Dynamics of Poverty in India: A Panel Data Analysis

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This paper examines the incidence and dynamics of poverty over a period of three decades from 1970 to the end of the 1990s. We use a national rural panel household data set, based on household surveys conducted by the National Council of Applied Economic Research in three rounds in 1970, 1981 and 1998. It examines the trends in the incidence of poverty in India from a longitudinal perspective. The study corroborates the view that the period of 1990s experienced a slower decline in poverty compared to the previous decade, although the incidence of chronic poverty declined even in the latter period. It also examines the pattern of growth in consumption expenditure to understand how it tracks trends in poverty.

This paper is based on the working paper "Dynamics of Chronic Poverty: Variations in Factors Influencing Entry and Exit of Chronic Poor" (accessible at www.cprc.org). The authors would like to thank Aasha Kapur Mehta for her comments on the previous version of the paper and for encouragement in this research. They would also like to thank Hari Nagarajan for providing access to the data.

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Poverty can be "transitory" or "chronic". The transitory poor are the people who remain poor for a short duration and then move out of poverty. Chronic poverty describes people who are poor for significant periods of their lives, who may pass their poverty onto their children, and for whom finding exit routes from poverty is difficult. The severity of poverty, on the other hand, is a description of the degree of poverty.

The distinction between chronic poverty and transient poverty is not common in the studies on poverty in India. Shepherd and Mehta (2006) presented pioneering work on the concept and measurement of chronic poverty in the Indian context.

Bhide and Mehta (2005) used household panel data for 3,239 households spread across several states of the country at three points of time, i e, 1970-71, 1981-82 and 1998-99, to examine the patterns and movement of rural households across poverty groupings over this three-decade period. They found that there is significant incidence of chronic poverty in rural India. The analysis also showed that the incidence of chronic poverty in the panel data declined from 28.4% (in the period 1970-71 to 1981-82) to 24.27% (in the period 1981-82 to 1998-99). Chronic poverty was defined using the Planning Commission's expenditure poverty line, as measured by the average monthly consumption expenditure.

Determination of poverty as "chronic" or "temporary", defined in terms of duration of the income/expenditure status of households, generally requires that the same households be tracked over time through a panel data set.[1] This study deals with the incidence of poverty at a point of time, and also the movement of households into and out of poverty over time across discrete poverty status categories. We use panel data that longitudinally track households in rural India to provide an initial identification and understanding of the characteristics of households that exhibit mobility out of poverty and of those that simply stay poor.

The paper further presents an analysis of the growth rate of per capita expenditure for the same set of households over time to supplement the understanding of poverty dynamics emerging from the discrete classification of households into "poor" and "non-poor" categories.

The Sample Surveys: 1970-71, 1981-82 and 1998-99

The present analysis is based on the data collected by the National Council of Applied Economic Research (NCAER) through household surveys conducted in three rounds in 1970-71, 1981-82 and 1998-99. The sample survey was conducted in 250 villages, spread over most of the major states of India. The survey of

1970-71 was itself part of a three-year survey and called the "Additional Rural Income Survey" (ARIS). The data for 1981-82 and 1998-99 came from two subsequent rounds of the survey called the Rural Economic and Demographic Survey (REDS). Together, the data sets are referred to as ARIS-REDS.

There have been a number of applications of these data over-time to analyse a range of development issues (for example, Foster and Rosenzweig 2001 and 2007). The initial 1970-71 sample was probabilistic. Later surveys attempted to track the same set of households.

The survey tracked only the male line, of households with the following features: (1) the head of the household in 1970-71 was alive in 1981-82 and the household was intact; (2) the head of the household was alive, but all the members of the household had not stayed together; and (3) the head of the household in 1970-71 was dead in 1981-82 but the rest of the household was intact. The third round covered all the households surveyed in 1981 that were still residing in the village. The procedure for selection was the same as that adopted in 1981-82. For the analysis, the final data set of 3,239 households was established by tracing the households backwards from 1998-99. Splits in the households were replicated in the older data (Bhide and Mehta 2005).

