486	5.174	5.429
19	Jul 64-Jun 65	53.66	48.78	52.75	16.083	15.241	15.926	6.602	6.383	6.561
20	Jul 65-Jun 66	57.60	52.90	56.71	17.968	16.821	17.751	7.603	6.981	7.486
21	Jul 66-Jun 67	64.30	52.24	62.00	22.010	16.810	21.018	10.010	7.187	9.472

NSS round	Survey period	Headcount index			Poverty gap index			Squared poverty gap index		
		Rural	Urban	National	Rural	Urban	National	Rural	Urban	National
22	Jul 67-Jun 68	63.67	52.91	61.60	21.802	16.930	20.863	9.852	7.220	9.345
23	Jul 68-Jun 69	59.00	49.29	57.11	18.956	15.539	18.291	8.165	6.542	7.849
24	Jul 69-Jun 70	57.61	47.16	55.56	18.237	14.316	17.466	7.729	5.863	7.362
25	Jul 70-Jun 71	54.84	44.98	52.88	16.545	13.347	15.910	6.798	5.349	6.510
27	Oct 72-Sep 73	55.36	45.67	53.37	17.348	13.459	16.548	7.328	5.262	6.903
28	Oct 73-Jun 74	55.72	47.96	54.10	17.175	13.602	16.430	7.128	5.219	6.730
32	Jul 77-Jun 78	50.60	40.50	48.36	15.025	11.687	14.284	6.057	4.526	5.717
38	Jan 83-Dec 83	45.31	35.65	43.00	12.649	9.517	11.901	4.841	3.557	4.534
42	Jul 86-Jun 87	38.81	34.29	37.69	10.013	9.100	9.787	3.700	3.395	3.625
43	Jul 87-Jun 88	39.23	36.20	38.47	9.275	9.121	9.237	2.982	3.056	3.000
44	Jul 88-Jun 89	39.06	36.60	38.44	9.504	9.537	9.512	3.291	3.293	3.292
45	Jul 89-Jun 90	34.30	33.40	34.07	7.799	8.505	7.979	2.575	3.038	2.693
46	Jul 90-Jun 91	36.43	32.76	35.49	8.644	8.509	8.609	2.926	3.121	2.976
47	Jul 91-Dec 91	37.42	33.23	36.34	8.288	8.244	8.277	2.680	2.902	2.737
48	Jan 92-Dec 92	43.47	33.73	40.93	10.881	8.824	10.345	3.810	3.191	3.649
50	Jul 93-Jun 94	36.66	30.51	35.04	8.387	7.405	8.128	2.792	2.417	2.693
Trend rate of growth during 1951-94 (% per year)		-0.86	-0.75	-0.88	-1.84	-1.43	-1.79	-2.65	-2.05	-2.56

Note: All poverty measures are expressed as percentages.

**Table 6: Poverty in India 1951-1992: Summary table**

NSS rounds	Period	Rural	Urban	National
Headcount index				
3-8	1951-55	54.77	42.70	52.66
9-15	1956-60	53.96	47.06	52.74
16-19	1961-65	48.59	45.46	48.02
20-24	1966-70	60.44	50.90	58.60
25, 27, 28	1971-75	55.27	46.04	53.39
32, 38	1976-83	47.96	38.08	45.68
42-45	1984-90	37.94	34.99	37.20
46-48	1991-92	39.44	33.24	37.84
Percentage change between 1951-55 and 1991-92		-28.0	-22.2	-28.1
Poverty gap index				
3-8	1951-55	19.688	14.044	18.701
9-15	1956-60	17.909	15.357	17.457
16-19	1961-65	14.278	14.038	14.233
20-24	1966-70	19.795	16.083	19.078
25, 27, 28	1971-75	17.009	13.457	16.284
32, 38	1976-83	13.837	10.602	13.092
42-45	1984-90	9.255	9.113	9.221
46-48	1991-92	9.468	8.582	9.237
Percentage change between 1951-55 and 1991-92		-51.9	-38.9	-50.6
Squared poverty gap index				
3-8	1951-55	9.421	6.195	8.857
9-15	1956-60	7.941	6.690	7.720
16-19	1961-65	5.734	5.853	5.755
20-24	1966-70	8.672	6.759	8.303
25, 27, 28	1971-75	7.081	5.282	6.713
32, 38	1976-83	5.449	4.042	5.126
42-45	1984-90	3.242	3.244	3.243
46-48	1991-92	3.230	3.105	3.197
Percentage change between 1951-55 and 1991-92		-65.7	-49.9	-63.9

**Table 7: Number of poor in India: 1951-1992**

NSS rounds	Period	Number of poor (million)		
		Rural	Urban	National
3-8	1951-55	170.6	28.1	198.7
9-15	1956-60	184.6	34.8	219.5
16-19	1961-65	183.0	38.6	221.6
20-24	1966-70	251.0	50.7	301.7
25, 27, 28	1971-75	252.2	54.6	306.8
32, 38	1976-83	246.0	58.1	304.1
42-45	1984-90	222.3	67.7	290.0
46-48	1991-92	249.5	73.3	322.8
Percentage change between 1951-55 and 1991-92		46.2	160.7	62.4



**Table 9: Share of the urban sector in poverty (with corrected CPIAL)**

NSS survey period	Mid-point of the survey period	Percentage share of the urban sector in			
		Population	Headcount index	Poverty gap index	Squared poverty gap index
Aug 51-Nov 51	1951.75	17.33	13.57	12.70	11.84
Apr 52-Sep 52	1952.50	17.38	14.97	13.56	12.15
Dec 52-Mar 53	1953.08	17.42	14.94	14.64	14.25
May 53-Sep 53	1953.54	17.45	14.31	13.32	12.72
Oct 53-Mar 54	1954.00	17.48	14.72	14.27	13.78
Jul 54-Mar 55	1954.88	17.54	13.27	11.81	10.68
May 55-Nov 55	1955.63	17.59	15.32	14.50	13.43
Dec 55-May 56	1956.17	17.63	16.04	15.43	14.72
Aug 56-Feb 57	1956.88	17.68	15.80	16.70	17.70
Mar 57-Aug 57	1957.42	17.71	14.49	13.93	13.49
Sep 57-May 58	1958.04	17.76	15.75	15.34	14.68
Jul 58-Jun 59	1959.00	17.82	15.42	14.39	13.91
Jul 59-Jun 60	1960.00	17.89	17.39	18.41	19.35
Jul 60-Aug 61	1961.08	17.97	17.72	18.23	18.75
Sep 61-Jul 62	1962.13	18.15	16.98	18.35	20.15
Feb 63-Jan 64	1963.58	18.42	17.26	17.78	17.56
Jul 64-Jun 65	1965.00	18.69	17.28	17.89	18.18
Jul 65-Jun 66	1966.00	18.88	17.61	17.89	17.61
Jul 66-Jun 67	1967.00	19.07	16.07	15.25	14.47
Jul 67-Jun 68	1968.00	19.27	16.55	15.63	14.88
Jul 68-Jun 69	1969.00	19.46	16.80	16.53	16.22
Jul 69-Jun 70	1970.00	19.66	16.69	16.11	15.65
Jul 70-Jun 71	1971.00	19.86	16.89	16.66	16.31
Oct 72-Sep 73	1973.25	20.57	17.60	16.73	15.68
Oct 73-Jun 74	1974.13	20.86	18.49	17.27	16.18
Jul 77-Jun 78	1978.00	22.20	18.60	18.17	17.58
Jan 83-Dec 83	1983.50	23.89	19.80	19.10	18.74

