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CHANGES IN THE WORLD DISTRIBUTION OF INCOME BETWEEN 1950 AND 1977

Albert Berry, Francois Bourguignon and Christian Morrisson

Trends in the world distribution of income are much discussed and philosophised about. The issue of increasing economic inequality among non-socialist countries in the post-war period is central to the debate about the International Economic Order. In 1969 the Pearson Commission Report was already pointing to the 'widening gap between the developed and developing countries' as a 'central issue of our time', and was proposing the reduction of that gap as the main objective of international co-operation.¹ According to that report, GNP *per capita* had increased between 1960 and 1967 at annual rates of 2.5% and 3.6% in developing and developed countries respectively. Morawetz (1978) found that the gap between the two sets of countries rose from 12.6 fold in 1950 to 13.2 fold in 1975. Other authors see a more complicated picture. Atkinson (1975), for instance, has argued that although the share of poor countries in world income probably declined between 1950 and 1970, that of the countries at the middle of the world distribution probably increased.²

What may be a mere assessment of relative growth performances among non-socialist countries becomes a basic theoretical element in the radical stream of economic literature. For authors like Amin (1974), Emmanuel (1972), and Frank (1978), the capitalist mode of development necessarily leads to the rich countries of the 'centre' becoming richer and poor countries of the 'periphery' becoming poorer, in a degree depending on their involvement in international trade. For them, a widening gap between developed and developing countries is simply the statistical confirmation of an unavoidable consequence of the national and international capitalist system.

In the latter perspective, the issue at stake is of such importance that the contrast between the abundance of theoretical literature and the lack of empirical work is striking. The few existing studies of changes in world distribution provide an inadequate picture. Intra-country income distributions are not taken into account, observation periods do not exceed 15 years (8 for Andic and Peacock (1961) and for Beckerman and Bacon (1970), 15 for Kirman and Tomasini (1969)), socialist as well as some non-socialist countries are excluded, and national incomes are converted to U.S. dollars at official exchange rates.³ Finally, none of these studies covers the 1970s, although several shocks which might have affected world distribution occurred during that decade. For the non-socialist countries to which they refer, the Andic/Peacock and Beckerman/Bacon studies found the Gini coefficient almost constant over

¹ Commission on International Development (1969).

² We shall see that this is exactly what happened since 1950. In a study which has just come to our attention, Summers *et al.* (1981) have reached the same conclusion.

³ Except in the cited study by Beckerman and Bacon, who used proxies to estimate real consumption.

1949–57 and 1954–62 respectively, while Kirman/Tomasini reported a slight decline between 1951 and 1966;¹ in the present study, for approximately the same sample of countries, we find that it may have increased measurably (see section II).

The importance of the debate about the ‘widening gap’, and the deficiencies of past studies have led us to undertake a detailed estimation of world inequality over the most recent quarter century 1950–77. Such an estimation necessarily involves methodological, statistical and conceptual problems which prevent firm, precise conclusions on world inequality trends (Section I). When socialist countries are included, no unambiguous trends emerge for the period as a whole, regardless of whether income or consumption is the indicator of economic welfare. Among non-socialist countries there is some clear worsening when private consumption is the indicator but no clear trend when income is the measure (Section II). As the former result is partly due to increasing investment/GNP ratios in developing countries, it might (one hopes) be a transitory fluctuation in the world distribution. An innovation of the present study (Section III) is a decomposition of the changes in world inequality over the sub-periods distinguished, based on the elasticities of decomposable inequality measures like the Theil coefficient and the mean logarithm deviation (MLD).² Most changes in world inequality are essentially explained by the economic performance of the few countries which are large either in terms of population (India, China) or income (United States), and are found towards one or the other end of the ranking by *per capita* income.

I. METHODOLOGY AND DATA

A number of methodological and conceptual problems involved in estimating world income distribution at a point of time have been dealt with elsewhere.³ Here we discuss only points which seem fundamental for the chronological analysis.