The survey includes information on a number of variables. It includes characteristics of the households like age distribution, the literacy and occupation levels of household members, their health status and socio-economic characteristics, the possession of income-earning assets, landownership and cultivation, and details of consumption expenditure. Village characteristics, such as population and access to infrastructure, are also available.

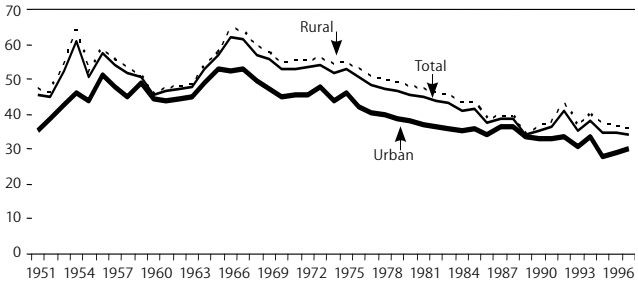
To classify the households as poor or non-poor, we have used survey data on household consumption expenditure and the official poverty line at the state level. The Planning Commission's estimate of the poverty line for the year 1980-81 is adjusted by the Consumer Price Index for Agricultural Labour (CPI-AL) to arrive at the poverty line at 1981-82 prices. The CPI-AL is also used to express the total consumption expenditures of the households in 1970-71 and 1998-99 at 1981-82 prices. The data has been supplemented by selected village and district-level characteristics. Information on the village and district-level variables has been compiled from a number of data sources (Bhide and Mehta 2008).

Trends in Incidence of Rural Poverty

As noted earlier, the panel data analysed in the paper refers to three years: 1970-71, 1981-82 and 1998-99. The survey was done in a panel of villages across the country at these three points in time. In order to provide a context, estimated trends in a few economic indicators pertaining to this period are briefly reviewed below. Trends in estimates of incidence of poverty, based on data provided by National Sample Surveys (NSS), are summarised in Datt (1998) and Jha (2002) and illustrated in Figure 1.

From 1960 until 1966, there was a sharp rise in the incidence of poverty in rural as well as urban areas. From 1966 onwards, there was a gradual decline in rural poverty. Thus, the first year of the panel survey coincided with the period when incidence of poverty was beginning to decline. Incidence of poverty was still at a high level of about 55% of the population in rural areas in 1970. The period from 1970 to 1981 saw a steady decline in poverty. In 1983, the incidence of poverty was estimated to be 45% of the rural population. The incidence of poverty worsened during the period 1990-94. The headcount ratio (HCR) increased and then declined subsequently.

Figure 1: Incidence of Poverty in India: Headcount Ratio (%)



Trends for the intermediate years for which data are not available are based on linear interpolation.
Source: Datt (1998) and Jha (2002).

While the first survey was carried out at a time when the incidence of rural poverty was beginning to decline after a phase of rising HCR, the second survey (1981) was conducted during a period when there had been a steady decline in HCR in the rural areas. The final survey (1998-99) was carried out at a time when a period of worsening of poverty was followed by a declining trend. Thus, all the three surveys were conducted in the context of declining incidence of rural poverty. However, as shown in Table 1, the rate of decline in poverty was faster during the first inter-survey period (1970-81) compared to the second inter-survey period (1981-98).

While the incidence of rural poverty declined at the aggregate level, the annual average rate of growth of per capita output or per capita GDP at constant prices from agriculture and allied sectors actually declined during 1970-1980 (Table 1). The non-agricultural sector registered a small increase in output during the period. However, during the second inter-survey period, output of the agricultural sector increased by 2% per year and the non-agricultural sector's output rose at twice this rate.

Table 1: Trends in Selected Indicators of the Economic Environment and of Poverty

Period	Annual Average Rate of Growth (%) in Per Capita GDP from				Rate of Inflation (%)	Rate of Change in the Incidence of Poverty (Percentage Points Per Year)		
	Agriculture and Allied Sectors	Industry	Services	Total	CPI-AL	Rural	Urban	Total
1960-69	-0.39	4.11	2.64	1.33	6.36	0.67	-0.29	0.48
1970-80	-0.54	1.74	2.20	0.89	7.60	-0.86	-0.35	-0.79
1981-97	2.00	4.47	4.52	3.64	8.50	-0.32	-0.33	-0.32

For incidence of poverty, we have used the estimates for 1963, 1973 and 1993, respectively for the three periods in the table.
Source: Reserve Bank of India (RBI) (2005) for GDP and for the CPI-AL. Datt (1998) and Jha (2002) for the HCRs.