NSS survey period	Mid-point of the survey period	Percentage share of the urban sector in			
		Population	Headcount index	Poverty gap index	Squared poverty gap index
Jul 86-Jun 87	1987.00	24.71	22.48	22.98	23.15
Jul 87-Jun 88	1988.00	24.95	23.04	24.19	24.12
Jul 88-Jun 89	1989.00	25.19	23.99	25.26	25.21
Jul 89-Jun 90	1990.00	25.44	24.94	27.12	28.70
Jul 90-Jun 91	1991.00	25.68	23.71	25.38	26.93
Jul 91-Dec 91	1991.75	25.87	23.66	25.76	27.42
Jan 92-Dec 92	1992.50	26.05	21.47	22.22	22.78

**Table 10a: Sectoral decomposition of changes in poverty in India: Headcount index, 1951-1992 (percentage points)**

Period		Sources of change in poverty				Total change in poverty
From	To	Change in rural poverty	Change in urban poverty	Inter-sectoral population shift	Covariance term	
Aug 51-Nov 51	Apr 52-Sep 52	-2.893	0.217	-0.0060	0.0024	-2.680
Apr 52-Sep 52	Dec 52-Mar 53	3.586	0.596	-0.0028	-0.0004	4.179
Dec 52-Mar 53	May 53-Sep 53	4.889	0.458	-0.0025	-0.0010	5.343
May 53-Sep 53	Oct 53-Mar 54	5.910	1.248	-0.0035	0.0000	7.155
Oct 53-Mar 54	Jul 54-Mar 55	2.434	-0.652	-0.0067	-0.0039	1.771
Jul 54-Mar 55	May 55-Nov 55	-10.233	-0.398	-0.0092	0.0051	-10.635
May 55-Nov 55	Dec 55-May 56	-2.876	-0.135	-0.0029	0.0010	-3.013
Dec 55-May 56	Aug 56-Feb 57	8.665	1.463	-0.0025	-0.0011	10.125
Aug 56-Feb 57	Mar 57-Aug 57	2.675	-0.454	-0.0027	-0.0021	2.216
Mar 57-Aug 57	Sep 57-May 58	-5.719	-0.200	-0.0056	0.0025	-5.922
Sep 57-May 58	Jul 58-Jun 59	-1.563	-0.531	-0.0048	-0.0007	-2.099
Jul 58-Jun 59	Jul 59-Jun 60	-1.948	0.786	-0.0058	0.0046	-1.163
Jul 59-Jun 60	Jul 60-Aug 61	-4.508	-0.809	-0.0013	0.0007	-5.317
Jul 60-Aug 61	Sep 61-Jul 62	1.477	-0.198	-0.0014	-0.0053	1.272
Sep 61-Jul 62	Feb 63-Jan 64	1.089	0.232	-0.0099	-0.0001	1.311
Feb 63-Jan 64	Jul 64-Jun 65	4.185	0.728	-0.0099	-0.0032	4.900
Jul 64-Jun 65	Jul 65-Jun 66	3.204	0.770	-0.0093	0.0003	3.965
Jul 65-Jun 66	Jul 66-Jun 67	5.435	-0.125	-0.0090	-0.0141	5.287
Jul 66-Jun 67	Jul 67-Jun 68	-0.510	0.128	-0.0234	0.0025	-0.403
Jul 67-Jun 68	Jul 68-Jun 69	-3.770	-0.697	-0.0210	0.0020	-4.487
Jul 68-Jun 69	Jul 69-Jun 70	-1.119	-0.415	-0.0191	-0.0015	-1.555
Jul 69-Jun 70	Jul 70-Jun 71	-2.225	-0.429	-0.0207	0.0012	-2.674
Jul 70-Jun 71	Oct 72-Sep 73	0.417	0.137	-0.0702	0.0012	0.485
Oct 72-Sep 73	Oct 73-Jun 74	0.286	0.471	-0.0286	0.0057	0.734
Oct 73-Jun 74	Jul 77-Jun 78	-4.052	-1.556	-0.1042	-0.0314	-5.744
Jul 77-Jun 78	Jan 83-Dec 83	-4.115	-1.077	-0.1699	0.0074	-5.355
Jan 83-Dec 83	Jul 86-Jun 87	-4.947	-0.325	-0.0799	0.0425	-5.310
Jul 86-Jun 87	Jul 87-Jun 88	0.595	0.336	-0.0108	0.0014	0.921
Jul 87-Jun 88	Jul 88-Jun 89	-0.405	0.237	-0.0095	0.0036	-0.174

Period		Sources of change in poverty				Total change in poverty
From	To	Change in rural poverty	Change in urban poverty	Inter-sectoral population shift	Covariance term	
Jul 88-Jun 89	Jul 89-Jun 90	-3.561	-0.806	-0.0060	0.0038	-4.369
Jul 89-Jun 90	Jul 90-Jun 91	1.588	-0.163	-0.0022	-0.0068	1.416
Jul 90-Jun 91	Jul 91-Dec 91	0.736	0.121	-0.0068	-0.0010	0.849
Jul 91-Dec 91	Jan 92-Dec 92	4.485	0.129	-0.0077	-0.0102	4.597

**Table 10b: Sectoral decomposition of changes in poverty in India: Poverty gap index, 1951-1992 (percentage points)**

Period		Sources of change in poverty				Total change in poverty
From	To	Change in rural poverty	Change in urban poverty	Inter-sectoral population shift	Covariance term	
Aug 51-Nov 51	Apr 52-Sep 52	-1.168	-0.039	-0.0025	0.0006	-1.209
Apr 52-Sep 52	Dec 52-Mar 53	1.366	0.405	-0.0015	0.0003	1.770
Dec 52-Mar 53	May 53-Sep 53	2.263	0.102	-0.0009	-0.0007	2.363
May 53-Sep 53	Oct 53-Mar 54	2.407	0.595	-0.0016	0.0002	3.000
Oct 53-Mar 54	Jul 54-Mar 55	2.554	-0.258	-0.0028	-0.0027	2.291
Jul 54-Mar 55	May 55-Nov 55	-5.441	-0.196	-0.0047	0.0028	-5.638
May 55-Nov 55	Dec 55-May 56	-2.305	-0.230	-0.0014	0.0005	-2.536
Dec 55-May 56	Aug 56-Feb 57	3.133	0.850	-0.0011	0.0005	3.982
Aug 56-Feb 57	Mar 57-Aug 57	1.841	-0.328	-0.0005	-0.0015	1.511
Mar 57-Aug 57	Sep 57-May 58	-2.200	-0.063	-0.0023	0.0010	-2.265
Sep 57-May 58	Jul 58-Jun 59	-1.049	-0.391	-0.0020	-0.0006	-1.442
Jul 58-Jun 59	Jul 59-Jun 60	-2.011	0.371	-0.0027	0.0031	-1.640
Jul 59-Jun 60	Jul 60-Aug 61	-1.386	-0.355	0.0004	-0.0002	-1.741
Jul 60-Aug 61	Sep 61-Jul 62	0.000	-0.010	0.0004	-0.0001	-0.009
Sep 61-Jul 62	Feb 63-Jan 64	0.231	-0.090	0.0005	-0.0021	0.139
Feb 63-Jan 64	Jul 64-Jun 65	1.795	0.359	-0.0016	-0.0007	2.152
Jul 64-Jun 65	Jul 65-Jun 66	1.533	0.295	-0.0016	-0.0006	1.826
Jul 65-Jun 66	Jul 66-Jun 67	3.279	-0.002	-0.0022	-0.0078	3.267
Jul 66-Jun 67	Jul 67-Jun 68	-0.168	0.023	-0.0101	0.0006	-0.155
Jul 67-Jun 68	Jul 68-Jun 69	-2.298	-0.268	-0.0095	0.0028	-2.572
Jul 68-Jun 69	Jul 69-Jun 70	-0.579	-0.238	-0.0067	-0.0010	-0.825
Jul 69-Jun 70	Jul 70-Jun 71	-1.359	-0.190	-0.0078	0.0014	-1.556
Jul 70-Jun 71	Oct 72-Sep 73	0.644	0.022	-0.0228	-0.0049	0.638
Oct 72-Sep 73	Oct 73-Jun 74	-0.137	0.029	-0.0115	0.0009	-0.119
Oct 73-Jun 74	Jul 77-Jun 78	-1.701	-0.400	-0.0480	0.0032	-2.146
Jul 77-Jun 78	Jan 83-Dec 83	-1.848	-0.482	-0.0562	0.0035	-2.383
Jan 83-Dec 83	Jul 86-Jun 87	-2.006	-0.100	-0.0259	0.0183	-2.113
Jul 86-Jun 87	Jul 87-Jun 88	-0.233	0.052	-0.0022	0.0012	-0.183
Jul 87-Jun 88	Jul 88-Jun 89	-0.149	0.057	-0.0010	0.0010	-0.092