Computation of the world income distribution from national data

Suppose we know for each year, t , and each country, i , included in the analysis the three following data: population, P_{it} ; average income *per capita* at constant U.S. purchasing power Y_{it} ; and percentage distribution of income by deciles, d , v_{it}^d ($d = 1, \dots, 10$). In computing the world distribution from all the P_{it} , Y_{it} , v_{it}^d , one approximation involves considering each decile d in each country i as an ‘elementary’ group of identical individuals with population and income respectively equal to $n_{it}^d = 0.1 P_{it}$ and $Y_{it}^d = 10 Y_{it} v_{it}^d$. After ranking these elementary groups by income, one may then compute the world Lorenz curve and the traditional inequality measures. This method⁴ may be cumber-

¹ We do not refer here to studies like that by Ahluwalia *et al.* (1979), which cover only a restricted set of developing countries. Nor do we refer to studies focussing only on one point of time (Whalley (1979); Theil (1979); Berry *et al.* (1981a)).

² On the decomposability of these measures see Theil (1967); Bourguignon (1979); Shorrocks (1980).

³ Berry *et al.* (1981a).

⁴ Used, for example, by Whalley (1979).

some¹ and the degree of detail involved seems unnecessary, since the world distribution is unlikely to be sensitive to relative changes in the income of groups representing far less than a thousandth of the world population. The method used here is computationally much simpler; it consists of ranking the elementary groups defined above into a restricted number of income brackets, selected so that none of them include a significant percentage of the world population. A geometric progression of approximately one hundred brackets with appropriate rate and initial value proved sufficient for no bracket to include more than 2% of the world population in the low income range and 1% in the high income range (most inequality measures are particularly sensitive to high income values). Using decomposable inequality measures, the loss of precision implied by this method has always been less than 0.2%.²

Sources of changes in the world distribution

As well as assessing trends in world inequality, we attempt to understand how they reflect changes in intra-country income distribution and disparities across countries in economic and demographic growth, such as the economic performance of newly industrialised countries (Brazil, Korea, etc.) or the demographic growth of the Indian subcontinent. We have computed the elasticities of the two decomposable inequality measures (Theil's entropy coefficient and the mean logarithmic deviation)³ with respect to national populations, national *per capita* incomes and intra-country inequalities. Let ϵ_p^i , ϵ_y^i and ϵ_T^i respectively be those elasticities for country i (their analytical expression is given in Appendix A). A first order approximation of the change in world inequality, as measured by the Theil coefficient, T , is:

$$\delta T = \sum_i (\epsilon_p^i \delta P_i + \epsilon_y^i \delta Y_i + \epsilon_T^i \delta T_i), \quad (1)$$

where δ is the growth rate operator, and T_i is the Theil coefficient for country i . The decomposition formula (1) measures the contribution of economic and demographic growth in country i to changes in world inequality assuming zero growth in all other countries. The inequality measures which are used being homogeneous of degree zero in population and income, we know that

$$\sum_i \epsilon_p^i = \sum_i \epsilon_y^i = 0;$$

hence (1) is equivalent to:

$$\delta T = \sum_i [\epsilon_p^i (\delta P_i - \delta P^0) + \epsilon_y^i (\delta Y_i - \delta Y^0) + \epsilon_T^i \delta T_i], \quad (2)$$

¹ The number of countries is approximately 130 (see the list in Appendix B) so that, for every year and under each assumption considered in the analysis, it is necessary to rank 1,300 groups of individuals according to their income.

² I.e., our approximate inequality measure, which disregards inequality within income brackets, never produced a figure more than 0.2% below the exact inequality measure, obtained through the decomposability property from countries' inequality, mean income, and population figures. We also tried to adjust simple continuous distribution functions (Log-normal, Pareto, etc.) to national quantiles but the fits were unsatisfactory.

