

# CHAPTER 7

## EMPIRICAL STUDIES OF INEQUALITY

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## CHAPTER 7

### THE EMPIRICAL STUDY OF INEQUALITY

#### 7.1: INTRODUCTION

Now, we turn to the impact of globalization on income distribution and poverty incidence *within* countries. Milanovic's (2002b) cross-country econometric analysis, based on household survey data in 1988 and 1993, suggests that openness worsens individual countries' income distribution before improving it, and that the effect of openness on income distribution depends on the country's initial income level. In his view, this is conditioned by the fact that 'openness helps those with basic and high education, but reduces the income share of those with no education' and 'it is only when basic education becomes the norm even for the poor that openness exert an income equalizing effect'. Thus, Milanovic postulates that 'openness helps income distribution chart an inverted U-shaped curve as the income level increases. At low income levels, openness is bad for equality: at medium and high income level, it promotes equality' (Milanovic 2002b: 13).

Easterly (2003) also advances the hypothesis of an inverted U-shaped relationship between inequality and openness, measured as  $(Exports + Imports)/GDP$ , which would drive out the usual Kuznetz curve between income and inequality, typically found in cross-country empirical studies. However, he explains this in terms of the cross-country difference in factor endowments and the trade openness: less open economies tend to export mainly natural resource-based commodities that are associated with inequality, whilst open economies export labour-intensive manufactures and services, whereby inequality diminishes. However, as he admits, his hypothesis is based on a casual observation rather than a rigorous analysis.

#### 7.2: GLOBAL INEQUALITY AND INEQUALITY IN THE SOUTH ASIAN NATIONS

There are three desirable properties we look for in any measure of inequality.

First: mean or scale independence—the index does not change if everyone's income changes by the same proportion.

Second: population size independence – the index does not change if the number of people at each income level is changed by the same proportion.

Third; the Pigou-Dalton condition – any transfer from a rich person to a poor person which does not alter their relative rank lowers the value of the index.

Here we consider two inequality indices – the Gini coefficient and the Theil entropy index. Both the indices are widely used and satisfy the three desirable condition/ properties stated above. In addition to the indices the percentile share of income – the proportion of global income accruing to percentile to global population, are also examined.

We use the Penn World Table data set [PWT] where the economic variables are expressed in a common set of prices and in a common currency. The development of this data set has allowed for more meaningful comparisons of variables across countries and also served as a catalyst in empirical research on analysis of the international pattern of economic growth.

The sample covers 186 countries of the world which covers 99% of the global income and population. We consider the variable Population and the Per Capita Income (i.e. POP & RGPC in PWT) of each country (or political entity). We examine the data for 5 year period from 1980 to 2003 (4) as no more current data are available. The global income inequality refers to the inequality among the nations of the world rather than individuals of the world. The key assumption made here is that all individuals of the country earn the same level of income. Although there are rich Indians and poor Americans, on average an Americans will be rich and the Indians will be poor on average. Here we would like to investigate whether, on average, the gap between the Indians and the Americans has been narrowing or not over the last two decades; equivalently with the, whether or not the Indians have been catching USA.

Now we examine, briefly, the trend in global population, global income and global per capita income over the years. Global population and Global income is obtained by summing up the populations and national incomes of all the countries of the world and the per-capita income is derived by dividing global income by population.

TABLE 7.1: GLOBAL POPULATION, TOTAL INCOME AND PCI

YEAR	POPULATION (MILN.)	TOTAL INCOME (BL. US \$)	PER CAPITA INCOME (US\$)
1960	3,034.463	6,713.408	2,212
1965	3,334.056	8,666.272	2,599
1970	3,686.315	11,164.98	3,029
1975	4,053.464	13,576.77	3,349
1980	4,121.143	16,589.04	3,750
1985	4,802.0256	18,997.39	3,956
1990	5,255.081	22,168.57	4,219
1995	5,646.779	37,398.23	6,622
2000	6,052.688	45,730.12	7,555
2003	6,264.281	53,343.86	8,515

It must be emphasized that the empirical evidence we refer to here are actually factual rather than truly empirical. We do not rely on any underlying probability models or draw inferences to larger population, here we simply report the recent trends in international income inequality for the period 1960-2003.

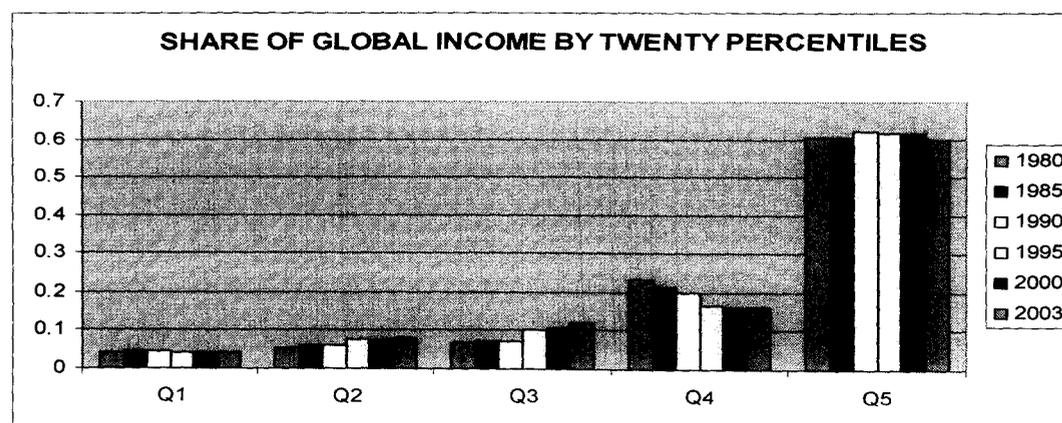
### 7.3: PERCENTILE SHARE OF GLOBAL INCOME

We divide the world population – or more precisely, the total population of the countries of our sample into fifths, tenths and twentieths. First we rank all the countries by their per capita income. Thus, in 1980, Liberia or Cambodia at one end and Luxembourg at the other. For the case of fifth, we divide the global population by five. In constructing the poorest fifth, we would include all Liberians or Cambodians as well as the population of the next poorest countries until the one fifth of the global population living in the poorest countries are included. On the other hand, the richest fifth would include of all Americans as well as the population of the next richest countries until one fifth of the global population living in richest countries are included. We repeat the same process for the other fifths. Countries at the cut off points will have a part of their population included in one fifth and another included in other fifth. The same methodology is applied for dividing the global population by tenths and twentieths in terms off per capita income.

TABLE 7.2: GLOBAL INCOME SHARE BY TWENTY PERCENTILES

	1980	1985	1990	1995	2000	2003
<b>Q1</b>	0.042448	0.044739	0.046028	0.040747	0.04005982	0.039774442
<b>Q2</b>	0.051208	0.060351	0.061616	0.074407	0.07597654	0.078767487
<b>Q3</b>	0.067434	0.071998	0.071046	0.101624	0.10524635	0.119431048
<b>Q4</b>	0.234082	0.216213	0.200109	0.165907	0.16170674	0.163096283
<b>Q5</b>	0.604828	0.606645	0.6212	0.617292	0.61699277	0.598933146

FIG. 7.1: TWENTY PERCENTILE SHARE OF GLOBAL INCOME



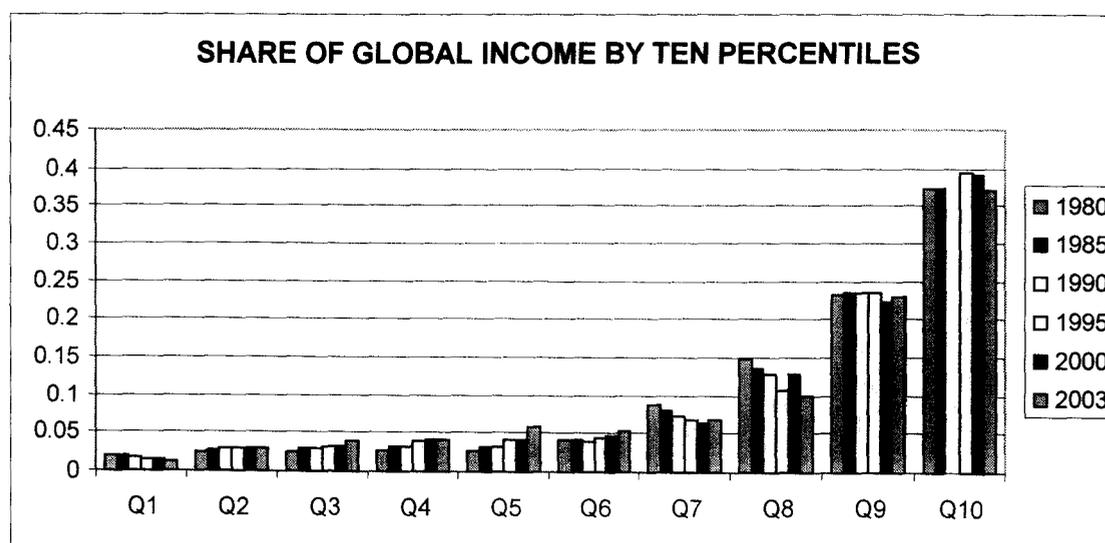
The above table (7.1) shows the share of global income by Twenty Percentile. In this table Q1 refers to the share of the share of the global income accruing to the poorest fifth of the global population, while Q5 indicates the share of the richest fifth. There does not appear that the percentile trend towards convergence. This illustrates that the share of the global income accruing to each has remained fairly stable over the years.

Now we examine the data on the basis of tenth of populations and the corresponding income shares.