Period		Sources of change in poverty				Total change in poverty
From	To	Change in rural poverty	Change in urban poverty	Inter-sectoral population shift	Covariance term	
Jul 88-Jun 89	Jul 89-Jun 90	-1.275	-0.260	0.0001	0.0016	-1.534
Jul 89-Jun 90	Jul 90-Jun 91	0.630	0.001	0.0017	-0.0021	0.631
Jul 90-Jun 91	Jul 91-Dec 91	-0.265	-0.068	-0.0002	0.0002	-0.333
Jul 91-Dec 91	Jan 92-Dec 92	1.922	0.150	-0.0001	-0.0037	2.069

**Table 10c: Sectoral decomposition of changes in poverty in India: Squared poverty gap index, 1951-1992 (percentage points)**

Period		Sources of change in poverty				Total change in poverty
From	To	Change in rural poverty	Change in urban poverty	Inter-sectoral population shift	Covariance term	
Aug 51-Nov 51	Apr 52-Sep 52	-0.683	-0.072	-0.0014	0.0002	-0.756
Apr 52-Sep 52	Dec 52-Mar 53	0.708	0.269	-0.0009	0.0003	0.976
Dec 52-Mar 53	May 53-Sep 53	1.285	0.058	-0.0005	-0.0004	1.342
May 53-Sep 53	Oct 53-Mar 54	0.945	0.254	-0.0009	0.0001	1.198
Oct 53-Mar 54	Jul 54-Mar 55	1.848	-0.125	-0.0015	-0.0017	1.720
Jul 54-Mar 55	May 55-Nov 55	-3.050	-0.110	-0.0028	0.0016	-3.161
May 55-Nov 55	Dec 55-May 56	-1.726	-0.174	-0.0009	0.0004	-1.900
Dec 55-May 56	Aug 56-Feb 57	1.471	0.546	-0.0006	0.0006	2.017
Aug 56-Feb 57	Mar 57-Aug 57	1.242	-0.223	0.0000	-0.0010	1.018
Mar 57-Aug 57	Sep 57-May 58	-1.010	-0.044	-0.0012	0.0004	-1.055
Sep 57-May 58	Jul 58-Jun 59	-0.737	-0.200	-0.0012	-0.0002	-0.938
Jul 58-Jun 59	Jul 59-Jun 60	-1.441	0.156	-0.0014	0.0018	-1.284
Jul 59-Jun 60	Jul 60-Aug 61	-0.490	-0.165	0.0005	-0.0002	-0.655
Jul 60-Aug 61	Sep 61-Jul 62	-0.179	0.039	0.0005	0.0008	-0.138
Sep 61-Jul 62	Feb 63-Jan 64	0.141	-0.158	0.0020	-0.0028	-0.018
Feb 63-Jan 64	Jul 64-Jun 65	0.910	0.223	-0.0008	0.0002	1.133
Jul 64-Jun 65	Jul 65-Jun 66	0.814	0.112	-0.0004	-0.0008	0.924
Jul 65-Jun 66	Jul 66-Jun 67	1.953	0.039	-0.0012	-0.0042	1.986
Jul 66-Jun 67	Jul 67-Jun 68	-0.128	0.006	-0.0055	0.0004	-0.127
Jul 67-Jun 68	Jul 68-Jun 69	-1.362	-0.131	-0.0051	0.0020	-1.496
Jul 68-Jun 69	Jul 69-Jun 70	-0.351	-0.132	-0.0032	-0.0005	-0.487
Jul 69-Jun 70	Jul 70-Jun 71	-0.748	-0.101	-0.0037	0.0008	-0.852
Jul 70-Jun 71	Oct 72-Sep 73	0.425	-0.017	-0.0103	-0.0044	0.393
Oct 72-Sep 73	Oct 73-Jun 74	-0.159	-0.009	-0.0061	0.0005	-0.173
Oct 73-Jun 74	Jul 77-Jun 78	-0.848	-0.145	-0.0256	0.0051	-1.013
Jul 77-Jun 78	Jan 83-Dec 83	-0.946	-0.215	-0.0258	0.0042	-1.183
Jan 83-Dec 83	Jul 86-Jun 87	-0.868	-0.039	-0.0106	0.0081	-0.910
Jul 86-Jun 87	Jul 87-Jun 88	-0.225	-0.036	-0.0007	0.0004	-0.261
Jul 87-Jun 88	Jul 88-Jun 89	-0.083	0.010	-0.0004	0.0004	-0.072

Period		Sources of change in poverty				Total change in poverty
From	To	Change in rural poverty	Change in urban poverty	Inter-sectoral population shift	Covariance term	
Jul 88-Jun 89	Jul 89-Jun 90	-0.536	-0.064	0.0000	0.0011	-0.599
Jul 89-Jun 90	Jul 90-Jun 91	0.262	0.021	0.0011	-0.0007	0.283
Jul 90-Jun 91	Jul 91-Dec 91	-0.183	-0.056	0.0004	0.0000	-0.239
Jul 91-Dec 91	Jan 92-Dec 92	0.838	0.075	0.0004	-0.0015	0.911



**Table 11: Growth and redistribution components of changes in national poverty with correction for CPIAL: 1951-1991 (percentage points)**