³ Other measures could have been used but the decomposability property makes computation much easier.

where δP^0 and δY^0 are arbitrary constants. The more general formula (2) does the same as formula (1), but under the assumption that rates of growth are respectively δP^0 and δY^0 for population and income *per capita* in all countries. The calculated decomposition of changes in world inequality varies with the reference rates (δP^0 and δY^0) chosen. This choice is essentially arbitrary – it depends on the question one wishes to ask. Here we adopt reference rates equal to the mean world population and *per capita* income growth rates over the whole 1950–77 period; the arbitrary nature of the choice must be kept in mind.

Data and Assumptions

Three time series are necessary at the national level: population, a measure of *per capita* economic welfare, and a measure of intra-country economic inequality. The last two involve some statistical and conceptual difficulties. The variable traditionally used in international welfare comparisons is GNP *per capita* (i.e. output *per capita*). The merits of that variable for estimating world inequality at a point of time are debatable,¹ but its correlation over time with a more appropriate definition of national well-being is probably quite high given relatively stable national and international price structures.² An income *per capita* series for a country differs from an output *per capita* series due to changes in its international terms of trade.³ Working with a *per capita* output series for the oil-producing countries, for example, is equivalent to ignoring the international transfer of purchasing power to them due to the increases in oil prices since 1973. Since calculation of constant price *per capita* income series for all the countries in the sample was difficult, we have preferred to do the analysis at a double level, using on the one hand GNP *per capita* and on the other private consumption *per capita*. While the latter does not fully capture changes in national purchasing power, it does reflect them in part and its trend may better reflect changes in current well-being than do the trends in either GNP *per capita* or national income *per capita*.

The population, GNP *per capita* and consumption *per capita* series used in this study are from *World Tables 1980*,⁴ complemented by our own estimates for some countries in early years (1950–5).⁵ 1970 local currency values have been converted to 1970 U.S. dollars by the purchasing power parity indices estimated by Kravis *et al.* (1978) for most non-socialist countries in the analysis. 1970 dollar values for other years are based on the growth rates of GNP and consumption in constant local prices between 1970 and the year in question. Thus for any year, t , the ‘income’ (GNP) of country i has been converted to 1970 U.S. dollar purchasing power, Y_{it}^{70s} , using the formula:

$$Y_{it}^{70s} = \frac{Y_{it}^{t0L}}{Y_{i70}^{t0L}} \cdot Y_{i70}^{70L} \cdot \tau_i^{70} \cdot ppp_i^{70}, \quad (3)$$

¹ See Berry *et al.* (1981 a).

² An assumption which however is not obviously appropriate for the whole of the 1950–77 period.

³ And also to net receipts from abroad, which might have been substantial in the recent past for some oil-producing countries.

⁴ For most countries they cover 1950, 1955, 1960 and every year between 1965 and 1977. They have been supplemented by series from *World Tables 1976* for years between 1960 and 1965.

⁵ See Berry (1981 b). This paper is available on request to the authors.

where $Y_{it}^{t_0L}$ is the income of country i in year t at the prices of year t^0 in local currency, $\tau_i^{t_0}$ is the local price of the U.S. dollar and $ppp_i^{t_0}$ is the purchasing power parity index estimated by Kravis *et al.*¹ For most socialist countries, we estimated the purchasing power parity with the U.S. dollar using a variety of sources and attempting to maintain a methodological parallel with the figures of Kravis *et al.*² The validity of estimates based on equation (3) is clearly limited by the fact that the basket of goods used in the estimation of ppp may be more and more inappropriate as one moves away from 1970. The same limitation plagues the measurement of national growth rates, however, since many countries change their base years quite infrequently; not much can be done to alleviate either problem. The intra-country inequality data we use are estimates made *c.* 1970³ and we disregard changes which may have occurred over 1950–77 period. For developed countries reasonably good data indicate that those changes have been minor. In developing countries lack of adequate data is a major problem. We had at our disposal reasonably good income distribution estimates at two points of time (usually *c.* 1960 and 1970) for some 20 countries at various levels of development and representing 70% of the population of the non-socialist developing world. In one experiment we equated the change in the distribution of any given country to the average change observed in those of the 20 above-mentioned countries at the same level of development; in another we assumed unchanged distribution in each of the missing countries; in each case the effect of these intra-country changes in inequality on trends in world distribution was almost negligible,⁴ less than 0.5% for the Gini and Theil coefficients.⁵ Given this and the weak evidence on intra-country distribution trends in less developed countries, we elected to assume inequality constant in each country at its 1970 level (or as close to that year as possible).⁶ This may lead to a slight downward bias in the estimated trend of world inequality, but sensitivity analysis indicates that reasonable alternative assumptions would not alter the conclusions obtained in this paper.⁷ Note though that keeping national distributions constant is not equivalent to assuming intra-country inequality away. Intra-country inequalities give some inertia to world inequality and countries' contributions to changes in world inequality, as described by equation (2) for instance, depend very much on their own income distribution. A final