TABLE 7.3: GLOBAL INCOME SHARE BY TEN PERCENTILES

	1980	1985	1990	1995	2000	2003
<b>Q1</b>	0.018926	0.018151	0.016855	0.014007	0.013603	0.012435
<b>Q2</b>	0.023522	0.026642	0.029173	0.028536	0.028429	0.02853
<b>Q3</b>	0.025286	0.02833	0.030231	0.032040	0.032051	0.037725
<b>Q4</b>	0.025922	0.032021	0.031386	0.038172	0.040983	0.041566
<b>Q5</b>	0.02732	0.032021	0.031424	0.0407523	0.041297	0.05766
<b>Q6</b>	0.040134	0.039977	0.039622	0.044292	0.046932	0.052489
<b>Q7</b>	0.085921	0.07991	0.071706	0.067597	0.062671	0.067336
<b>Q8</b>	0.148161	0.136303	0.128404	0.1062408	0.127543	0.100305
<b>Q9</b>	0.233457	0.233687	0.234998	0.234707	0.222532	0.22961
<b>Q10</b>	0.371371	0.372958	0.386203	0.394635	0.391243	0.371362

FIG. 7.2: SHARE OF GLOBAL INCOME BY TEN PERCENTILES

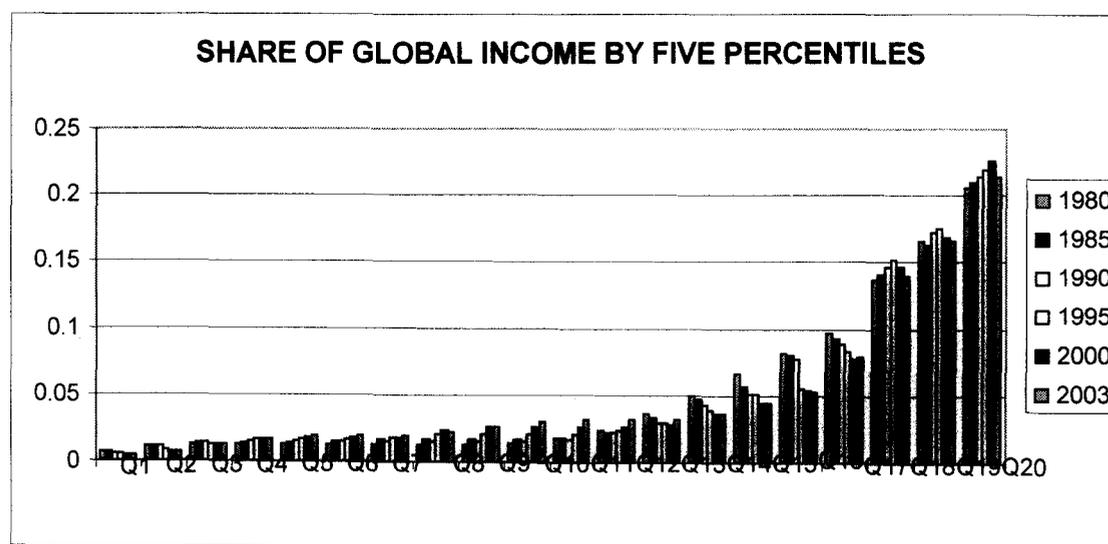


Following the same procedure here the Global income share is calculated by five percentiles. This is shown in the following table.

TABLE 7.4: GLOBAL INCOME SHARE BY FIVE PERCENTILES

	1980	1985	1990	1995	2000	2003
Q1	0.007194	0.006606	0.006152	0.004934	0.004303	0.0041138
Q2	0.011731	0.011545	0.010702	0.008073	0.007327	0.0073901
Q3	0.011761	0.013321	0.014191	0.012519	0.012148	0.0119425
Q4	0.011761	0.013321	0.014982	0.016023	0.016308	0.0159964
Q5	0.012325	0.013332	0.014785	0.015886	0.017497	0.0188627
Q6	0.012961	0.014998	0.015249	0.015886	0.017497	0.0188627
Q7	0.012476	0.016021	0.015793	0.017753	0.017497	0.0188627
Q8	0.012435	0.016321	0.015684	0.020377	0.023487	0.0222157
Q9	0.012337	0.016211	0.015594	0.020377	0.025814	0.0261331
Q10	0.014339	0.016011	0.015732	0.020377	0.026483	0.0310486
Q11	0.017332	0.017774	0.016919	0.020377	0.026483	0.0312444
Q12	0.022802	0.022202	0.022703	0.023916	0.026483	0.0312444
Q13	0.035632	0.032529	0.029312	0.028447	0.027032	0.0312444
Q14	0.050289	0.047381	0.042359	0.03915	0.035641	0.0353314
Q15	0.066641	0.056471	0.050864	0.05079	0.044835	0.0442026
Q16	0.08125	0.079833	0.077543	0.055452	0.054201	0.0528689
Q17	0.097188	0.092197	0.088896	0.082631	0.076707	0.0792084
Q18	0.136296	0.14149	0.146102	0.152089	0.145838	0.1399026
Q19	0.165682	0.162515	0.172709	0.17497	0.168372	0.1659337
Q20	0.205689	0.210442	0.213494	0.219717	0.226078	0.2140928

FIG. 7.3: GLOBAL INCOME SHARE BY FIVE PERCENTILES



As with the twenty percentile, there does not seem to be any significant convergence and the share of each percentile seems to have remained fairly stable over the period 1980 to 2003.

### **RANGE:**

Perhaps the most elementary gauge of income inequality is range, or the difference between the highest and the lowest income level. The range can convey a limited information since it ignores the distribution of income between the extremes. Here we put the range in terms of fifths, tenths and twentieths of population to get an idea of gap between the average incomes of the richest and the poorest countries. Let us first consider the differences between the richest and the poorest fifths.

TABLE 7.5: RANGE OF TWENTY PERCENTILE INCOMES:

	1980	1985	1990	1995	2000	2003
<b>Average income of Q1 of fifth</b>	796	883	971	1367	1513	1698
<b>Average income of Q5 of fifth</b>	11340	11954	13103	19049	23307	25577
<b>Difference between Q5 and Q1</b>	10544	11071	12132	17682	21794	23879
<b>The ratio of Q5 to Q1</b>	14.2	13.5	13.5	13.93	15.4	15.06

Now we examine the gap between the richest and the poorest tenths.

TABLE 7.6: RANGE OF TEN PERCENTILE INCOMES:

	1980	1985	1990	1995	2000	2003
<b>Average income of Q1 of tenth</b>	710	715	711	861	878	990
<b>Average income of Q10 of tenth</b>	13925	14699	16292	26140	29801	31925
<b>Difference between Q10 and Q1</b>	13215	13984	15581	25279	28923	30935
<b>The ratio of Q10 to Q1</b>	19.6	20.6	22.9	30.36	33.94	32.24

Finally we analyze the range of income in terms of the twentieths of global population.

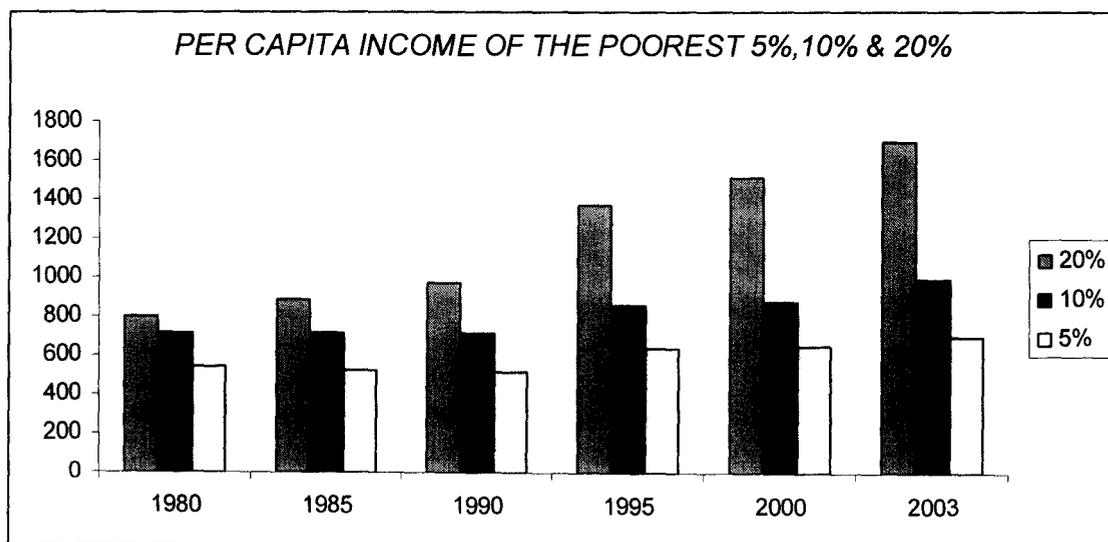
TABLE 7.7: RANGE OF FIVE PERCENTILE INCOMES:

	1980	1985	1990	1995	2000	2003
<b>Average income of Q1 of twentieth.</b>	540	521	519	635	650	699
<b>Average income of Q20 of twentieth</b>	15425	16588	18012	29103	34161	37114
<b>Difference between Q20 and Q1</b>	14885	16067	17493	28468	33511	36415
<b>The ratio of Q20 to Q1</b>	28.6	31.8	34.7	45.8	52.5	53

The ratio or the relative gap in income between the richest and the poorest differs substantially depending on whether we consider fifths, tenths or twentieths of global population as our unit of comparison. For the fifth the ratio rises steadily after 1985. For the tenths the ratio rises from 1980, and for the twentieth the ratio rises throughout. The overall rise is substantial-- from 28.6 in 1980 to 53 in 1990.