Change over the period		Headcount index			Poverty gap index			Squared poverty gap index		
From	To	Growth component	Redistribn. component	Total change in poverty	Growth component	Redistribn. component	Total change in poverty	Growth component	Redistribn. component	Total change in poverty
Aug 51-Nov 51	Apr 52-Sep 52	-2.285	-0.395	-2.680	-0.962	-0.247	-1.209	-0.585	-0.172	-0.756
Apr 52-Sep 52	Dec 52-Mar 53	4.059	0.119	4.179	1.771	-0.002	1.770	0.992	-0.016	0.976
Dec 52-Mar 53	May 53-Sep 53	6.597	-1.253	5.343	3.011	-0.649	2.363	1.673	-0.331	1.342
May 53-Sep 53	Oct 53-Mar 54	5.187	1.967	7.155	2.517	0.484	3.000	1.438	-0.240	1.198
Oct 53-Mar 54	Jul 54-Mar 55	0.411	1.361	1.771	0.486	1.804	2.291	0.316	1.404	1.720
Jul 54-Mar 55	May 55-Nov 55	-7.573	-3.063	-10.635	-4.363	-1.275	-5.638	-2.536	-0.625	-3.161
May 55-Nov 55	Dec 55-May 56	-4.532	1.518	-3.013	-2.295	-0.241	-2.536	-1.447	-0.453	-1.900
Dec 55-May 56	Aug 56-Feb 57	10.643	-0.517	10.125	5.394	-1.413	3.982	2.972	-0.954	2.017
Aug 56-Feb 57	Mar 57-Aug 57	1.378	0.838	2.216	0.714	0.797	1.511	0.394	0.624	1.018
Mar 57-Aug 57	Sep 57-May 58	-3.656	-2.266	-5.922	-1.944	-0.322	-2.265	-1.104	0.049	-1.055
Sep 57-May 58	Jul 58-Jun 59	-2.845	0.745	-2.099	-1.397	-0.046	-1.442	-0.778	-0.161	-0.938
Jul 58-Jun 59	Jul 59-Jun 60	-0.316	-0.846	-1.163	-0.112	-1.527	-1.640	-0.054	-1.230	-1.284
Jul 59-Jun 60	Jul 60-Aug 61	-4.939	-0.379	-5.317	-2.197	0.456	-1.741	-1.125	0.471	-0.655
Jul 60-Aug 61	Sep 61-Jul 62	1.391	-0.119	1.272	0.606	-0.615	-0.009	0.320	-0.459	-0.138
Sep 61-Jul 62	Feb 63-Jan 64	3.185	-1.875	1.311	1.509	-1.370	0.139	0.737	-0.756	-0.018
Feb 63-Jan 64	Jul 64-Jun 65	4.710	0.190	4.900	1.958	0.193	2.152	0.976	0.156	1.133
Jul 64-Jun 65	Jul 65-Jun 66	3.692	0.272	3.965	1.758	0.067	1.826	0.914	0.010	0.924
Jul 65-Jun 66	Jul 66-Jun 67	6.174	-0.886	5.287	3.210	0.056	3.267	1.737	0.250	1.986
Jul 66-Jun 67	Jul 67-Jun 68	-0.001	-0.401	-0.403	0.222	-0.377	-0.155	0.159	-0.286	-0.127
Jul 67-Jun 68	Jul 68-Jun 69	-6.318	1.832	-4.487	-3.486	0.913	-2.572	-1.954	0.459	-1.496

Change over the period		Headcount index			Poverty gap index			Squared poverty gap index		
From	To	Growth component	Redistribn. component	Total change in poverty	Growth component	Redistribn. component	Total change in poverty	Growth component	Redistribn. component	Total change in poverty
Jul 68-Jun 69	Jul 69-Jun 70	-1.187	-0.367	-1.555	-0.570	-0.254	-0.825	-0.300	-0.186	-0.487
Jul 69-Jun 70	Jul 70-Jun 71	-1.507	-1.167	-2.674	-0.754	-0.802	-1.556	-0.389	-0.463	-0.852
Jul 70-Jun 71	Oct 72-Sep 73	-1.083	1.567	0.485	-0.461	1.099	0.638	-0.238	0.631	0.393
Oct 72-Sep 73	Oct 73-Jun 74	3.632	-2.898	0.734	1.567	-1.686	-0.119	0.783	-0.957	-0.173
Oct 73-Jun 74	Jul 77-Jun 78	-8.982	3.238	-5.744	-3.932	1.787	-2.146	-1.981	0.969	-1.013
Jul 77-Jun 78	Jan 83-Dec 83	-4.707	-0.647	-5.355	-1.928	-0.455	-2.383	-0.922	-0.261	-1.183
Jan 83-Dec 83	Jul 86-Jun 87	-6.315	1.005	-5.310	-2.486	0.372	-2.113	-1.124	0.214	-0.910
Jul 86-Jun 87	Jul 87-Jun 88	0.951	-0.029	0.921	0.389	-0.572	-0.183	0.164	-0.425	-0.261
Jul 87-Jun 88	Jul 88-Jun 89	0.418	-0.592	-0.174	0.196	-0.289	-0.092	0.090	-0.163	-0.072
Jul 88-Jun 89	Jul 89-Jun 90	-3.170	-1.200	-4.369	-1.092	-0.442	-1.534	-0.504	-0.095	-0.599
Jul 89-Jun 90	Jul 90-Jun 91	2.588	-1.172	1.416	0.820	-0.190	0.631	0.377	-0.093	0.283
Jul 90-Jun 91	Jul 91-Dec 91	-1.231	2.079	0.849	-0.730	0.398	-0.333	-0.347	0.108	-0.239
Jul 91-Dec 91	Jan 92-Dec 92	5.102	-0.508	4.594	1.845	0.223	2.068	0.793	0.118	0.912

## **Annex A: An Alternative Estimate of Durables and Miscellaneous Expenditure by the Top Expenditure Group for NSS 32nd Round (1977-78)**

As discussed in section 2.3, the reported per capita expenditure, for the 32nd round of the NSS (1977-78), on durables and miscellaneous goods and services (hereafter DMGS) by the top expenditure group appears to have been over-stated, particularly for the rural sector. This is apparent from Figures A1 and A2, which show an unusually large outward shift of the rural concentration curve for DMGS for 1977-78 compared to the preceding and succeeding rounds of the NSS. The rural concentration index for this category of expenditure was 66 per cent in 1977-78 as against 53.2 per cent in 1973-74 and 48.5 per cent in 1983 (see Table A1). While no clear explanation for this is to be found in the NSS published reports, some form of corrective action seems warranted.

The correction we propose is based on the concentration curves for this category of expenditure from the preceding and the succeeding rounds (for 1973-74 and 1983 respectively). The basic idea is the following. We estimate what the top fractile group's expenditure on DMGS in 1977-78 would have been had the 1973-74 concentration curve for this category of expenditure also applied to 1977-78. Similarly, we obtain a second estimate using the 1983 concentration curve. We then take a simple average of the two estimates. Our procedure assumes that the top fractile group's expenditure on all other items has been correctly reported. Adding to the expenditure on all other items our estimate of expenditure on DMGS, we also obtain a revised estimate of total per capita expenditure of the top fractile group, which in turn leads to a revised *mean* per capita (total) expenditure for all expenditure groups. More formally, our procedure is set out as follows.