¹ The product of these last two terms is the purchasing power parity between the local currency and the U.S. dollar in 1970.

² See Berry *et al.* (1981 b), Appendix 4 a.

³ See the estimation methodology and statistical sources in Berry *et al.* (1981 b).

⁴ This result is in keeping with the dominant influence of inter-country income differences on world inequality; intra-country inequality is considerably less important. (See Berry *et al.* (1981 a).) It is also due to the modest changes in intra-country inequality indicated by our figures.

⁵ It was a little more for the mean log deviation, due to the weight of the Indian income inequality in that measure.

⁶ In the case of countries for which no reasonably good data exist on distribution, we have estimated the level of inequality on the basis of that in similar countries. (See Berry *et al.* (1981 b).)

⁷ For nearly all developing countries, including the huge ones – India and China – studies of income distribution trends are still seriously deficient. Only for a very few countries have studies persuasively demonstrated a worsening or an improvement in distribution. Pending much more empirical work, it is speculative to draw any conclusions. The better data (available for about 20 countries) suggest worsening in more countries than improvement but even this result is tentative. Unless there is some systematic bias affecting these estimated trends, our results should not be far off the mark.

assumption is that the distribution of private consumption in a given country is the same as that of income.¹

Inclusion of the socialist countries creates some problems due to their difference in national accounting procedures *vis à vis* the capitalist countries, and in some cases their weak data.² These difficulties are perhaps not too important for the U.S.S.R. and the East-European countries, all of which belong to the intermediate deciles of the world distribution. Their growth has been regular and, substantially above the world mean, throughout the whole 1950–77 period, and they have probably induced a small ambiguous reduction³ in world inequality.⁴ But the lack of solid data on China is a different matter. Given its size and low rank in the world income scale, the assumptions made about its economic and demographic growth are crucial in the estimation of world distribution trends. Two alternative estimates of Chinese economic growth since 1950 are used in the computations which follow; in both cases Chinese *per capita* GNP is taken to be about 5% below that of India in 1970.⁵ In alternative A, China's cumulative growth of *per capita* GNP between 1950 and 1977 is 220% (4.4% annually), starting 40% below India in 1950. In alternative B, the starting point is 25% below India and the cumulated growth is 130% (3.1% annually). The difference leads to distinct conclusions about world distribution changes.

II. CHANGES IN THE WORLD DISTRIBUTION OF GNP AND OF CONSUMPTION

Fig. 1 shows the evolution of inequality, both for the world and in the non-socialist countries alone, using GNP *per capita* (in 1970 U.S. dollars) as the measure of income. Because of computational costs and data gaps, the year by year evolution is reported only for the Theil and MLD inequality measures starting in 1960. The Gini coefficient and the absolute poverty index (number of persons with income less than 200 U.S. dollars, of 1970)⁶ are given for the three decade years 1950, 1960, 1970, the pre-oil boom year 1972 and the terminal year 1977.