In terms of the increase in average incomes of the richest and the poorest countries of the world, there has been a substantial increase in the richest countries over the period 1980 to 2003, regardless we consider fifths, tenths or twentieths. On the other hand, for the poorest, the rise in average income over the same period differs substantially depending on whether we use fifths, tenths or twentieths. In case of fifths, the increase is more than double, the increase is roughly 40 % for tenths and for the twentieths the rise is merely 30%. On the other hand the rise for the richest was considerably larger in all cases. For the fifths the rise was 125%, for the tenths it was 129% and for the twentieths the rise was 140%.

FIG. 7.4: PER CAPITA INCOME OF THE POOREST 5%,10%, & 20%



#### 7.4: THE COUNTRY CASE STUDY

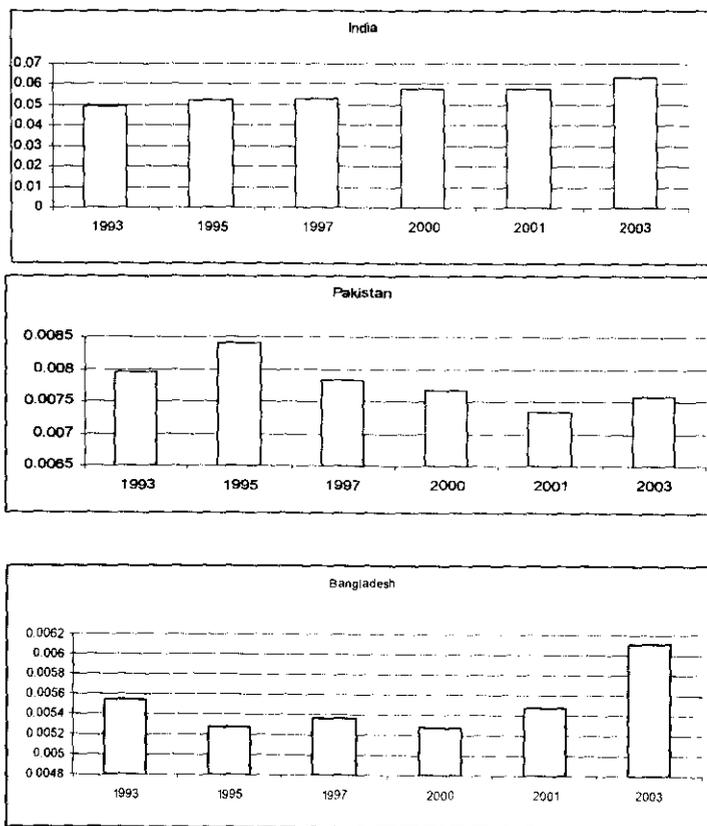
Now we consider the per capita income of the six SAARC nations compared to the world income over the period 1993 to 2003. Here we follow the same procedure as above where we calculate the fifths, tenths and the twentieths. Here for only the six nations it is not statistically valid to calculate the twenty, ten or five percentiles as the total income of these nations are much lesser compared to the global income levels. For this reason we consider only the total income of

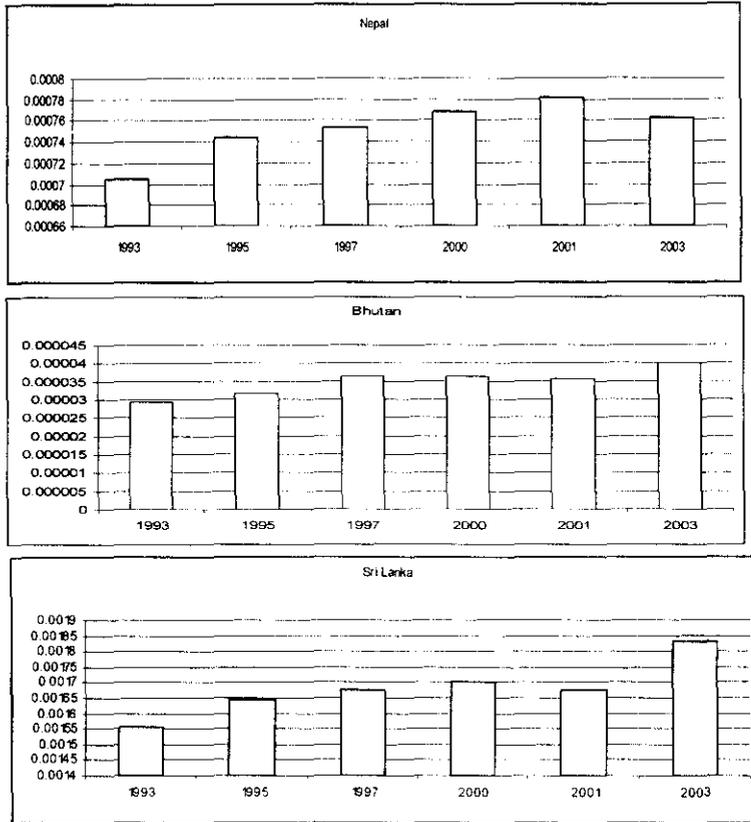
these countries and tried to compare them with the global income in those respective years. In the following table we table we have the income level comparison.

**TABLE 7.8: INCOME SHARE OF THE SIX SELECTED COUNTRIES**

	1993	1995	1997	2000	2001	2003
<b>India</b>	0.049216	0.052339	0.052727	0.057971	0.057922	0.063216
<b>Pakistan</b>	0.007954	0.008393	0.007843	0.007668	0.007333	0.007571
<b>Bangladesh</b>	0.005549	0.005266	0.005364	0.005279	0.005468	0.006102
<b>Nepal</b>	0.000704	0.000744	0.000754	0.000768	0.000782	0.000763
<b>Bhutan</b>	0.000293	0.000316	0.000364	0.000363	0.000356	0.000402
<b>Sri Lanka</b>	0.001554	0.001646	0.001679	0.001702	0.001675	0.001831

**FIG 7.5: GRAPHICAL REPRESENTATION OF THE GLOBAL INCOME SHARE OF THE SIX SAARC COUNTRIES**



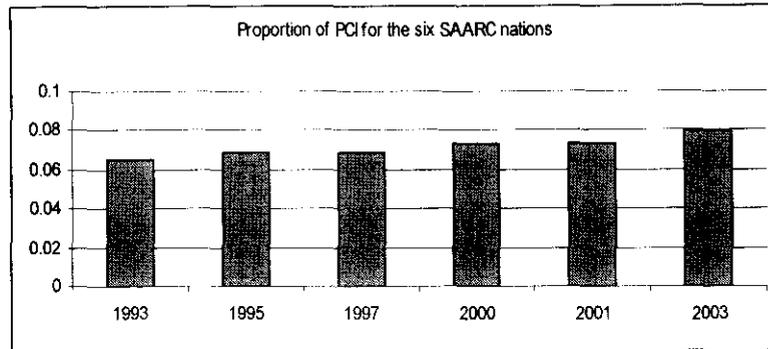


From the data it is seen that in these six countries there are different trends in per capita income growth over the years. Bhutan has more or less unchanged proportion of income during that ten years period, though it covers a very little proportion of income. In case of Nepal there was a steady increase till 2001, and a slight fall in 2003. Bangladesh shows a little bit fluctuating trend, initially a fall and a steady increase thereafter. India depicts a stable trend with a slight rise in recent years and the trend is increasing. There is a declining trend for Pakistan up to 2001 and the trend is turning reverse after that. Only in case of Sri Lanka we have a steady rising trend in per capita income. The primary conclusion for all these countries can be drawn that the proportion of per capita income remains more or less stable over the years, specifically after globalization. The slight increase which is depicted in the figure is a marginal rise and numerically these are not so considerable.

When we consider the total income as a proportion of global income this will also show the same picture, shown in the following table.

FIG. 7.6: INCOME PROPORTION OF THE SIX COUNTRIES AS A WHOLE

Year	Proportion
1993	0.06500724
1995	0.06841897
1997	0.06840304
2000	0.07342371
2001	0.0732159
2003	0.07952335



This shows a slight steady rise in the proportion of PCI as compared to the global income. The rise is not at all significant and it is clear from the numerical data, 6.5% to 7.9% over the ten years while the global income raised nearly 52% over these ten years period. More specifically the per capita income of the richest nations has increased by 43.24% from 1993 to 2003 but that for these poor nations has increased by 22% on overall basis.