The consumer prices in the rural areas (CPI-AL) increased at a faster rate in the second period as compared to the first. Since the poor are dependent on agriculture for their livelihood, agricultural growth is important for reducing poverty. On the other hand, higher prices of purchased products imply a decrease in their purchasing power, and hence can raise incidence of poverty. Therefore, trends in the incidence of poverty are influenced both by growth and inflation rates. The dynamics of income growth in rural areas are also influenced by a number of other factors such

Table 2: Trends in Poverty Status of Panel Households

Status of Households	Period	Number of House-holds	% with Respect to Total	% of Households with access to			SC hhds as % of Total	ST hhds as % of Total
				Own House	Livestock Income	Irrigated Land		
Severely poor	1970-71	913	28.19	98.69	63.42	20.37	19.50	9.53
	1981-82	742	22.91	98.11	76.82	30.05	16.58	7.95
	1998-99	713	22.01	98.88	61.29	44.04	16.83	6.87
Moderately poor	1970-71	715	22.07	98.46	78.04	36.92	11.19	5.59
	1981-82	563	17.38	98.76	78.51	46.89	14.21	7.28
	1998-99	664	20.50	99.40	66.42	44.28	12.50	7.08
Non-poor	1970-71	1611	49.74	99.38	88.89	57.42	5.71	3.85
	1981-82	1934	59.71	98.66	88.83	58.63	7.60	4.60
	1998-99	1862	57.49	99.62	64.72	46.51	7.89	4.99
Exit from severe poverty	1970-81	362	39.65	98.62	68.78	26.80	16.85	10.77
	1981-98	287	38.68	97.91	80.84	33.10	14.29	9.06
Exit from moderate poverty	1970-81	389	54.41	99.74	82.26	42.42	7.46	2.83
	1981-98	281	49.91	98.58	80.78	51.96	11.03	7.47
Shift from moderate to severe poverty	1970-81	173	24.20	97.69	78.61	25.43	17.34	9.83
	1981-98	168	29.84	98.21	72.62	41.07	19.05	5.36
Entry into moderate poverty	1970-81	241	14.96	100.00	90.87	52.28	7.88	1.24
	1981-98	354	18.30	97.46	87.85	55.37	9.32	6.21

hhds= households.
Source: Authors' calculations from ARIS-REDS data.

as household characteristics, characteristics of the village and the overall environment for economic growth.

Incidence and Mobility of Poverty

The incidence of poverty can also be defined in terms of intensity of poverty. We have defined two levels of intensity: moderate and severe poverty. The cut-off for classification of households into these categories is the monthly per capita consumption expenditure corresponding to the official estimate of the poverty line. Households with monthly consumption expenditure between 75% of the poverty line and the poverty line are called "moderately poor", while those with monthly per capita expenditure less than even 75% of poverty line are termed "severely poor".

An important limitation of the data used in the analysis here, as well as in the previous applications, is that the households may not remain "representative" of the entire population in rural India after the first round or wave of the survey, if the situation in the rural economy across the country changes significantly. However, because of its spread across the country, the sample still covers a large enough canvass of rural India.

Broad trends derived from the sample are illustrated in Table 2.[2] The period from 1970 to 1981 was better for poverty reduction than the latter period of 1981 to 1998, in the sense that the rate of poverty reduction was faster. Within the sample, incidence of poverty declined, as the number of severely poor households fell from 913 (in 1970-71) to 742 (1981-82) and then to 713 (1998-99). The number of moderately poor households increased in the second period (1981-82 to 1998-99) after a decline during 1970 to 1981. Movement out of poverty was higher in the first period. The households exiting moderate and severe poverty were larger in number for the period 1970 to 1981 than for the second period. The number of people entering the moderately poor group was also higher during the second period than during the first, although over a longer intervening period. There has been a small decline in the number of households slipping from moderate to severe poverty in the second period than in the first.