Under Assumption A (high growth in China) there were three distinct sub-periods in the evolution of the world GNP distribution (Fig. 1 and Table 1). A

¹ In fact, consumption is generally more equally distributed than income: for an evaluation of the impact on world inequality, see Berry *et al.* (1981 *a*). Only for a few countries are data available on the distribution of private consumption expenditures.

² These problems are discussed in detail in Berry *et al.* (1981 *a*).

³ Following the theoretical literature on inequality (for instance, Sen (1973)), a change in the world distribution will be described as 'unambiguous' if it lowers or raises the whole Lorenz curve. If the whole Lorenz curve does not shift in one direction, the change will be described as 'ambiguous' even though the various summary measures of inequality may indicate a worsening or an improvement of the distribution.

⁴ Their rate of growth has been 3.8% versus 2.6% for the whole world. Increases in the relative income of intermediate deciles tend to produce an ambiguous shift in the Lorenz curve. Socialist countries' rank in the world distribution is such that in terms of conventional inequality measures, this shift is slightly equalising.

⁵ See the discussion in Berry *et al.* (1981 *a*).

⁶ This definition is that used recently by the World Bank. See, for instance, Ahluwalia *et al.* (1979).

clear-cut improvement took place in the 1950s with the bottom four deciles and the upper middle ones (especially 9) increasing their share of world income at the expense of the top decile. All summary measures of inequality fell and the world Lorenz curve unambiguously shifted upward. Then two significant increases in inequality took place between 1960 and 1968, substantially

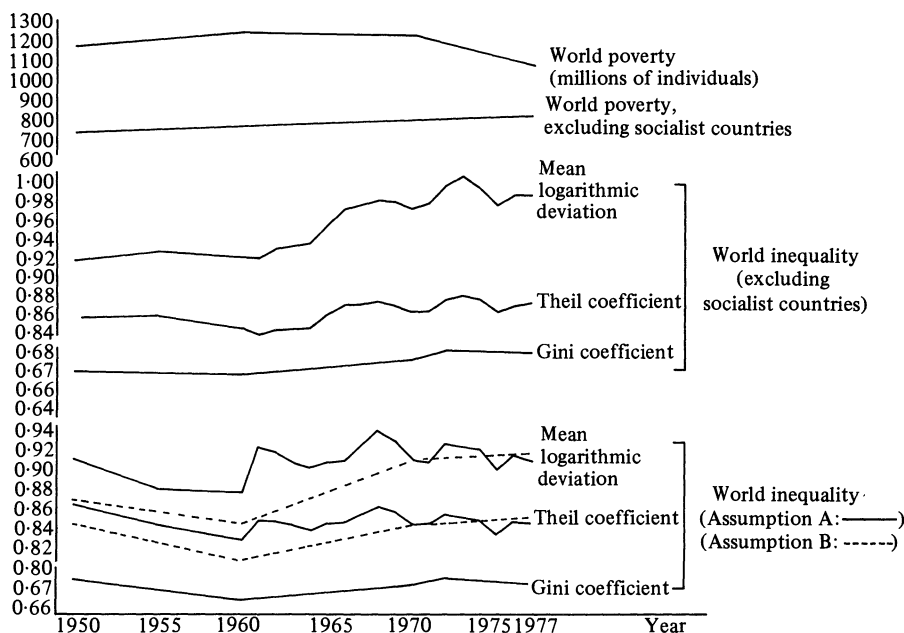


Fig. 1. Estimates are reported for years 1950, 1960, 1970 and 1977 for Poverty Measures, Gini coefficients, and other inequality measures under Assumption B (slower estimate of growth in China). Estimates are reported for 1950, 1955 and every year after 1960 for the Mean Logarithmic Deviation and Theil coefficient under Assumption A (higher estimate of growth in China).