## 7.5: INEQUALITY MEASUREMENT

### A) GINI COEFFICIENT

The Gini coefficient is the most well known and the most widely used measures of inequality. It is based of the Lorenz curve, which plots the cumulative share of total income against the cumulative share of total population. The smaller the area between the 45-degree line and the actual income distribution, the smaller the degree of inequality. The Gini coefficient is a convenient one number summary of inequality in the sense of Lorenz curve. The formula for calculating the Gini coefficient is:

$$G = 1 + \frac{1}{n} - \frac{2}{n^2} \sum_{i=1}^n y_i (y_n + 2y_{n-1} + \dots + ny_1) , \text{ where } y_i = \text{income of } i\text{th person and } y_1 \leq y_2 \leq \dots \leq y_n .$$

We derive the values of Gini coefficients for fifths, tenths and twentieths of the population by simply replacing the incomes with shares of income and average income with the average share of income so that

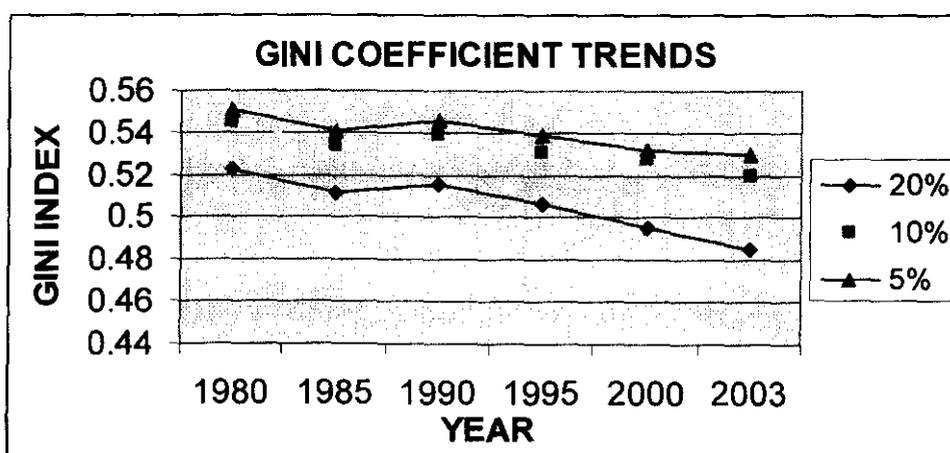
$$G = 1 + \frac{1}{n} - \frac{2}{n^2} \sum_{i=1}^n q_i (q_n + 2q_{n-1} + \dots + nq_1) , \text{ where } q_i = \text{income of } i\text{th person and } q_1 \leq q_2 \leq \dots \leq q_n$$

Thus we obtain the following result making use of this measure of Gini coefficient.

TABLE 7.9: GLOBAL GINI COEFFICIENT TRENDS AT DIFFERENT INCOME SHARE

	1980	1985	1990	1995	2000	2003
20%	0.52305	0.51182	0.51554	0.50674	0.49573	0.48536
10%	0.54488	0.53341	0.53849	0.53108	0.52768	0.52012
5%	0.55091	0.54073	0.54595	0.53854	0.53213	0.52974

Fig. 7.7: GLOBAL GINI COEFFICIENT TRENDS AT DIFFERENT INCOME SHAR



Regardless of the population share is considered, the Gini coefficient exhibits the same pattern – initial fall, a slight rise and then a subsequent fall up to 2003. In all the three cases the value of the coefficient does not differ substantially from 1980 to 2003.

## B) THEIL INDEX

The entropy index (T) developed by Theil (1967) is based on the notion of entropy in information theory, which is expressed as:

$$T = \sum^n (y_i / Y) \log \frac{(y_i / Y)}{(1/n)}$$

where  $(1/n)$  is the population share of person  $i$  and  $(y_i / Y)$  is the income share of  $i$ th person.

For our purpose, we need to replace the individual share ( $y_i / Y$ ) with  $q$  so that

$$q_i$$

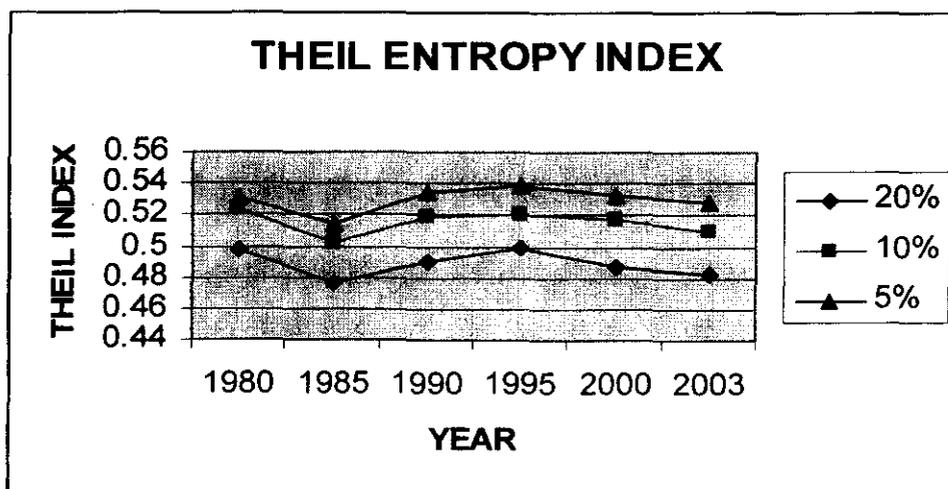
$$T = \sum^n q_i \log \frac{q_i}{(1/n)} \quad \text{where } (1/n) \text{ is the population share of group } i \text{ and } q_i \text{ is the income share of group } i.$$

Theil index interprets  $T$  as “the expected information of a message which transforms population shares into income shares.” When there is perfect equality,  $T$  becomes zero and conversely, when there is perfect inequality so that single person receives all the income,  $T$  assumes its maximum value of ‘log  $n$ ’. ( $T$  satisfies all the three desirable properties).

**TABLE 7.10: THEIL ENTROPY INDEX FOR 1980 TO 2003 AT GLOBAL LEVEL FOR DIFFERENT PERCENTILES OF INCOME**

	1980	1985	1990	1995	2000	2003
20%	0.49728	0.47711	0.49044	0.49875	0.48675	0.48324
10%	0.52300	0.50205	0.51933	0.52052	0.51685	0.51023
5%	0.53141	0.51475	0.53357	0.53879	0.53196	0.52743

**FIG. 7.8: THEIL ENTROPY INDEX AT DIFFERENT PERCENTILES OF INCOME**



The general patterns are the same as for the Gini coefficient and the squared coefficient of variation, in terms of both trends and changes between 1980 and 2003.

ABLE 7.11 B PAKISTAN

YEAR	GINI	TWENTY PERCENTILE COUNT OF PCI					TEN PERCENTILE COUNT OF PER CAPITA INCOME									
		Q1	Q2	Q3	Q4	Q5	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
1984	38.3	7.90	11.89	15.47	22.34	42.40	2.62	3.81	4.67	5.53	6.48	7.58	9.08	11.29	15.31	33.63
1985	35.0	8.54	12.34	16.22	21.53	41.37	3.63	4.62	5.54	6.43	7.38	8.42	9.69	11.40	14.33	28.56
1986	36.0															
1987	37.0	8.47	12.50	16.41	21.66	40.96	3.64	4.71	5.65	6.57	7.51	8.56	9.80	11.48	14.30	27.78
1988	31.2	8.61	12.76	16.60	21.64	40.39										
1990	39.0	5.70	10.67	14.38	19.95	49.30	3.53	4.65	5.39	6.15	6.91	7.79	8.96	10.65	13.85	32.13
1991	38.2															
1992	41.0	6.20	11.21	13.78	20.78	48.03	2.70	3.80	4.60	5.50	6.40	7.40	8.90	10.60	14.10	36.10
1993	42.7						3.26	4.24	4.91	5.52	6.17	6.95	7.95	9.38	12.24	39.37
1995	41.1	6.40	11.04	13.90	20.56	48.10										
1996	39.8						3.58	4.58	5.26	5.86	6.51	7.25	8.19	9.49	11.90	37.36
1998	35.3	7.88	12.34	15.87	21.91	42										
1999	36.3						2.70	4.20	5.30	6.30	7.20	8.50	9.90	12.00	15.30	28.60
2001	36.4															
2003	35.5	8.44	12.47	15.92	21.23	41.94	3.00	4.10	5.00	5.90	6.80	7.70	9.20	11.20	14.80	32.30

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ABLE 7.11 C: BANGLADESH

YEAR	GINI	TWENTY PERCENTILE COUNT OF PCI					TEN PERCENTILE COUNT OF PER CAPITA INCOME									
		Q1	Q2	Q3	Q4	Q5	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
1983	35.6	8.70	10.90	14.60	21.70	44.10	2.89	4.31	5.39	6.36	7.38	8.56	9.99	11.74	15.08	28.30
1986	38.3						3.24	4.81	5.68	6.54	7.45	8.52	9.86	11.77	15.18	26.97
1988	38.8						3.24	4.81	5.68	6.54	7.45	8.52	9.86	11.77	15.18	26.97
1989	38.0	7.36	11.67	16.04	22.01	42.92	4.07	5.28	6.29	7.22	8.13	9.11	10.24	11.75	14.23	23.68
1992	37.0						3.93	4.78	5.59	6.43	7.32	8.33	9.57	11.27	14.21	28.57
1996	41.2						2.93	4.21	5.09	5.96	6.91	7.93	9.34	11.48	14.96	31.18
2000	33.7	9.00	12.50	15.90	21.20	41.30	3.90	4.34	4.88	5.80	7.76	7.94	10.78	12.67	15.23	26.70

TABLE 7.11 D: NEPAL

YEAR	GINI	TWENTY PERCENTILE COUNT OF PCI					TEN PERCENTILE COUNT OF PER CAPITA INCOME									
		Q1	Q2	Q3	Q4	Q5	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
1984	30.0	9.11	12.89	16.68	21.82	39.50	3.66	3.89	4.77	5.64	6.98	7.52	8.67	11.74	14.89	32.24
1987	32.3															
1989	33.4	8.67	12.34	15.78	22.1	41.11										
1990	35.0						2.91	4.11	4.69	5.65	6.98	7.34	9.88	11.22	13.71	33.5
1992	34.6	8.12	11.67	15.02	22.45	42.74										
1993	35.2						2.78	4.01	4.69	5.85	6.88	7.24	8.58	11.62	14.21	34.1
1995	36.6	7.56	11.45	14.78	23.34	42.87										
1996	38.4						2.24	3.33	4.09	4.90	5.89	6.96	8.49	10.63	14.54	38.94
1998	38.2	6.67	10.78	13.88	24.28	44.39										
2000	35.6						3.01	4.21	4.89	5.45	6.78	7.34	8.88	11.12	14.11	34.2
2003	34.6						3.15	4.44	5.25	6.01	6.84	7.78	8.95	10.61	13.52	33.45