If  $x_1^D$  is the per capita expenditure on DMGS of the top fractile group and  $x_0^D$  is the per capita expenditure on DMGS of the rest of the population, and their shares in total population are  $1-p_0$  and  $p_0$  respectively, then the corrected per capita expenditure on DMGS of the top fractile group,  $x_1^{*D}$ , is estimated in two steps. We first estimate the new mean per capita expenditure on DMGS for all expenditure classes (denoted  $\mu^{*D}$ ) using the new (corrected) share of the bottom  $p_0$  percent of the population in total expenditure

on DMGS (denoted  $L_0^{*D} = L^D(p_0)$ ). This share is the predicted share of  $p_0$  using the estimated

$$\mu^{*D} = (p_0 x_0^D) / L_0^{*D}$$

concentration curve for 1973-74. Thus,

Then, noting the fact that  $\mu^{*D}$  is a population-share weighted sum of  $x_0^D$  and  $x_I^{*D}$ , we construct an estimate

$$x_I^{*D} = \frac{\mu^{*D} (1 - L_0^{*D})}{(1 - p_0)}$$

of  $x_I^{*D}$  using

A similar estimate is derived from the 1983 concentration curve, and we then average the two estimates of  $x_I^{*D}$  to obtain the final adjusted figure. The adjusted DMGS expenditure by the top fractile group in rural areas is about 32% of the published figure.

To be consistent, we also made a similar adjustment for the urban sector, though the urban expenditures on DMGS for 1977-78 appear to relatively less problematic when compared with other rounds. The adjusted DMGS expenditure by the top fractile group in the urban sector is about 70% of the unadjusted level.

**Table A1: Correcting DMGS expenditures for 1977-78 (NSS 32nd round)**

	Unadjusted value for 1977-78	Adjusted value for 1977-78 using concentration curve for		
		1973-74	1983	Average
Rural				
Share of the top 1.74% in total expenditure on DMGS (%): $1 - L_0^D$ and $1 - L_0^{*D}$	40.4	19.0	16.7	17.9
Concentration index for DMGS (%)	65.98	53.23*	48.50*	
Per capita exp. on DMGS of the bottom 98.26% (Rs. per month): $x_0^D$	7.24			
Mean per capita exp. on DMGS by all exp. classes (Rs. per month): $\mu^D$ and $\mu^{*D}$	11.94	8.78	8.54	8.66
Per capita exp. on DMGS of the top 1.74% (Rs. per month): $x_1^D$ and $x_1^{*D}$	277.48	95.85	82.06	88.96
Per capita total exp. of the top 1.74% (Rs. per month)	495.48	313.85	300.06	306.96
Mean per capita total exp. of all expenditure classes (Rs. per month)	69.10	65.94	65.70	65.82
Urban				
Share of the top 2.03% in total expenditure on DMGS (%): $1 - L_0^D$ and $1 - L_0^{*D}$	23.4	19.3	15.8	17.6
Concentration index for DMGS (%)	55.28	52.96*	49.24*	
Per capita exp. on DMGS of the bottom 97.97% (Rs. per month): $x_0^D$	17.67			
Mean per capita exp. on DMGS by all exp. classes (Rs. per month): $\mu^D$ and $\mu^{*D}$	22.60	21.44	20.56	21.00
Per capita exp. on DMGS of the top 2.03% (Rs. per month): $x_1^D$ and $x_1^{*D}$	260.63	203.48	160.09	181.79
Per capita total exp. of the top 2.03% (Rs. per month)	550.60	493.45	450.06	471.76
Mean per capita total exp. of all expenditure classes (Rs. per month)	100.00	98.84	97.96	98.40

Note: \* These are the actual concentration indices for 1973-74 and 1983 respectively, calculated from the estimated concentration curves for these years.

## Annex B: Forecasting the CPIAL for the Early 1950s

As noted in the section 2.4, the official CPIAL statistics are available only for the period since September 1956, so that we are left with the problem of finding a suitable rural cost of living index for the earlier NSS rounds (3 through 10), in particular for the period August 1951 to August 1956. Our approach here has been to estimate the CPIAL for this period by exploiting its close relationship with two other price indices, *viz.*, the CPIIW and the Wholesale Price Index (WPI), that are observed over the entire period (see Fig. B1). We thus estimated the following model for the CPIAL, using 32 years of monthly data covering the

$$\begin{aligned} \Delta \ln(CPIAL)_t = & a_0 + \alpha_0 \Delta \ln(CPIIW)_t + \alpha_1 \Delta \ln(CPIIW)_{t-1} + \beta_0 \Delta \ln(WPI)_t \\ & + \beta_1 \Delta \ln(WPI)_{t-1} + \sum_{j=1}^{11} \gamma_j M_{jt} + \delta_1 D_{1t} + \delta_2 D_{2t} + \varepsilon_t \end{aligned}$$

period September 1956 to September 1988:

where  $\Delta \ln(CPIAL)$ ,  $\Delta \ln(CPIIW)$  and  $\Delta \ln(WPI)$  are the first differences of the natural logs of the three price indices,  $M_i$  are dummy variables for the months January through November,  $D_1$  and  $D_2$  are dummy variables for the period September 1964 - July 1968 and August 1968 - September 1988 respectively. These two periods correspond to the change in the base periods of the two consumer price indices.<sup>1</sup> A new series of the CPIAL with July 1960 - June 1961 as the base started from September 1964 replacing the earlier interim

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<sup>1</sup> The revised series have typically involved both the use of a more recent weighting diagram and a larger coverage of commodities and price quotations. We have used the published link factors to convert the series to a common base period.

series with July 1950 - June 1951 as its base, and since August 1968 a new series of CPIIW with base year 1960 replaced the existing Consumer Price Index for the Working Class which had 1949 as its base year.<sup>2</sup>

We were led to the first-difference specification of model (B1) after testing for unit roots in the three price series. The augmented Dickey-Fuller (ADF) tests, which suggested the presence of unit roots in these series (in natural logs), are reported in Table B1. Non-stationarity of these series was also indicated by the very slowly declining auto-correlation functions for these series. We also tried higher order lags in  $\Delta \ln(CPIIW)$  and  $\Delta \ln(WPI)$  in model (B1) which turned out to be insignificant.

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<sup>2</sup> There have also been changes in the base of the Wholesale Price Index over this period, most recently involving a move to April 1981 - March 1982 as the base for the index numbers since April 1982. But dummy variables for base period changes in WPI always turned out to be insignificant in specifications of model (B1).

The estimated parameters of model (B1) are shown in Table B2. The Table also gives estimates for an augmented model (B2) which includes the lagged first difference of  $\ln(CPIAL)$  as an additional regressor. We experimented with this specification in view of the serial correlation indicated for model (B1). The diagnostic statistics suggest model (B2) to be a better specification; it controls for first-order serial correlation (insignificant Durbin's  $h$ ), and higher-order auto-correlation is attenuated. As a further alternative (suggested by the auto-correlation function of the residuals of model (B1)), we also estimated a third model (B3) which was the same as model (B1) but with a first-order moving average (MA(1)) specification of the error process. While the MA(1) process is indicated to be significant, the parameter estimates for this model are very close to those for model (B1). We also looked at the auto-correlation functions of the residuals from these three models. Two observations can be made on the auto-correlation functions: (i) in all cases the auto-correlation coefficients are relatively low, and (ii) the auto-correlation functions are quite similar in all three cases.<sup>3</sup>

However, the main problem with model (B2) turned out to be that, when inverted for back-ward forecasting, it led to explosive predictions of the CPIAL for the pre-sample period. On the other hand, the forecasts from models (B1) and (B3) turned out to be virtually identical. These forecasts, averaged over the relevant NSS survey periods, are shown in Table B3. As the data in columns 5 and 6 show, there is little to choose between these two forecasts. We opted to stay with forecasts based on model (B1).