attributable to events in China.¹ First came the disastrous crop of 1961 and the failure of the 'Big Leap Forward' policy; GNP *per capita* plunged by 22%. The second setback occurred in 1968, as a consequence of the 'cultural revolution'. Other poor countries also fared relatively less well than in the 1950s. The upper-middle deciles again increased their share of world income but this time at the expense of the bottom deciles, while the top decile maintained its share close to the 1960 level. The Lorenz curve shifted downward and in the early 1970s all the inequality measures were back around their 1950 levels. Between 1972 and 1977, another reversal occurred. The Lorenz curve shifted upward, largely because of Chinese growth, and the inequality measures showed a moderate decline. When one compares 1950 and 1977, no unambiguous conclusions can be drawn; inequality measures are more or less at the same level. The two Lorenz curves cross twice, the upper-middle deciles (8-9) and the four bottom deciles gaining at the expense of both the top decile and the lower-middle deciles (5-7). World absolute poverty, however, dropped significantly from 1.18 billion

¹ Hence, neither shows up in the series for non-socialist countries.

Table 1
World Distributions of GNP and Consumption, Selected Years. (Assumption A - Upper Estimate of Economic Growth in China)

Decile shares in world income (%):	GNP										Consumption									
	1950		1960		1970		1972		1977		1950		1960		1977					
	Shares	Cumulated	Shares	Cumulated	Shares	Cumulated	Shares	Cumulated	Shares	Cumulated	Shares	Cumulated	Shares	Cumulated	Shares	Cumulated				
1	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.8	0.8	0.9	0.9	0.8	0.8				
2	1.0	1.7	1.1	1.8	1.1	1.7	1.0	1.7	1.1	1.7	1.2	2.1	1.4	2.3	1.2	2.0				
3	1.3	3.0	1.5	3.3	1.4	3.2	1.4	3.1	1.5	3.2	1.6	3.6	1.7	4.0	1.6	3.6				
4	1.8	4.8	1.9	5.2	1.8	5.0	1.8	4.9	1.9	5.1	2.2	5.8	2.2	6.2	2.1	5.7				
5	2.6	7.4	2.6	7.8	2.4	7.3	2.3	7.2	2.4	7.5	3.1	8.9	3.1	9.3	2.7	8.4				
6	4.1	11.5	4.0	11.8	3.7	11.0	3.6	10.8	3.6	11.2	4.7	13.6	4.6	13.9	4.0	12.4				
7	6.7	18.2	6.9	18.7	6.5	17.5	6.4	17.2	6.4	17.6	7.3	20.9	7.4	21.3	6.7	19.1				
8	11.0	29.3	11.5	30.3	11.9	29.4	11.7	28.9	11.7	29.3	11.0	31.9	11.6	32.9	11.7	30.8				
9	18.1	47.4	19.1	49.4	20.1	49.5	20.2	49.0	20.2	49.4	18.3	50.2	18.8	51.7	19.3	50.2				
10	52.6	100.0	50.6	100.0	50.5	100.0	51.0	100.0	50.6	100.0	49.8	100.0	48.3	100.0	49.8	100.0				
Top 5 %	36.2	34.7	34.6	34.6	35.0	34.8	35.0	34.8	34.8	34.1	33.0	34.5								
Summary inequality measures																				
Gini	0.670	0.659	0.667	0.671	0.667	0.642	0.631	0.652												
Theil	0.867	0.828	0.844	0.858	0.846	0.785	0.750	0.807												
MLD	0.919	0.879	0.918	0.936	0.915	0.809	0.775	0.848												
Atkinson (e = -1.0)	0.726	0.711	0.727	0.734	0.726	0.681	0.665	0.697												
Atkinson (e = -1.5)	0.791	0.778	0.792	0.799	0.792	0.753	0.737	0.766												
Atkinson (e = -2.0)	0.828	0.816	0.829	0.836	0.831	0.795	0.780	0.807												
Summary inequality measures assuming no intra-country inequality																				
Gini	0.574	0.554	0.559	0.564	0.558	0.533	0.515	0.536												
Theil	0.579	0.538	0.553	0.564	0.548	0.489	0.455	0.503												
MLD	0.625	0.582	0.616	0.633	0.609	0.515	0.478	0.543												
Poverty																				
Absolute (millions of individuals with less than U.S. \$ 200)	1,178	1,249	1,226	1,177	1,043	1,297	1,478	1,666												
Relative (%)	48.5	42.4	34.2	31.6	25.5	53.4	50.2	40.8												

individuals in 1950 to 1.04 billion in 1977, most of the change occurring in China over the last seven years (world poverty had increased by approximately 50 millions between 1950 and 1970).