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TABLE 7.11E: SRI LANKA

YEAR	GINI	TWENTY PERCENTILE COUNT OF PCI					TEN PERCENTILE COUNT OF PER CAPITA INCOME									
		Q1	Q2	Q3	Q4	Q5	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
1982	44.9	5.70	9.90	13.80	18.70	51.90	2.34	3.32	4.34	5.12	6.05	7.23	8.50	12.03	14.47	36.6
1995	45.7															
1986	46.0	4.32	8.89	13.21	20.76	52.82	1.70	3.10	4.10	5.00	6.00	7.30	8.80	11.20	15.40	37.40
1987	38.8															
1991	44.7	5.70	9.90	13.80	18.70	51.90	2.02	3.40	4.39	5.32	6.28	7.41	8.88	11.03	14.93	36.34
1994	45.6						2.18	3.55	4.35	5.24	6.35	7.02	8.69	10.71	14.52	37.29
1996	47.5	3.78	8.45	12.78	21.95	53.04	1.89	3.15	4.07	4.93	5.86	6.98	8.48	10.77	15.17	38.71
1998	45.8															
2000	46.8	4.34	9.32	13.53	19.86	52.95	0.58	1.86	2.83	3.69	4.65	5.70	6.96	8.61	11.45	53.67
2001	45.8															
2002	46.9	4.50	9.20	13.80	20.20	52.30	1.50	2.95	4.00	5.21	6.27	7.54	9.00	11.22	15.54	36.77

TABLE 7.11: GINI COEFFICIENT FOR INDIA, PAKISTAN, BANGLADESH, NEPAL & SRI LANKA.

TABLE 7.11.A. INDIA

YEAR	GINI	TWENTY PERCENTILE COUNT OF PCI					TEN PERCENTILE COUNT OF PER CAPITA INCOME										
		Q1	Q2	Q3	Q4	Q5	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	
1983	34.1	7.80	12.20	16.10	22.00	41.90											
1986	36.8						2.70	4.60	4.70	5.10	7.50	7.60	9.90	11.50	15.00	31.40	
1987	35.6																
1988	34.8	8.30	11.50	15.80	22.20	42.20	2.70	4.00	4.90	5.60	6.60	7.70	8.90	10.70	13.70	35.20	
1989	35.6																
1990	34.0																
1991	38.0	7.10	11.80	16.30	23.10	41.70	2.50	3.40	4.50	5.80	6.40	7.50	9.00	11.50	15.80	33.60	
1992	35.5																
1993	34.3	7.70	12.10	16.00	21.60	42.60	2.40	3.60	4.20	5.60	6.30	7.60	9.30	11.80	15.80	33.40	
1994	37.2						2.70	4.00	4.90	5.60	6.60	7.70	8.90	10.70	13.70	35.20	
1995	35.5	7.90	12.30	16.10	21.30	42.40											
1997	36.5						2.90	4.60	5.50	6.30	7.20	8.20	9.50	11.20	13.80	30.80	
1999	36.0	8.00	12.00	16.00	22.00	42.00	3.00	4.00	4.70	5.40	6.40	7.50	8.90	10.90	14.30	34.90	
1999	34.7						3.24	4.42	5.27	6.12	7.05	8.19	9.67	11.78	15.40	28.87	
2001	33.7																
2003	33.1	8.40	12.50	16.30	21.80	41.00	3.10	4.40	5.10	6.00	6.80	7.70	9.10	10.70	13.40	33.70	

Now we consider the Gini coefficient for the selected five selected SAARC countries as for reference study, instead of the six, as sufficient data were not available for Bhutan. For the other five countries the income inequality analysis is done on the basis of available data.

## INDIA

Here was no significant change in GINI coefficient over the years. In the initial years of economic reforms there was an increase in the coefficient and after ten years of the reforms the coefficient shows an improvement towards parity. But if we look at the twenty or ten percentile income (for Rs.100.00) this shows a clear disparity. Over the period of 20 years the proportion of income of the poorest class increased slightly while the share of income for the richest group remains more or less constant for the twenty percentile income count. Again in case of ten percentile group the share of per capita income for the richest group increased over the years. [data was not available for all the years of study]. In case of twenty percentile group the ratio of income between the poorest and the richest group lies between 1: 5.5 to 1: 4.8, and for the case of ten percentile the ratio lies between 1:13 to 1: 9.

## PAKISTAN

In Pakistan the distribution of income has improved a little bit compared to the last two decades. At the same time in the era of economic reforms the value of the Gini had increased by nearly 22percent. After that it begun to show an favorable distribution. Only the exception was the year 1988.The quintile distribution also shows the same trend. It has moved in favor of the poor slightly in recent years while in the reform years it was seriously unfavorable to the poor. The quintile ratio of income of the poorest and the richest varied between 1: 4.8 and 1: 8.6. The deciles positions also varied from 1: 10 to 1: 12, i.e. the distribution was greatly unequal.

## BANGLADESH

For Bangladesh a very short range of data were available. From 1986 to 2000 there was a significant improvement if gini coefficient—from 38.3 to 33.7. but when we look at the twenty percentile income share it is seen that the share of income of the poorest quintile has not improved too much and it is noticeable that in the transition years the share fell drastically while the share of the richest quintile fell throughout. Thus, the share of income in the other three quintiles increased more or less. The ratio of income share between the poorest and the richest group varies between 1: 5.8 to 1: 4.55, while the same for the ten percentile group varies between 1: 9.7 to 1: 5.8, the fluctuation was greater in

case of the poorest and the richest group while the intermediate groups shows a more or less stable share in case of deciles measure.

## NEPAL

In case of Nepal over the last twenty years the gini index has deteriorated and in the transition era [ 1993-1999] the income distribution was unfavorable and in has improved slightly after that. So far the data available, the quintile ratio of the poorest and the richest varied between 1: 4.34 to 1: 6.67 and over the years this ratio moved against the equitable distribution. If we observe the deciles ratio, it is seen that the variation was more drastic, from 1: 17.39 to 1: 10.6.and the trend for both quintiles and the deciles are nearly same, describing an inequitable distribution.

## SRI LANKA

The data for Sri Lanka shows that it has more inequality in the income distribution than the other neighboring SAARC nations. The average Gini is 45.3. the quintile ratio for the poorest and the richest varies from 1: 14 to 1: 9.1, and the same for the deciles was 1: 22 on the average. There was some irregular trend also in the income distribution.

From the above analysis the general conclusions can be drawn that over the last two decades the distribution of income has moved in favor of the lower strata a little bit [ except Sri Lanka, a more longer time analysis is needed], but in almost all cases ,in the transition years the costs of reform were borne by the poorer section of the society. The quintile and the deciles measurement of the income share clearly show an unfavorable distribution of income for the poor. The poorest 10 percent of the population consumes 3 to 4 per cent of the national income while the richest 10 per cent consumes nearly 30 to 35 per cent of the countries national income. This clearly illustrates an inequitable distribution of income. The story is almost same for all the poor countries of the world.

It is to be noted that the Gini for these five nations [ data were not available for Bhutan] show a comparatively more equitable distribution of national income than the other poor countries of the World. The following table shows this.

TABLE 7.12: HDI RANK AND GINI INDEX FOR SELECTED DEVELOPING COUNTRIES (Source WDR 2004)