Model (B1) tracks the data on CPIAL quite well; see Fig. B2 which compares the dynamic forecast and actual values of the CPIAL both over the estimation period (September 1956 through September 1988) as also the post-sample period (October 1988 through September 1991). The monthly forecasts for the pre-sample period, August 1951 through August 1956, are shown in Fig. B3, which also plots the 95% confidence

$$(\sigma_{t-1}^f)^2 = (\sigma_t^f)^2 + \hat{\sigma}_\varepsilon^2 X_t (XX)^{-1} X_t'$$

interval around the forecasts. This confidence interval is constructed using the recursion:

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<sup>3</sup> The third model (model (B1) with MA(1) errors) yields lower values of the Box-Pierce statistic suggesting a somewhat better approximation of a white noise process, although for higher lag lengths (more than 20 periods) the Box-Pierce statistics are significant for all three models.



where  $(\sigma_t^f)^2 = \text{var} [ \ln(\text{CPIAL})_t^f ]$ ,  $X_t$  is a row vector of the t-th realization of the right hand side variables of model (B1),  $\hat{\sigma}_\varepsilon$  is the standard error of the estimate,  $t$  goes from September 1956 .. August 1951, and  $(\sigma_t^f)^2 = 0$  for  $t = \text{September 1956}$  (the initial value of the CPIAL is taken as given). The 95%

$$\ln(\text{CPIAL})_t^f \pm 1.96 \sigma_t^f$$

confidence interval is then obtained using

This confidence interval for the period August 1951 through August 1956 is graphed in Fig. B3. As expected, the interval of course widens as we move farther back in time. But even at the beginning of our period, the interval forms only a narrow band around the CPIAL forecasts. In Fig. B4, we also plot monthly forecasts of the CPIAL along with the observed values of the CPIIW and the WPI; all price indices tend to move together, as also conjectured in the *Report on the Pattern of Consumer Expenditure: Second to Seventh Round* (GOI 1959, p. 12; see Table 1).

For our purpose, we need average values of the CPIAL over the survey periods of NSS rounds 3 through 11. This averaging over months can be expected to further dampen the forecast error associated with the estimated CPIAL for any particular NSS round. Table B3 gives the average CPIAL forecasts and the corresponding observed values of the CPIIW and WPI for these NSS rounds. As expected, the forecast CPIAL broadly follows the movements in the other two indices. The Table also shows the 95% confidence interval for the CPIAL for each NSS round.

Finally, we also evaluate the corresponding confidence interval for the estimated poverty measures for these NSS rounds. The interval for the headcount index is shown in Table B4; the range is of similar magnitude for other poverty measures. The confidence interval though predictably wider for the earlier rounds is nevertheless found to be quite narrowly demarcated.

**Table B1: Unit root tests on the consumer price index series (Sep 1956-Sep 1988)**

	<i>ln</i> (CPIAL)	<i>ln</i> (CPIIW)	<i>ln</i> (WPI)
DF	-1.862	-2.030	-2.520
ADF(1)	-3.426	-2.944	-3.131
ADF(2)	-3.429	-3.064	-3.134
ADF(3)	-3.407	-3.208	-3.384
ADF(4)	-2.940	-2.714	-3.074
ADF(5)	-2.841	-2.460	-2.861
ADF(6)	-2.694	-2.267	-2.757
ADF(7)	-2.877	-2.376	-2.718
ADF(8)	-3.080	-2.710	-2.704
ADF(9)	-3.259	-3.022	-3.070
ADF(10)	-3.800	-3.472	-3.344
ADF(11)	-4.852	-3.811	-3.933
ADF(12)	-5.012	-4.396	-4.189

$$\Delta Y_t = a_0 + a_1 t + a_2 Y_{t-1} + \sum_{j=1}^m b_j \Delta Y_{t-j} + \varepsilon_t$$

Note: The ADF(m) test-statistic for a series  $Y_t$  is based on the t-ratio of  $a_2$  in the following regression  
For  $m=0$ , the DF statistic is obtained. The critical value at 5 % level of significance for 384 observations is -3.423 (MacKinnon 1991). For all three series, the test-statistics in most cases imply a non-rejection of the null hypothesis of unit roots.

**Table B2: Estimated models for  $\Delta \ln(\text{CPIAL})$**

	Model B1		Model B2		Model B3	
	Parameter estimate	T-ratio	Parameter estimate	T-ratio	Parameter estimate	T-ratio
Constant	-0.00859	-4.25	-0.00783	-3.91	-0.00853	-4.18
$\Delta \ln(\text{CPIAL})-1$			0.17759	3.83		
$\Delta \ln(\text{CPIIW})$	0.53577	6.94	0.49367	6.44	0.50321	6.94
$\Delta \ln(\text{CPIIW})-1$	0.44441	6.04	0.3187	3.95	0.44111	6.04
$\Delta \ln(\text{WPI})$	0.31233	5.12	0.33692	5.58	0.34251	5.12
$\Delta \ln(\text{WPI})-1$	0.1648	2.67	0.11165	1.79	0.17773	2.67
M1	0.00965	3.72	0.00999	3.92	0.00936	3.72
M2	0.01129	4.28	0.01090	4.19	0.01111	4.28
M3	0.00993	3.90	0.00878	3.48	0.00984	3.90
M4	0.00184	0.69	0.00107	0.41	0.00168	0.69
M5	0.00405	1.49	0.00478	1.78	0.00391	1.49
M6	0.00465	1.68	0.00444	1.63	0.00456	1.68
M7	0.01278	4.57	0.01211	4.40	0.01262	4.57
M8	0.01089	4.03	0.00842	3.08	0.01074	4.03
M9	0.00890	3.42	0.00668	2.54	0.00905	3.42
M10	0.00684	2.66	0.00535	2.09	0.00705	2.66
M11	0.00179	0.71	0.00133	0.54	0.00197	0.71
D1	-0.00047	-0.27	-0.00065	-0.37	-0.00055	-0.27
D2	-0.00213	-1.77	-0.00187	-1.58	-0.00217	-1.77
MA(1) coefficient					0.2151	4.32
$R^2$	0.7118		0.72325		0.7252	
Adjusted $R^2$	0.6984		0.70956		0.7117	
S.E. of regression	0.0098		0.00966		0.0096	
Mean $\ln(\text{CPIAL})$	5.4712		5.4712		5.4712	
DW	1.554		1.929		1.981	
Durbin's h	38.67		1.651			
AR(12)	0.44		26.99			
RESET(1)	62.78		0.35			
NORM(2)	1.7		47.99			
HET(1)			2.58			

Note: The test statistics are asymptotically distributed as Chi-square with degrees of freedom as indicated in parentheses.