These trends do not seem to be sharply different from what has been observed in the NSS. As shown in Table 1, the decline in the incidence of poverty was faster in the period corresponding to 1970-81 than in the second period (1981-98).

The characteristics of households associated with the different levels of poverty provide important insights. For example, just the "ownership" of the house is not likely to be a major differentiator of the poor and non-poor. A larger proportion of non-poor households have their "own house" compared to the severely poor in all the three waves of the panel. However, in 1981-82, moderately poor households have a slightly higher proportion owning a house than the non-poor (Table 2). In this characterisation, we have not distinguished between types of houses and their value for different households. This is a limitation of the present specification.

Access to livestock income, on the other hand, appears to be a significant differentiator of the poor and non-poor. A relatively larger proportion of households which escaped from severe poverty had income from livestock compared to the overall proportion of the severely poor with livestock. Greater access to irrigated land is also associated with reduction in the incidence of poverty. Socially backward communities, such as the scheduled castes (SCs) and the scheduled tribes (STs) are proportionately greater in number among the poor than the non-poor. The exit rates also appear to be lower for SCs and STs than for the others. The data, therefore, provide important insights into the pattern of changes in poverty status across different types of households.

The data can also be examined to understand the trends in overall measures of poverty for the population represented by the panel. Table 3 provides the Foster-Greer-Thorbecke (FGT) (Jha and Sharma 2003) measures of poverty to describe the extent of poverty among the rural households surveyed. These indices are generally used for country-level data to gauge overall progress in poverty alleviation. The FGT poverty measure for the population is defined as:

$$P_\alpha = \int_0^q \left(\frac{z - y}{z} \right)^\alpha dy$$

Table 3: Foster-Greer-Thorbecke Measures of Poverty

Years	HCR	PGI	SPGI
1970-71	0.5026	0.1537	0.0657
1981-82	0.4029	0.1192	0.0487
1998-99	0.4251	0.1157	0.0438

HCR = Headcount Ratio.
PGI = Poverty Gap Index.
SPGI = Squared Poverty Gap Index.
Source: Authors' calculations from ARIS-REDS data.

Table 4: Transition Matrix of Poverty from 1970 to 1981 (%)

	1981				
1970	SP	MP	MNP	NP	Total
SP	41.84	18.51	15.77	23.88	100
MP	24.20	21.40	20.84	33.57	100
MNP	18.46	18.26	16.80	46.47	100
NP	8.68	13.55	17.27	60.50	100

SP – Severely Poor, MP – Moderately Poor, MNP – Moderately Non-poor, NP – Non-poor.
Source: Authors' calculations from ARIS-REDS data.

Table 5: Transition Matrix of Poverty from 1981 to 1998 (%)

	1998				
1981	SP	MP	MNP	NP	Total
SP	34.91	26.42	18.60	20.08	100
MP	29.84	20.25	20.96	28.95	100
MNP	20.04	24.43	16.34	39.19	100
NP	12.60	15.75	15.16	56.48	100

SP – Severely Poor, MP – Moderately Poor, MNP – Moderately Non-poor, NP – Non-poor.
Source: Authors' calculations from ARIS-REDS data.

Table 6: Transition Matrix of Poverty from 1970 to 1998 (%)

	1998				
1970	SP	MP	MNP	NP	Total
SP	30.34	26.07	16.54	27.05	100
MP	22.52	20.14	18.74	38.60	100
MNP	23.86	19.29	18.67	38.17	100
NP	14.17	16.74	16.03	53.06	100

SP – Severely Poor, MP – Moderately Poor, MNP – Moderately Non-poor, NP – Non-poor.
Source: Authors' calculations from ARIS-REDS data.

Table 7: Distribution of Panel Households: 1970 and 1981 (%)

Poverty Status	1981		
1970	P	NP	Total
P	27.08	23.19	50.26
NP	13.21	36.52	49.74
Total	40.29	59.71	100.00

P – Poor, NP – Non-poor.
Source: Authors' calculations from ARIS-REDS data.