HDI rank, Country	Survey year	Share of income or expenditure %				Richest 10% to poorest	Richest 20% to poorest	Gini index
		Poorest 10%	Poorest 20%	Richest 20%	Richest 10%	1,000.%	2,000.%	
54 Bulgaria	2003	3.4	8.7	38.3	23.9	7.	4.4	29.2
57 Trinidad and Tobago	1992	2.1	5.5	45.9	29.9	14.4	8.3	40.3
58 Panama	2002	.8	2.5	60.3	43.6	54.7	23.9	56.4
60 Romania	2003	3.3	8.1	39.2	24.4	7.5	4.9	31.
61 Malaysia	1997	1.7	4.4	54.3	38.4	22.1	12.4	49.2
92 Turkey	2003	2.	5.3	49.7	34.1	16.8	9.3	43.6
<b>93 Sri Lanka</b>	<b>1999-00</b>	<b>3.4</b>	<b>8.3</b>	<b>42.2</b>	<b>27.8</b>	<b>8.1</b>	<b>5.1</b>	<b>33.2</b>
94 Dominican Republic	2003	1.4	3.9	56.8	41.3	30.	14.4	51.7
108 Indonesia	2002	3.6	8.4	43.3	28.5	7.8	5.2	34.3
109 Viet Nam	2002	3.2	7.5	45.4	29.9	9.4	6.	37.
110 Kyrgyzstan	2003	3.8	8.9	39.4	24.3	6.4	4.4	30.3
111 Egypt	1999-00	3.7	8.6	43.6	29.5	8.	5.1	34.4
112 Nicaragua	2001	2.2	5.6	49.3	33.8	15.5	8.8	43.1
113 Uzbekistan	2000	3.6	9.2	36.3	22.	6.1	4.	26.8
114 Moldova, Rep. of	2003	3.2	7.8	41.4	26.4	8.2	5.3	33.2
115 Bolivia	2002	.3	1.5	63.	47.2	168.1	42.3	60.1
121 South Africa	2000	1.4	3.5	62.2	44.7	33.1	17.9	57.8
122 Tajikistan	2003	3.3	7.9	40.8	25.6	7.8	5.2	32.6
123 Morocco	1998-99	2.6	6.5	46.6	30.9	11.7	7.2	39.5
125 Namibia	1993	.5	1.4	78.7	64.5	128.8	56.1	74.3
<b>126 India</b>	<b>1999-00</b>	<b>3.9</b>	<b>8.9</b>	<b>43.3</b>	<b>28.5</b>	<b>7.3</b>	<b>4.9</b>	<b>32.5</b>
133 Lao People's Dem. Rep.	2002	3.4	8.1	43.3	28.5	8.3	5.4	34.6
<b>134 Pakistan</b>	<b>2002</b>	<b>4.</b>	<b>9.3</b>	<b>40.3</b>	<b>26.3</b>	<b>6.5</b>	<b>4.3</b>	<b>30.6</b>
<b>135 Bhutan</b>	..	..	..	..	..	..	..	..
136 Ghana	1998-99	2.1	5.6	46.6	30.	14.1	8.4	40.8
<b>137 Bangladesh</b>	<b>2000</b>	<b>3.9</b>	<b>9.</b>	<b>41.3</b>	<b>26.7</b>	<b>6.8</b>	<b>4.6</b>	<b>31.8</b>
<b>138 Nepal</b>	<b>2003-04</b>	<b>2.6</b>	<b>6.</b>	<b>54.6</b>	<b>40.6</b>	<b>15.8</b>	<b>9.1</b>	<b>47.2</b>
139 Papua New Guinea	1996	1.7	4.5	56.5	40.5	23.8	12.6	50.9
149 Lesotho	1995	.5	1.5	66.5	48.3	105.	44.2	63.2
151 Zimbabwe	1995	1.8	4.6	55.7	40.3	22.	12.	50.1
165 Zambia	2002-03	2.4	6.1	48.8	33.7	13.9	8.	42.1
166 Malawi	1997	1.9	4.9	56.1	42.2	22.7	11.6	50.3
174 Burkina Faso	2003	2.8	6.9	47.2	32.2	11.6	6.9	39.5
175 Mali	1994	1.8	4.6	56.2	40.4	23.1	12.2	50.5
176 Sierra Leone	1989	.5	1.1	63.4	43.6	87.2	57.6	62.9
177 Niger	1995	.8	2.6	53.3	35.4	46.	20.7	50.5

Thus the evidence indicates that the poor countries, especially the south Asian countries have not been catching up with the rich countries over the period 1980-85 to 2004-05. in terms of per capita income, the chosen index of economic welfare, the gap between the developed and developing areas of the world has not narrowed during the period. Again, according to both the Gini coefficient and the Theil index inequality across the countries has increased slightly. This finding is consistent with the study on this issue.

It can be interpreted that, despite the rapid economic growth experienced by some developing countries, the developing economies as a whole have not been able to close the gap. Here it can be mentioned that the combined population of the East Asian miracles, are not large enough to significantly affect the global income distribution and at the same time, for every development miracle, there has been one or more disaster.

[This study will make a methodological contribution toward the empirical analysis of international income inequality. The indices of global inequality provide a convenient one number summary of the extent of inequality across the countries. Those indices are designed to measure inequality among countries rather than individuals since they are based on the assumption that there is perfect income equality within each country – if all the countries of the world had identical per capita incomes, the global indices would indicate perfect equality for the world. This method can readily be applied for other smaller geographical context]

## **7.6: INEQUALITY AT THE GLOBAL LEVEL**

Now we consider the situation for the world as a whole. The data provides a clear idea in this respect. From the following table it is seen that the level of personal income growth showed a decreasing trend in the 1990-2000 than the earlier decade and projected growth for 2000-2015 is much more equitable. The maximum growth will occurred in the range between Decile 2 to Decile 7, where the South Asian countries fall.

**TABLE 7.13: GLOBAL INCOME GROWTH BY DECILE**

Source : World Development Indicators, World Bank, 2005

	CUMULATIVE				
	1970-80	1980-90	1990-2000	2000-2015	1970-2000
Decile 1	7.50%	18.40%	11.60%	45.90%	42.10%
Decile 2	9.60%	27.10%	20.70%	60.80%	68.10%
Decile 3	10.50%	29.70%	23.20%	64.70%	76.60%
Decile 4	10.40%	29.40%	23.70%	65.50%	76.80%
Decile 5	8.90%	26.80%	21.70%	64.90%	68.10%
Decile 6	5.30%	16.50%	16.20%	62.60%	42.60%
Decile 7	5.10%	-1.40%	1.60%	57.70%	5.30%
Decile 8	13.70%	-0.10%	-9.60%	45.00%	2.60%
Decile 9	19.40%	8.40%	0.90%	30.10%	30.60%
Decile 10	20.70%	18.60%	11.20%	29.90%	59.20%
<b>Mean Income</b>	17.10%	13.20%	7.10%	36.60%	42.00%
<b>Median Income</b>	7.90%	23.90%	19.90%	64.20%	60.20%

**TABLE 7.14: INCOME LEVELS BY DECILE, 1970-2015 (PROJECTED FOR 2015)**

Source : World Development Indicators, World Bank, 2005

<i>(in 1999 PPP dollars)</i>					
	1970	1980	1990	2000	2015
Decile 1	205	220	261	291	425
Decile 2	343	376	478	577	928
Decile 3	470	519	673	829	1,365
Decile 4	630	696	901	1,115	1,846
Decile 5	878	957	1,213	1,477	2,436
Decile 6	1,404	1,478	1,723	2,002	3,256
Decile 7	2,778	2,920	2,879	2,926	4,615
Decile 8	4,999	5,682	5,676	5,129	7,439
Decile 9	8,348	9,964	10,800	10,901	14,183
Decile 10	18,895	22,808	27,057	30,081	39,081
<b>Mean Income</b>	3,895	4,562	5,166	5,533	7,557
<b>Median Income</b>	1,061	1,144	1,418	1,700	2,791

The above two tables describe the world income situation both in absolute terms and in percentage growth terms. [Source: WDR 2005].

Here we consider the poverty level and the poverty gap for the world as a whole. The data are provided region wise, dividing the world into 5 groups according to the level of income.

**TABLE 7.15: COMPOSITION OF WORLD POOR BY REGION (2001)**

	WORLD	OECD	LAC	EAP	SAS	AFR	EEC
<b>below \$700</b>	998.4	0	40	149.7	391.9	415	1.8
<b>below \$1,400</b>	2,342.70	0	109	757.9	911	541.6	23.2

**TABLE 7.16: AVERAGE INCOMES OF THE POOR AND POVERTY GAP (2000)**

<b>AVERAGE INCOMES OF THE POOR AND POVERTY GAP, 2000, distr.-neutral scenario</b>							
	WORLD	LAC	EAP	SAS	AFR	EEC	
<i>pop. share, %</i>							
700	17.02%	7.78%	8.09%	28.90%	53.79%	0.38%	
1,400	39.93%	21.20%	40.95%	67.18%	70.20%	4.90%	
<i>inc. share, %</i>							
700	1.31%	0.58%	1.87%	10.65%	10.21%	0.04%	
1,400	5.60%	2.89%	16.51%	40.51%	19.59%	1.04%	
<i>inc. of group</i>							
700	426	457	550	479	329	578	
1,400	777	832	961	783	483	1,077	
<i>poverty gap</i>							
700	39.10%	34.70%	21.40%	31.60%	53.10%	17.50%	
1,400	44.50%	40.60%	31.40%	44.00%	65.50%	23.10%	

As poverty for OECD and EEC regions [defined as PPP \$700 in PCE (Personal Consumption Expenditure, as defined in WDR 2005) terms] is negligible, the main attention was paid to other regions. Both absolute poverty and poverty incidence were studied for two scenarios: (1) distribution-neutral growth, 2000-2015, and (2) pro-poor growth, 2000-2015. [Source: WDR 2005]

- (1) **Distribution Neutral Growth, 2000-2015.** For EAP and SAS regions the time needed to halve poverty was found to be 9 and 10 years, respectively, for poverty incidence, and 8 years for both regions for absolute poverty. For Africa and LAC, under the current assumptions, both absolute poverty and poverty incidence cannot be halved earlier than 30 years. At the global level, absolute poverty will be halved in 15 and poverty incidence in 24 years.

- (2) Pro-Poor Growth, 2000-2015. This scenario improves the situation markedly. For EAP and SAS regions the time needed to halve poverty was found to be 4 and 5 years, respectively, for poverty incidence, and 4 years for both regions for absolute poverty. For Africa and LAC, under the current assumptions, poverty incidence will be halved in 30+ and 18 years, respectively, and absolute poverty will be cut in half in 22 and 14 years, respectively. At the global level, absolute poverty will be halved in 9 and poverty incidence in 10 years.

The following table shows this. [Source: WDR 2005.]

	Time to halve poverty (years)			
	Poverty incidence		Absolute poverty	
	<i>DNG</i> 2015	<i>PPG</i> 2015	<i>DNG</i> 2015	<i>PPG</i> 2015
<b>WORLD</b>	<b>24</b>	<b>10</b>	<b>15</b>	<b>9</b>
Latin America	30+	18	30+	14
East Asia	9	4	8	4
South Asia	10	5	8	4
Africa	30+	30+	30+	22

It is quite remarkable that positive growth does not automatically guarantee a decrease in absolute poverty. The Box below explains how this can be possible.