Under Assumption B, with a slower growth of China's *per capita* GNP (3.1 % per year), there is again no clear trend in the world distribution although some indicators (e.g. MLD) show a measurable increase in inequality (Fig. 1). The absolute number of poor people is more or less stable throughout the whole period and the same is approximately true for the relative income of the poorest to the richest half of the world population, which fluctuates around 1:12.

The evolution of the world distribution of private consumption expenditures generally follows that of GNP,¹ but the worsening between 1960 and 1972 is much more pronounced with the result that the 1977 distribution is unambiguously more unequal than that of 1950 (see Table 1). The main source of this difference with the GNP distribution trend lies in differences across countries in the behaviour of the consumption to GNP ratio. After 1960 that ratio decreased markedly in almost all non-socialist developing countries (the average for this group of countries fell from 72.0% in 1960 to 67.5 % in 1977) while remaining relatively stable in most developed countries, and rising in the United States from 60.5 % in 1960 to 63.8 % in 1977. The equalising effect on the world distribution of consumption of the higher consumption to GNP ratio in the developing world was thus largely eroded during this period.

An important issue, then, in deciding whether the trends in the distribution of private consumption expenditures are more or less relevant than those of GNP is the interpretation given to the evolution of the private consumption/GNP ratio in the less developed countries. Their decline in the share of private consumption is approximately matched by an increase in the share of gross domestic investment. By 1978 the gross investment to GDP ratio in lower income countries had about caught up with that of the industrialised countries (at 0.21 or 0.22), though still lagging behind that of middle-income developing countries (0.25).² This could imply that the worsening of the world distribution of private consumption observed since 1960 will reverse itself in the future, though the continuing loss of ground by poorer non-socialist countries (see below), even in the 1970s when their investment levels were high, indicates that this is far from obvious. Also, it must be noted that public consumption expenditures in these latter countries have risen in relation to GDP and in the 1970s the foreign resource balance has become more negative.³ In any case, in

¹ As noted above, our assumption that the distribution of private consumption is the same as that of income in each country leads to some upward bias in our estimates of world inequality of consumption; the bias is not likely to be large however, nor is there any reason to believe that the trends we estimate would be significantly affected by use of this assumption. Since public expenditures also contribute to the current well-being of a country's citizens, it would have been better to consider total instead of only private consumption expenditures especially since the ratio of public to private consumption does vary across countries and in particular between socialist and capitalist countries. Lack of information on the distribution of the benefits of public consumption severely hampers any such attempt. The available information on the rate of growth of public consumption by groups of countries does suggest that its inclusion would not alter the results significantly.

² See World Bank (1980*b*), table 5.

³ See World Bank (1980*b*), tables 4 and 5.

terms of our direct objective of measuring trends in economic inequality between 1950 and 1977 the distribution of private consumption is probably a better measure than that of GNP,¹ so the likelihood that a meaningful worsening occurred is high.