Table 8: Distribution of Panel Households: 1981 and 1998 (%)

Poverty Status	1998		
1981	P	NP	Total
P	22.8	17.5	40.29
NP	19.8	40.0	59.71
Total	42.51	57.49	100.00

P – Poor, NP – Non-poor.
Source: Authors' calculations from ARIS-REDS data.

Table 9: Distribution of Panel Households: 1970 and 1998 (%)

Poverty Status	1998		
1970	P	NP	Total
P	25.3	24.9	50.26
NP	17.2	32.5	49.74
Total	42.51	57.49	100.00

P – Poor, NP – Non-poor.
Source: Authors' calculations from ARIS-REDS data.

Table 10: Transition of Panel Households: 1970 to 1981 (%)

Poverty Status	1981		
1970	P	NP	Total
P	53.9	46.1	100.0
NP	26.6	73.4	100.0
Total	53.9	46.1	100.0

P – Poor, NP – Non-poor.
Source: Authors' calculations from ARIS-REDS data.

where y is real monthly per capita expenditure and z is the poverty line.

The basic measure is the HCR ($\alpha = 0$) which gives the proportion of population below the poverty line. An increase in this implies a worsening of the situation. The poverty gap index (PGI; $\alpha = 1$) measures the depth of poverty based on the aggregate poverty deficit of the poor relative to the poverty line. A decline here reflects an improvement in the situation. The squared poverty gap index (SPGI; $\alpha = 2$) reflects changes in severity of poverty. It gives higher weightage to larger poverty gaps.

These measures calculated from the present survey data are much higher than the national-level estimates given by Deaton and Dreze (2002), Sundaram and Tendulkar (2003) and Jha (2003). Nonetheless, the results show that the depth and severity of poverty declined from 1970 to 1998, with a greater fall in the period 1970 to 1981 than in 1981 to 1998. The HCR in the panel actually increased in the second period, although this is due to the larger number of transient poor during this year. The declines in depth and severity of poverty were also estimated to have occurred in roughly the same period by Jha (2003).

Transition Matrix

A unique contribution of panel data is the information it provides on poverty dynamics. The movement of households into and out of the poverty can be captured through a transition matrix of such movements. Tables 4 to 6 (p 93) provide the rates of movement of households across different poverty status categories. Each cell in the matrix indicates the percentage of households by its status in the two selected years. Consider the following trends:

- A higher proportion of severely poor remained severely poor between 1970 and 1981 (41.84%) as compared to the period between 1981 and 1998 (34.91%).
- Entry into poverty is higher in the latter period as 44% of the moderately non-poor and 28% of the non-poor fall into lower expenditure categories between 1981 and 1998 whereas the corresponding figures for 1970 and 1981 are 37% and 22%, respectively.
- From 1970 to 1998, 57% of moderately poor and 44% of severely poor households moved out of poverty but 43% of moderately non-poor and 31% of non-poor moved down in the expenditure categories.
- Though some of the poverty is transitory in nature, the problem of chronic poverty is significant as 56% of severely poor either remain poor or become poor again, after a period of transitorily moving above poverty line, even after 28 years (1970 to 1998). Forty-three per cent of moderately poor either have the same status or become severely poor over the same period.[3]

The pattern of changes can be looked at in a more aggregated manner in terms of changes taking place across poor and non-poor categories. Is it harder to reduce poverty as overall incidence of poverty declines? In other words, as the overall incidence of poverty reduces, is further reduction difficult to achieve? This is what is now termed as the problem of "hard-core" poverty. According to the Planning Commission (2006), the relative number of the hard-core poor among the poor has increased in recent years. The problem of poverty alleviation, thus, is going to be far more difficult than in the past, since those who were near the poverty line might have crossed it, leaving those far below the line as the hard-core.

We present the nature of changes taking place in the poverty scenario over the period 1970 to 1998 in the present panel in Tables 7-12. Tables 7-12 show that the incidence of chronic poverty in the panel, defined as percentage of households remaining poor in consecutive survey rounds, has declined from 27.06 in 1970-81 to 22.8 during 1981-98. However, some of the households that had escaped poverty during 1970-81 slipped back into poverty during 1981-98 as the percentage of households which were poor in both 1970 and 1998 increased to 25.3 as compared to the 22.8% chronic poor during 1981-98. In other words, not all the exit from poverty is permanent. In fact, 13.21% of households which were non-poor in 1970 became poor in 1981. The percentage is even higher for the next period as 19.8% of households which were non-poor in 1981 became poor in 1998.