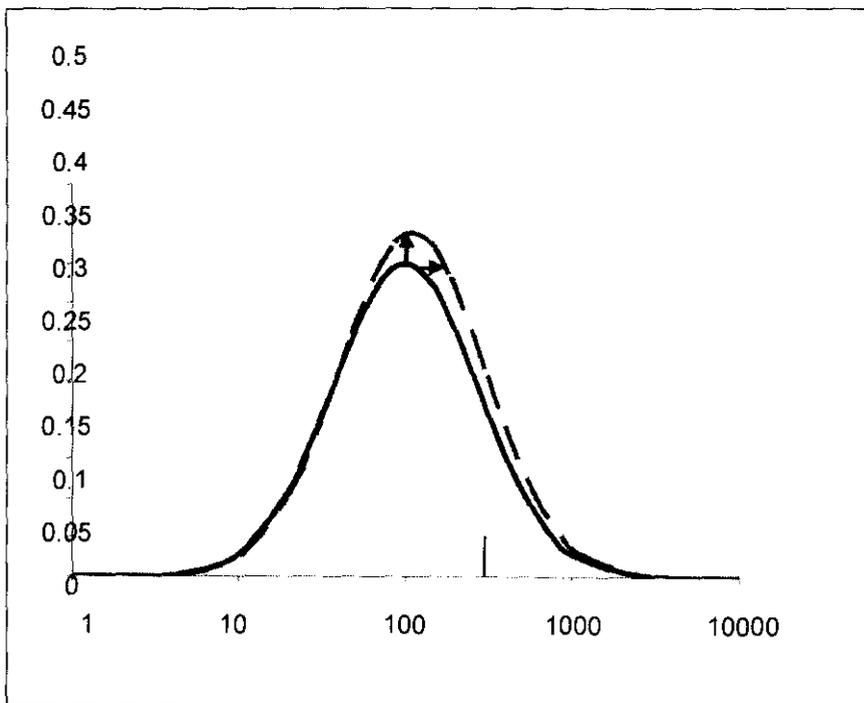
Now illustrates the situation when income growth is not sufficient to decrease numbers of the poor. Two transformations are being applied to the original log normal distribution (solid line): [ FIG. 7.9] a horizontal shift equivalent to an income growth, and a scaling up shift equivalent to a population growth. As elsewhere, the horizontal axis corresponds to income and the vertical axis is the distribution density function in logarithmic terms.

In the case when the poverty cut off line is above the median, the income growth may not be enough to crowd out poverty. The exact results depend on the distribution characteristics. For example, for the log normal distribution, if the following is true.

$$d \ln P > d \ln x \frac{F'_x(x_p)x_p}{\int_0^P F'_x dx}$$

Where  $x_p$  is the poverty line, and  $P$  is population, the income growth will not be sufficient to crowd out poverty.

FIG: 7.9: INCOME GROWTH AND INEQUALITY



## ECONOMIC GROWTH AND INCOME INEQUALITY:

Economists have long sought to understand the link between economic growth and income distribution. The main issue listed below, have important policy implications for developing countries:

- In countries with low levels of development, does economic growth result in a more unequal distribution of income, and is it necessary for per capita income to reach a certain minimum level before income inequality begins to decrease?

- Do countries with unequal income distributions experience slower economic growth than more egalitarian countries?

- Should governments consider adopting redistributive policies to improve the situation of the poor?

### 7.7: WHY DOES THE LINK MATTER

Different assumptions about the links between growth and inequality produce different outcomes for the poor, as illustrated above. The base scenario, represented by the top line, assumes an egalitarian economy where the poorest group's share of total income does not change over a 60-year period. In this case, economic growth (we assume a rate of 4 percent a year) would raise the incomes of the poor.

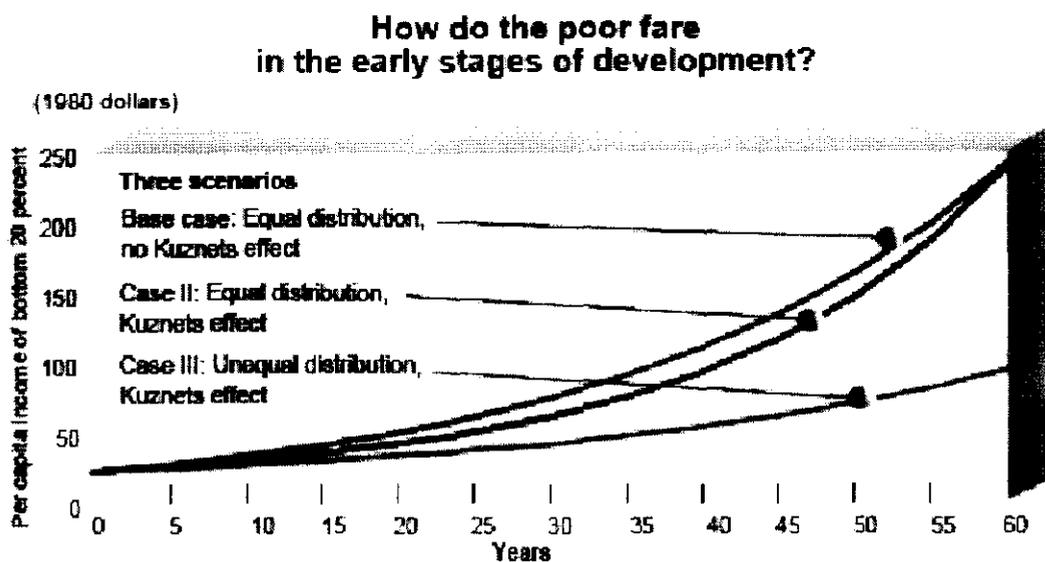
The second scenario (represented by the middle line in Chart 1) is based on the famous Kuznets hypothesis, first formulated by Simon Kuznets more than 40 years ago. This hypothesis suggests that, at low levels of per capita income, inequality increases with rising per capita income and decreases only in the later stages of development—resulting in an inverted U-shaped relationship between per capita income and income inequality—based on a model where individuals migrate from a low-wage rural sector with little inequality to an urban sector characterized by high income inequality and high average income. In this scenario, the poorest group's share of total income would decrease as economic growth takes off and would not be restored to initial levels for 60 years; as a result, the poor's per capita incomes are lower by an average of 10 percent over two generations.

Recent research has also identified a negative relationship between initial inequality and subsequent growth (see Deininger and Squire, 1996). The scenario represented by the bottom line in Chart 1 assumes a significantly higher level of initial inequality—20 points higher in terms of the Gini coefficient. (The Gini coefficient, a measure of the extent to which actual income distribution in a country differs from a hypothetical uniform distribution, goes from 0, for absolute equality, with each individual or household receiving an identical share of income, to 100, which indicates that one person or household receives all the income.) In this scenario, the rate of annual income growth would drop to 2.7 percent, and, at the end of our hypothetical

60-year period, the per capita income of the poor would be less than half of what it would be in an economy that had started off with a more egalitarian distribution. This would be true even if the Kuznets hypothesis did not hold.

Such large differences in outcome have far-reaching implications for government policies. However, these simulations draw on available empirical analysis, much of which suffers from an important shortcoming—it is based on a very limited amount of data, and these data are often of unacceptably low quality.

FIG. 7.10: STAGES OF DEVELOPMENT AND INCOME DISTRIBUTION



### The data

To be acceptable, data on income distribution need to satisfy three criteria. *They should be based on nationally representative surveys* rather than synthetic estimates built up from national accounts data and general assumptions regarding the distribution of income across occupations or in other countries at a similar stage of economic development. Such synthetic estimates, prevalent in early studies, are unacceptable, since they presuppose the existence of the relationships that are to be tested in subsequent empirical analysis.

*They should cover the entire population* rather than subsets, such as urban or rural dwellers. Partial coverage, which is often misleading, is particularly common in Latin America, where many countries collect information only for the urban population. In Peru, for example, the Gini coefficient for rural households is 32, compared with 42 for urban households. In South Africa, the Gini coefficient for the white population is 48, compared with 62 for the whole population.

They should encompass all types of income, including nonwage *income* and income from household production. As tax records and labor force statistics are more commonly available than detailed data from household surveys, many of the figures used in the literature refer to wage or taxable income. We found that this generally overstates the Gini coefficient by about 15 points and, to the degree that data on wage income in the early years are complemented with data on total income in later years, may give the appearance of a spurious decrease in inequality. Own production is particularly important for low-income groups in developing countries. Even in Greece, in 1974, household production (e.g., of vegetables and clothing) accounted for more than 70 percent of the income of the lowest decile of the population. Whether or not own consumption is included will, therefore, have considerable impact on the inequality measure obtained.

Although the above criteria are easily agreed upon in principle, applying them consistently to the available data reduces the number of “acceptable” observations to point where meaningful empirical analysis is no longer possible. To overcome these constraints, we adopted a two-pronged strategy. On the one hand, we expanded the data set on income distribution by adding new observations from primary survey data, official statistical publications, and research papers. This enabled us to increase the number of acceptable observations. It also yielded 58 countries for which 4 or more consistently defined observations are available, thus for the first time allowing at least some inferences regarding changes over time of income distribution within countries. However, it did not solve the problem of limited data availability for the 1960s, which makes it difficult to assess the impact of initial income distribution on subsequent growth.