**Table B3: Forecasts of CPIAL for NSS rounds 3 through 11 (October 1973 - June 1974 = 100)**

NSS round	Survey period	CPIIW	WPI	CPIAL Forecast from model (A3)	CPIAL Forecast from model (A1)	95% confidence interval for CPIAL forecasts from model (A1)	
						Upper bound	Lower bound
3	Aug 51-Nov 52	31.78	32.97	36.23	36.07	37.55	34.64
4	Apr 52-Sep 52	30.94	28.68	32.02	32.05	33.17	30.97
5	Dec 52-Mar 53	30.91	28.63	31.70	31.72	32.75	30.72
6	May 53-Sep 53	32.93	31.14	34.66	34.65	35.71	33.62
7	Oct 53-Mar 54	31.33	29.28	32.24	32.24	33.15	31.35
8	Jul 54-Mar 55	29.62	27.64	29.07	29.09	29.76	28.44
9	May 55-Nov 55	28.81	26.19	26.84	26.90	27.36	26.45
10	Dec 55-May 56	30.10	27.93	28.47	28.50	28.83	28.17
11	Aug 56-Feb 57	32.68	30.82	32.52	32.53	32.55	32.50

**Table B4: Headcount index with alternative forecasts of the CPIAL for NSS rounds 3 through 11**

NSS round	Survey period	Headcount index with CPIAL from model (A1)	Headcount index with 95% upper bound of CPIAL from model (A1)	Headcount index with 95% lower bound of CPIAL from model (A1)
3	Aug 51-Nov 52	48.82	51.53	46.06
4	Apr 52-Sep 52	45.33	47.70	42.98
5	Dec 52-Mar 53	49.76	52.11	47.45
6	May 53-Sep 53	55.71	57.94	53.50
7	Oct 53-Mar 54	62.75	64.65	60.84
8	Jul 54-Mar 55	65.54	66.89	64.15
9	May 55-Nov 55	53.28	54.45	52.15
10	Dec 55-May 56	49.8	50.56	48.98
11	Aug 56-Feb 57	60.48	60.49	60.38

## **Annex C: On the Choice of Consumer Price Indices and Adjustment for the Price of Firewood**

Recently, there has been some debate on the choice of appropriate cost of living indices for poverty assessment in rural and urban sectors. Following the initial work of Minhas et. al (1987), new consumer price indices have been developed for the middle rural and urban population (hereafter denoted CPIMR and CPIMU). These indices, it has been argued, provide better measures of sectoral changes in the cost of living for the purposes of poverty monitoring. In the course of a number of papers, the CPIMR and CPIMU indices have now been constructed for the NSS surveys for 1970-71, 1972-73, 1977-78, 1983, 1986-87, 1987-88 and 1988-89. Table C1 compares these new indices with the CPIAL and CPIIW indices that we have used in this paper. For the urban sector, the two indices turn out to be very similar; however, the rate of inflation in the rural sector implied by the CPIMR is significantly higher than that implied by the (unadjusted) CPIAL. This has obvious implications for estimates of rural poverty, as has indeed been pointed out in several papers that have used these indices.

There are three main reasons why the CPIMR indices diverge from the CPIAL indices: (i) the use of different weighting diagrams, (ii) the use of different base periods, and (iii) corrections to the price relative for firewood as used in the CPIAL. In our view, choices pertaining to (i) and (ii) are likely to remain contentious, but (iii) does provide serious grounds for seeking appropriate modifications to the official CPIAL indices. We discuss this in greater detail below.

### *i) Weighting diagram*

Both the CPIAL and the CPIMR are Laspeyres-type price indices, which can be written as fixed-weight indices of price relatives, where the weights are given by budget shares of a reference group of households at a given reference date. For the CPIAL, the reference group comprises agricultural labor households in 1956-57, whose budget shares are derived from the Second Agricultural Labour Enquiry for 1956-57. For the CPIMR, the reference group is middle group of rural households in 1970-71, whose budget shares are taken from the NSS 25th round for 1970-71 (Minhas and Jain 1989). The middle group refers to households within the monthly per capita expenditure classes Rs. 28-34 and 34-43 (more on this below). The two sets of weights are shown in Table C2. Several arguments have been advanced why the CPIMR weights

may be preferred over the CPIAL weights: (i) agricultural labor households are a subset of the poor, and hence their expenditure pattern does not represent that of the rural poor, (ii) since the rural headcount index for the commonly used poverty lines has historically been within the 30-60 percent range, the expenditure pattern of the middle group provides a better yardstick for assessing changes in the cost of living for poverty monitoring, and (iii) the 1956-57 weighting diagram is too old to adequately represent even the expenditure pattern of agricultural labor households.

We do not find these arguments very persuasive. As for (i), by a number of assessments, agricultural labor households (ALH) account for 60-70 per cent of the poor, which is still a larger proportion of the poor than the middle group. Argument (ii) is too fixated on the headcount index as a measure of poverty, which is in fact one of the worst measures as it is insensitive to the depth and severity of poverty; indeed the CPIMR weights are biased in favor of the relatively better off amongst the poor and some of the non-poor. In Table C2, we compare the CPIAL and CPIMR weights with the budget shares of different expenditure groups in the NSS 25th round for 1970-71 (NSS Report 231). The CPIMR weights are virtually the same as the combined budget shares of households with nominal monthly per capita expenditure in 1970-71 within the range Rs. 28-43. This interval accounts for 33% of the rural population, roughly corresponding to the 43rd to the 76th percentile of the population ranked by nominal per capita expenditure. On the other hand, we find that the CPIAL weights reasonably approximate the budget shares of the Rs. 0-28 expenditure group, or the bottom 43 per cent of the population in 1970-71. The expenditure pattern of the bottom 43% is arguably more pertinent to poverty estimation than that of the middle 43-76%.

As for (iii), we produce in Table C2, the expenditure pattern of the agricultural labor households in 1987-88; the latter budget shares are quite different to the CPIAL weights. While we may want to update the CPIAL weighting diagram, it is not clear that updating with the CPIMR weights is the preferred option. What is more relevant is the expenditure pattern of the poor. Data from the 43rd round for 1987-88 indicate that the CPIAL weights are not particularly representative of the poor's expenditure pattern for that year, but neither are the CPIMR weights.

However, our study covers a long period 1951-1992, and for this long period it may not be very useful to have a weighting diagram representative of the poor at the end of the period, but which ceases to be representative of the poor at the beginning of the period. From that point of view, at least (at the all-India

level) the CPIAL weights have the advantage of being representative of the expenditure pattern of the rural poor in 1970-71 which is roughly the middle of the overall period 1951-1992.

ii) *Change in the base period*

This is conceptually different to the change in the weighting diagram. How it matters to the measured change in the cost of living is easily illustrated by a simple two-good two period example. Say, good A's price increases by 50% between period 1 and 2, from 100 (per unit) to 150; good B's price increases by 10% from 150 to 165. The price index assigns equal weights of 0.5 to A and B. Then, the price index in period 1 ( $P_1$ ) is 125, and in period 2 ( $P_2$ ) is 157.5, or setting  $P_1=100$ ,  $P_2$  is 126. Now consider the situation where the base is changed to period 1 but there is no change in the weighting diagram. A's and B's price relatives for period 2 will be 150 and 110, and  $P_2=130$ .