Table 11: Transition of Panel Households: 1981 to 1998 (%)

Poverty Status	1998		
1981	P	NP	Total
P	56.5	43.5	100.0
NP	33.1	66.9	100.0
Total	56.5	43.5	100.0

P – Poor, NP – Non-poor.
Source: Authors' calculations from ARIS-REDS data.

Table 12: Transition of Panel Households: 1970 to 1998 (%)

Poverty Status	1998		
1970	P	NP	Total
P	50.4	49.6	100.0
NP	30.1	69.9	100.0
Total	50.4	49.6	100.0

P – Poor, NP – Non-poor.
Source: Authors' calculations from ARIS-REDS data.

Table 13: Average Annual Rate of Growth of Per Capita Expenditure between 1970 and 1981 across Households in Each Decile (%)

Deciles*	Mean	Standard Deviation	Coefficient of Variation
I	7.02	4.59	0.65
II	3.19	4.27	1.34
III	2.84	4.62	1.63
IV	1.65	4.44	2.69
V	1.97	4.30	2.18
VI	0.88	4.49	5.10
VII	0.25	4.88	19.51
VIII	-0.98	4.39	-4.48
IX	-1.62	5.52	-3.41
X	-4.51	6.06	-1.34

* Deciles are created by arranging the data in increasing order of real per capita monthly expenditure of households in 1970-71.
Source: Authors' calculations from ARIS-REDS data.

However, given the difference in time duration between the three survey rounds, the slower rate of decline in the incidence of poverty is evident. Between 1970 and 1981, a period of 11 years, 46.1% of the poor became non-poor (Table 10). However, between 1981 and 1998, a period of 17 years, only 43.5% of the poor became non-poor (Table 11). The point that it may be harder to reduce poverty as the overall poverty incidence declines is illustrated by this pattern.

Dynamics of Consumption Expenditure and Poverty Reduction

The above analysis has dealt with the incidence of poverty and the movement of households into and out of the poverty in discrete poverty status categories. We attempt a separate analysis of monthly per capita expenditure (MPCE) to gain further insight into the nature of changes in income in rural India. At this stage, we point to the broad trends in consumption expenditure as captured in the present panel data. Table 13 (p 94) illustrates the patterns of changes in consumption expenditures of the households at different average levels of expenditure.

Table 14: Average Annual Rate of Growth (%) of Per Capita Expenditure between 1981 and 1998 across Households in Each Decile

Deciles*	Mean	Standard Deviation	Coefficient of Variation
I	3.82	3.77	0.99
II	2.20	2.66	1.21
III	1.36	3.03	2.23
IV	0.62	2.89	4.66
V	0.14	2.93	20.94
VI	-0.34	2.78	-8.18
VII	-0.48	3.02	-6.30
VIII	-1.23	3.10	-2.52
IX	-1.88	3.37	-1.79
X	-3.22	3.25	-1.01

* Deciles are created by arranging the data in increasing order of real per capita monthly expenditure of households in 1981-82.
Source: Authors' calculations from ARIS-REDS data.

Table 15: Average Annual Rate of Growth (%) of Per Capita Expenditure by Deciles

Deciles*	1970-81	1981-98
I	7.67	4.17
II	4.06	2.79
III	3.91	2.15
IV	2.65	1.34
V	2.90	0.86
VI	1.85	0.31
VII	1.44	0.30
VIII	-0.03	-0.40
IX	0.09	-0.95
X	-3.53	-2.85

* Deciles are created by arranging the data in increasing order of real per capita monthly expenditure of households in 1970-71 and 1981-82, respectively. The growth rates are based on average per capita consumption expenditure for each decile.
Source: Authors' calculations from ARIS-REDS data.