To deal with this shortcoming, we complemented our data on income inequality with information on the distribution of land holdings, which provides a better measure of initial distribution. Information on the distribution of land in 1960 is available for a much larger number of countries (73) than is information on the initial distribution of income(12). It is attractive also from a conceptual point of view, because it gives us a solid indication of asset distribution and thus enables us to make inferences regarding access to formal credit. [Source: WDR 2005]

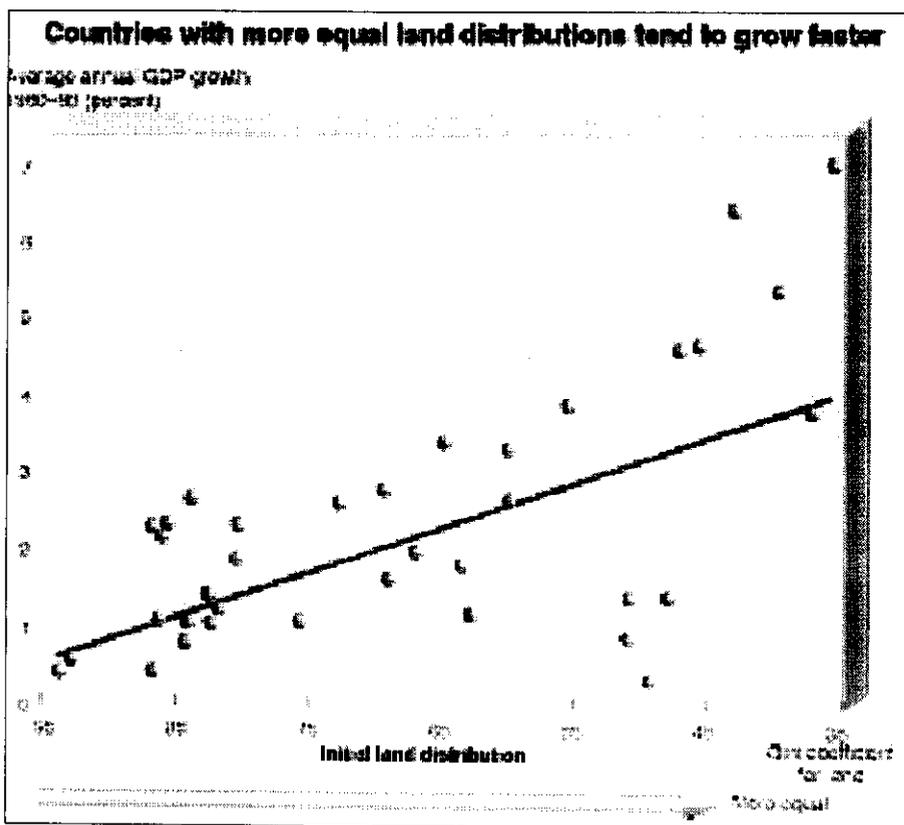
### **What do the data reveal**

First, income inequality is much greater in Latin America and sub-Saharan Africa, which have Gini coefficients in the upper 40s, than in East and South Asia, which have Gini coefficients in the middle-to- upper 30s. The OECD countries, in general, have relatively egalitarian distributions of income, with Gini coefficients around 30, while the Eastern European countries have historically had very low Gini coefficients. Measures of inequality tend to be quite different across regions but to remain relatively stable within

regions and individual countries, regardless of the considerable changes in aggregate income that have taken place.

Second, land distribution and income distribution are not the same. India, Indonesia, and Korea are all characterized by Gini coefficients for income in the 30s, but the coefficients for land distribution are 63, 55, and 35, respectively. Similarly, Thailand, Tunisia, and Peru all have Gini coefficients for income in the 40s, but the coefficients for land distribution are 45, 64, and 93, respectively. This suggests that tests of the negative relationship between initial inequality and subsequent growth may yield different results depending on whether initial inequality is measured in terms of income or land.

Third, aggregate measures of distribution may hide movements in the incomes of different groups. Thus, the observation that overall inequality may remain relatively stable over time can be consistent with considerable change in the shares of total income received by individual groups. And since we are primarily interested in assessing the impact of economic growth on poor, it is important to complement the analysis of overall changes in income with a more detailed assessment of the welfare of the bottom quintiles of the population. The following figure shows this.



## Results

Now we consider the following three questions on inequality.

***Does inequality increase in the early stages of development and then decline, as predicted by Kuznets?***

The Kuznets hypothesis has spawned a vast empirical literature, much of it driven by concern that development hurts the poor. Empirical analysis of this issue has been hampered not only by the quality of the underlying data but also because what is really a relationship over time has, for lack of data, usually been tested using cross-country evidence. Researchers have used variations in per capita incomes across countries to represent increases in per capita income over time within a country. Using our data, we are able to test for the Kuznets curve within countries and find no evidence of it in almost 90 percent of the cases. Of course, the 30-year period covered by our data may be too short to produce the full inverted U. If this is the case, we should still expect to see inequality increasing in low-income countries and decreasing in countries with high per capita incomes, but the data confirm the presence of a linear trend in only a few countries. Even where it exists, the trend rarely conforms to the Kuznets hypothesis.

We can take the analysis one step further to make more direct inferences regarding the relationship between growth and poverty. Examining the relationship between overall growth and changes in the incomes of the bottom quintile of the population during 10-year periods, we find little systematic relationship between overall growth and changes in inequality. Periods of growth are associated with an increase in inequality almost as often (43 cases) as with a decrease in inequality (45 cases). In contrast, we find a strong systematic relationship between overall growth and growth in the income of the poorest quintile; the latter increased in more than 85 percent of 91 cases. This would suggest that even when inequality has worsened; its negative effect on the poor has been more than outweighed by the positive effect of growth.

***Do more egalitarian countries grow faster?***

If economic growth does benefit the poor, then a focus on factors that increase growth would be warranted from an equity perspective as well as from a development perspective. Recent empirical work indicates that there may be a negative relationship between initial inequality and future growth. If confirmed, this would imply that unequal economies will experience lower rates of growth and, in general, lower rates of poverty reduction.

To investigate the effect of initial inequality on long-term growth, we look at determinants of growth rates for 1960–92. Because acceptable data on income inequality prior to 1960 are scarce, we use country averages of observations for the entire period. We also use the distribution of land, for

which more observations of acceptable quality are available before 1960. While the results confirm a negative link between initial *income* inequality and subsequent growth, they suggest that this relationship is not very strong. By contrast, initial inequality of assets, as measured by the distribution of land, exerts a significant negative effect on subsequent growth [Figure at page223]. Only 2 of the 15 developing countries with a Gini coefficient for land distribution in excess of 70 grew more than 2.5 percent annually during 1960–92.

What are the mechanisms through which an unequal initial distribution of assets or income might affect subsequent growth? One possible mechanism is political, that is, poor people may vote in favor of redistributive taxes that reduce investment incentives. If this were the case, one would expect higher taxes and lower investment in democratic—but not in undemocratic—countries with a more unequal distribution of income. The evidence does not support this theory, however. Clearly, other forces are at work.

A second possible mechanism is that the effects of inequality—primarily of assets—are transmitted through financial markets. Access to credit is conditional on ownership of assets for example, land, that can be used as collateral. If certain investments in physical or human capital (for example, in basic education) are affected by individuals' access to credit markets, then the distribution of assets in an economy, in addition to the mean income, will determine how many individuals are able to undertake such investments. In more unequal economies, fewer individuals would be able to make such investments, resulting in lower stocks of human and physical capital and, as a consequence, lower growth. Two pieces of evidence provide support for this line of argument. First, although initial (land) inequality is an important factor reducing future growth in developing countries, it does not have a significant effect in OECD countries.

In the latter, poverty is rarely a reason for non-attendance of primary schools; per capita incomes are higher, so that even relatively poor households can finance a broader range of investment without recourse to credit; and land is less important as a form of collateral. Second, we find that initial (land) inequality is significantly and negatively related to the average educational attainment in the population. Thus, the evidence suggests that credit markets, not the political system, should be seriously considered as a mechanism through which inequality slows economic growth.

***Should policymakers seeking to reduce poverty redistribute existing assets or create new ones?***

Our analysis shows that the poor generally benefit from growth-enhancing

policies, specifically investment. It also suggests that, given the growth-reducing effect of initial inequality, the poorest groups in a country may benefit from redistribution. What is the relative importance of accumulation compared with redistribution?

Initial land inequality [as well as income inequality, as land is the primary source of income in the developing economies] has a significant impact on income growth for all population groups except the top quintile. But investment, which is associated with significantly higher income growth for all groups, appears to have an even greater impact on the income of the poor. Although increased investment coupled with a redistribution of assets would appear to provide the greatest benefits to the poor, pursuing a redistributive strategy at the expense of investment could actually decrease the income of the poor. Therefore, in situations where redistribution of assets is either not feasible for political reasons or too costly, creation of new assets would be a more promising avenue for improving the welfare of the poor.

Using a new and improved cross-country data set on inequality to examine the dynamics of growth and poverty reduction, we reached three main conclusions:

First, while policymakers should certainly pay attention to the distribution consequences of different policy options, the fear that economic growth on its own will have a systematic negative effect on the distribution of income is unfounded.

Second, unequal distribution of assets, more than of income, can be an impediment to rapid growth, implying that redistributive policies that enhance people's access to credit markets and, thus, their ability to invest could contribute to growth.

Third, although redistributive policies have the potential to benefit the poor both directly and indirectly, they will do so only if redistribution does not jeopardize investment—this may be one explanation for the observation that, in the past, redistributive policies such as land reform have often failed to help the poor. If countries want to implement redistributive policies, their ability to devise mechanisms that would at the same time maintain or increase investment incentives may well determine whether such policies help with poverty reduction.