Using the price relatives (with base 1970-71) for the 12 groups of commodities reported in Jain and Minhas (1991), we computed an all-India index for 1983 using the CPIMR and the CPIAL weights. With 1970-71=100, these price indices turned out to be 283.2 and 280.5 respectively. The change in the weighting diagram *per se* makes little difference to the measured changes in the cost of living. These indices are of course considerably higher than the official CPIAL of 266.5 with base 1960-61 (1970-71=100), which suggests that the divergence between the CPIAL and CPIMR (noted in Table C1) is almost entirely due to the change in the base period and the correction for the price of firewood (discussed below). However, there is no compelling reason to change the base of CPIAL series.

iii) *Price of firewood*

The problem with the price of firewood used in the construction of the CPIAL is that the Labour Bureau has used the same price relative of 100 for firewood since 1960-61, on the grounds that most of the firewood consumed by agricultural laborers is obtained in the form of free collection from neighboring forest areas.<sup>4</sup> This is problematic since the NSS consumer expenditure surveys have valued all firewood consumption (including the non-purchased component) at the prevailing local retail prices. The use of the

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<sup>4</sup> This problem with the firewood price was first noted by Minhas et. al. (1987).

uncorrected CPIAL would therefore entail an under-estimation of rural poverty insofar as the price of firewood has been increasing over time. This is a potentially serious issue. Firewood has a non-negligible weight of 6.39 % in the CPIAL, and some adjustment to the official CPIAL series seems called for. The adjustment we make is in two parts, corresponding to the two sub-periods for which different types of data are available.

For the period since August 1969, data on the all-India average rural retail prices of a set of commodities, including firewood, have been published on a monthly basis in the Central Statistical Organisation's journal *Monthly Abstract of Statistics* (MAS).<sup>5</sup> These are based on price data collected regularly by the NSSO. Thus, for the period August 1969-December 1992, the average price of firewood by NSS rounds is obtained as the simple average over months of the NSS survey periods.

For period preceding August 1969, we do not have retail firewood price data. Our procedure for this period involves the assumption that firewood price increased at the same rate as all other items in the Fuel and Light (F&L) component of the CPIAL. Besides firewood, the F&L component also includes kerosene, dungcakes, and matchbox (the combined weight of the latter items within the F&L group is 19.72 %). This seems to a reasonable assumption judging by the stability of the relative price of firewood to kerosene (the other significant item in the F&L group) at least for the period 1969-70 up to about 1973-74.<sup>6</sup> We are thus led

$$P_t^{FL*} = \frac{P_t^{FL} - W_{FL}(100)}{1 - W_{FL}}$$

to the following adjustment:

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<sup>5</sup> Jain (1989) and Minhas et. al. (1991) have used also data from this source to construct their alternative rural price indices for the NSS surveys since 1970-71, though their indices also involve revisions to the base period and the weighting diagram (as discussed above).

<sup>6</sup> Using data on the all-India rural retail prices of these items from the *Monthly Abstract of Statistics*.



where  $P_t^{FL}$  and  $P_t^{FL*}$  are the uncorrected and the corrected price relatives for Fuel and Light, and  $w_F$  is the

$$CPIAL_t^* = CPIAL_t + w_{FL} (P_t^{FL*} - P_t^{FL})$$

share of firewood in the F&L component of the CPIAL. The corrected CPIAL ( $CPIAL^*$ ) is then derived as:

where  $w_{FL}$  is the weight of the F&L group in the CPIAL.

The earliest data on the Fuel and Light component of the CPIAL that we could locate are for the calendar year 1971, published in Chandhok and The Policy Group (1990).<sup>7</sup> Estimates of the F&L indices for the period between 1960-61 and 1969-70 are derived by linear interpolation; the estimates are centered at the mid-point of NSS survey periods. Using these F&L indices, we then apply the above procedure to obtain the corrected CPIAL. Needless to say, resorting to linear interpolation only provides us with approximate corrections. But, in any event, the correction to the CPIAL implied for this period is small. The correction for 1969-70 itself is only of the order of 3.05 points.<sup>8</sup> With lower values of the F&L index prior to 1969-70, the corrections for the earlier years are even smaller.

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<sup>7</sup> The data from this source are available only on an annual basis, although three sets of annual averages of the indices are available, i.e. averages for the calendar year (January to December), the financial year (April to March), and the agricultural year (July to June). The *Indian Labour Journal* started publishing data on different components of the CPIAL only since the 1980s. Our attempts to obtain data on the components of the CPIAL since 1960-61 directly from the Labour Bureau office in Shimla were also unsuccessful.

<sup>8</sup> The uncorrected F&L index (obtained by interpolation) for 1969-70 is 109.4 (with 1960-61=100). The corrected F&L index (using equation C1) is 147.8, which, using (C2) above, yields an upward revision of the CPIAL by 3.05 points, from 192.8 to 195.9.

Having obtained the firewood price index for 1969-70 at 147.8 (1960-61=100; see last footnote), we then use the retail price data from the MAS to construct firewood price indices ( $P_t^{FW}$ ) for the later period.

$$CPIAL_t^* = CPIAL_t + 0.0639 ( P_t^{FW} - 100 )$$

For the period since 1969-70, the corrected CPIAL is then derived:

where the 6.39% is the weight of firewood in the CPIAL.

The revised series of the CPIAL is shown in Table C1. The revised indices are similar to those in the original series up to about 1973-74; for the later period, the revised series indicates significantly higher indices, the divergence increasing over time as the rapidly increasing price of firewood exerts its cumulative effect. The revised CPIAL indices are broadly comparable with the CPIMR indices in Minhas and Jain (1989) and Jain and Tendulkar (1992) over the period covered by these studies.

**Table C1: Alternative Consumer Price Indices for rural and urban sectors**

	CPIMR	CPIAL	CPIAL corrected for the price of firewood	CPIMU	CPIIW
1970-71	67.2	66.0	65.7	68.9	68.1
1972-73	82.0	81.1	80.9	83.5	82.0
1973-74	100.0	100.0	100.0	100.0	100.0
1977-78	117.4	111.2	113.0	120.2	119.4
1983	189.8	175.9	183.3	196.4	194.8
1986-87	225.6	199.0	211.1	252.3	251.8
1987-88	249.8	224.0	236.7	279.5	275.7
1988-89	270.5	249.2	263.0	301.2	299.5

Source: For CPIMR and CPIMU, Jain and Tendulkar (1992) or Tendulkar, Sundaram and Jain (1993).  
For CPIAL and CPIIW, various Labour Bureau publications. For CPIAL corrected for the price of firewood,  
see text.

**Table C2: Alternative weighting diagrams for the rural consumer price index**

Commodity group	CPIAL weights	1970-71 budget shares of the bottom 43.16%	CPIMR weights	1970-71 Budget shares of the middle group: 43.16 to 76.41 percentile
Cereals & substitutes	56.84	54.73	44.8	44.34
Pulses & products	3.94	3.75	4.0	4.01
Milk & milk products	2.53	3.91	8.1	8.22
Edible oils	2.76	3.47	3.7	3.73
Meat, eggs, fish	2.6	2.31	3.1	3.02
Fruits & vegetables	3.32	4.65	4.9	4.81
Sugar	1.95	2.41	3.1	3.19
Spices & salt	3.36	4.19	3.6	3.63
Beverages & refreshments	0.82	2.11	2.5	2.53
Total food	78.12	81.53	77.8	77.46
Pan, tobacco, intoxicants	4.38	3.34	3.3	3.40
Fuel & light	7.96	7.43	6.2	6.25
Clothing & footwear	6.11	3.00	5.7	5.92
Miscellaneous goods & services	3.43	4.71	7.1	6.96
Total non-food	21.88	18.47	22.3	22.54
Total expenditure	100	100.00	100.0	100.00

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