The monthly expenditure of the households available from the survey data is divided by household size and deflated by the corresponding state-level CPI-AL to arrive at the real MPCE of the households in the survey. The households are arranged in increasing order of their real per capita monthly expenditure and divided into deciles. It can be seen from Tables 13 and 14 that the lower deciles have higher annual average growth rates for per capita expenditure, more so for the period 1970-71 to 1981-82.

The upper deciles (VI to X) experience a negative rate of growth, with lower growth for the period 1981-82 to 1998-99. This is important, as the higher growth rate of lower deciles would help them push out of poverty. There were larger increases for lower deciles and decreases for higher deciles, in the growth rate of expenditure, in the first period. The first period thus led to more equitable distribution of consumption. This is also reflected in the pattern of annual rate of growth of average real MPCE of each decile (Table 15).

NSS data reveals that the 1990s saw large increases in consumption by the relatively rich (Sen and Himanshu 2004, Table 16). There was nearly a 20% increase in consumption spending for the top rural quintile. But the picture is very different for the bottom 80% of the rural population. Real per capita consumption of this vast majority of Indians increased at between 1 and 1.5% per annum during the 1970s and 1980s. Their consumption during the 1990s was lower in most years compared to 1989-90, and the maximum attained since then (in 1999-2001) was only about 3% higher. Sen and Himanshu thus conclude that economic inequality increased sharply during the 1990s in all its aspects and, as a result, poverty reduction deteriorated markedly despite higher growth.

Table 16: Fractile-Specific Annual Rate of Growth in Real MPCE: Rural (%)

Years	Bottom 40%	Next 40%	Top 20%
1977-78 to 1987-88	1.43	1.16	0.01
1983-84 to 1993-94	1.01	0.54	0.39
1986-87 to 1995-96	1.54	0.67	0.65
1987-88 to 1999-2000	0.78	0.73	1.41
1989-90 to 2000-01	0.21	0.24	1.76

The deflator used is the National Accounts Statistics deflator for private consumption expenditure.
Source: Reproduced from Sen and Himanshu (2004).

Table 17: Share of Various Deciles in Total Expenditure (Proportion)

Deciles*	1970-71	1981-82	1998-99
I	0.038	0.067	0.072
II	0.050	0.072	0.081
III	0.067	0.087	0.086
IV	0.081	0.085	0.089
V	0.088	0.106	0.098
VI	0.098	0.104	0.106
VII	0.103	0.104	0.103
VIII	0.124	0.115	0.122
IX	0.155	0.130	0.122
X	0.197	0.129	0.122

* Deciles are created by arranging the data in increasing order of real MPCE of households in 1970-71 in each of the three period.
Source: Authors' calculations from ARIS-REDS data.

Table 18: Share of Deciles in Total Expenditure (Proportion)

Deciles*	1970-71	1981-82	1998-99
I	0.038	0.046	0.060
II	0.050	0.060	0.072
III	0.061	0.071	0.081
IV	0.081	0.078	0.079
V	0.088	0.092	0.084
VI	0.098	0.105	0.090
VII	0.103	0.120	0.099
VIII	0.124	0.119	0.107
IX	0.155	0.127	0.129
X	0.197	0.182	0.199

* Deciles are created by arranging the data in increasing order of real per capita monthly expenditure of households in 1970-71, 1981-82 and 1998-99 independently of other survey year.
Source: Authors' calculations from ARIS-REDS data.

The two sets of results, i e, using the panel data as in the present study and using independent surveys for different years as in the Sen and Himanshu (2004) study show that there may be significant effects of transitory movements of households across consumption categories. Bhattacharya (2001), using the NSS data, reports an increase in the Lorenz ratio and an almost stable share of the bottom 50% of rural households between 1970-71 and 1983, while the Lorenz ratio drops between 1983 and 1999-2000 and the share of the bottom 50% households in total expenditure increases. Thus, while the panel data clearly shows a faster rise in per capita expenditure for the lower deciles than the upper deciles, the pattern emerging from the independent survey rounds varies across the years. These differences would have to be kept in view while drawing inferences from the findings.

The share of total monthly real expenditure of each decile in the total expenditure of the panel households surveyed in the present study is given in Tables 17 and 18. If we keep the households fixed according to the 1970-71 order of real MPCE, the share

of the lowest decile in total expenditure of the whole sample increases from 0.038 in the 1970-71 to 0.067 in 1981-82 and reaches 0.072 in 1998-99. However, for the upper decile, the proportion falls from 0.197 to 0.129 and 0.122, respectively. For the VIII and IX deciles, the proportion increases in the period 1981-82 to 1998-99. This clearly reflects the potential for movement of households across consumption categories in all expenditure brackets. Though the movement is towards equality, the inequality amongst the households persists, as the gap between lower (less than 1% share for the lowest decile) and higher deciles (more than 12% share in consumption expenditure for the highest decile) is still large.[4]

If we categorise households according to expenditure deciles for each time period, i e, we arrange the households according to that period's per capita expenditure levels and then calculate their shares in total expenditure, it would show changes in the status of poverty and inequality over time. We find that when we carry out this exercise, there are changes in the pattern of inequality over the period of 28 years. Over the 28-year period from 1970 to 1998, the lowest decile's share increases from 3.8% to 6%. But, for the highest decile also, it increases marginally from 19.7% to 19.9% (after a decline to 18.2% in 1981-82). The fall in inequality is more conspicuous in terms of increases in the share of lower expenditure deciles, than with regard to the decline in the share of upper deciles. The expenditure share of the lowest 20% of the households increases from 8.8% in 1970-71 to 13% in 1998-99 and the top 20% falls from 35.2% to 32.8% for the same period.

The findings above clearly show a tendency for households with lower per capita consumption expenditures to experience faster growth over time than households with higher per capita expenditure. What explains this tendency towards reduction in inequality in expenditure in the panel data? Is it because of the many changes taking place in the economy including various welfare programmes in place? It would be relevant to examine, going forward, if the convergence holds even after accounting for some of the factors that influence consumption expenditures.

Concluding Remarks

This study deals with the incidence and mobility of poverty across discrete poverty status categories. The present analysis is based on the data collected by the NCAER through household surveys of 3,139 households in rural India, conducted in three rounds in 1970-71, 1981-82 and 1998-99. A unique contribution of panel data is the information it provides on poverty dynamics. The movement of the households into and out of the poverty can be captured through a transition matrix of such movements.

An important trend emerging from the panel data was the slower rate of decline in rural poverty in the second period (1981-98) of the survey as compared to the first (1970-81). This was also the pattern indicated by the national surveys of consumption expenditure. The period from 1970 to 1981 was better for poverty reduction than the later period of 1981 to 1998 in the sense that the rate of poverty reduction was faster. Movement out of poverty was also found to be higher in the first period. The incidence of chronic poverty in the panel, defined as percentage of households remaining poor in consecutive survey rounds, has declined from 27.06% in 1970-1981 to 22.8% during 1981-98.

Further analysis of the growth rates of per capita expenditure for the same set of households clearly show a tendency for households with lower per capita consumption expenditures to experience faster growth over time compared to households with higher per capita expenditure. This is important, as the higher growth rate of lower deciles would help push them out of poverty.

A slower decline in poverty has occurred even though the rate of economic growth was faster during the second period. There were also larger increases for lower deciles and larger decreases for higher deciles in the growth rate of expenditure in the first period. The first period thus led to more equitable distribution of consumption. Economic growth alone, therefore, has not been adequate to ensure faster poverty and inequality reduction during this period.

NOTES

1 There may be other indirect indicators such as the health status, including malnutrition. These may be taken as indicators of the individual suffering from long-term poverty.

2 The estimates presented here vary from those presented in an earlier paper (Bhide and Mehta 2005) because of the difference in the number of households used in the panel. We have used a smaller subset of the original panel because of the requirements of analysis presented later in this paper. However, the trends in the dynamics of poverty presented in both the papers are the same. The mobility of households across poverty categories presented here is partial. A fuller account of the dynamics is presented in the transition matrices in Tables 4-6.

3 The status of the households during the inter-survey period is not recorded in the surveys. To this extent, the data does not accurately capture the status of households with respect to poverty throughout the period 1970 to 1998.

4 Since urban households are not included, this is only a partial reflection of the extent of inequality for the economy as a whole. We should also note that analysis here is based on unweighted data.

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