The preceding conclusions on the evolution of world inequality emerge more clearly for the non-socialist world by itself. As rapid economic growth in China was, under assumption A, a strong equalising factor in the world distribution, its exclusion lessens the tendency toward GNP equality at the beginning and the end of the 1950-77 period. At the same time, it eliminates the sharp fluctuations which were observed in 1961 and 1968. (See Table 2 and Fig. 1.) The 1950s and early 1960s exhibit a relative stability, possibly a slight decline in inequality; between 1964 and 1972 there was a substantial worsening; finally, during 1972-77 there was again no trend despite a sharp fluctuation in 1975. For the period as a whole distribution seems to have worsened somewhat, with the change concentrated in the sub-period 1964 to 1972. Since summary inequality measures like those used here involve specific social welfare judgments, the distribution of GNP in the non-socialist world could be unambiguously judged to have worsened only if the world Lorenz curve shifted out between 1950 and 1977. Table 2, however, shows clearly that this has not been the case. As in the case of the world as a whole, but more noticeably, the share of the upper-middle deciles increased between 1950 and 1970-2, an increase achieved only partly at the expense of the top deciles. Over the whole period 1950-77, the share of the upper-middle deciles rose by 1.8% of total income, with 1.3% coming from the bottom six deciles and only 0.5% from the richest 10%. Since the first transfer implies an increase in inequality and the second the opposite, no unambiguous conclusion can be reached on whether this distribution has worsened or not. Nevertheless, for many plausible social welfare functions (including those underlying the summary measures we use) inequality would have increased. As indicated in Table 2, the decline in share of world GNP over 1950-77 was most marked for the lowest deciles, reaching almost 20% for the first decile. Each successive decile did better (or less badly) than the next lower one up to the eighth decile.

In terms of relative consumption too, this was a 'devil take the hindmost' quarter-century in the non-socialist world. Table 2 shows a substantial unambiguous worsening between 1950 and 1977, with the three upper-deciles increasing their share of world consumption from 79.2% to 81.5% at the uniform expense of all seven lower deciles. This strengthening of the tendency toward inequality in consumption seems again mainly due to the rôle of China in the initial case where socialist countries were included. Though China's consumption/GNP ratio, like that of other developing countries, declined sharply between 1950 and 1977 (from 77% to 61% in our data), the country's

¹ One may wonder whether private consumption figures reflect better than GNP figures phenomena such as the sharp change in terms of trade associated with the oil crisis. The answer seems to be 'only partially'. OPEC countries did increase their consumption considerably faster than their GNP over 1972-7, taking advantage of the gain in their terms of trade. The increase was, however, far from reflecting the size of their additional oil income which, in fact, has been partly transferred to other countries and, in particular, rich countries.

Table 2
World Distribution of GNP and Consumption Excluding Socialist Countries, Selected Years

	GNP										Consumption					
	1950		1960		1970		1972		1977		1950		1960		1977	
	Shares	Cumu- lated shares	Shares	Cumu- lated shares	Shares	Cumu- lated shares	Shares	Cumu- lated shares	Shares	Cumu- lated shares	Shares	Cumu- lated shares	Shares	Cumu- lated shares	Shares	Cumu- lated shares
Deciles' shares in world income (%):																
Decile 1	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.8	0.8	0.8	0.8	0.6	0.6
2	0.9	1.5	0.9	1.5	0.8	1.4	0.8	1.3	0.8	1.3	1.2	2.0	1.2	2.0	1.0	1.6
3	1.4	2.9	1.4	2.9	1.2	2.6	1.2	2.5	1.2	2.5	1.7	3.7	1.6	3.6	1.4	3.0
4	1.9	4.8	1.9	4.8	1.7	4.3	1.6	4.1	1.7	4.2	2.4	6.1	2.4	6.0	2.0	5.0
5	2.6	7.4	2.6	7.4	2.4	6.7	2.3	6.4	2.4	6.6	3.3	9.4	3.2	9.2	2.7	7.7
6	4.1	11.5	4.1	11.5	3.8	10.5	3.7	10.1	3.8	10.4	4.6	14.0	4.7	13.9	4.2	11.9
7	6.2	17.7	6.5	18.0	6.3	16.8	6.3	16.4	6.3	16.7	6.8	20.8	6.8	20.7	6.6	18.5
8	10.4	28.1	10.8	28.8	11.4	28.2	11.3	27.7	11.2	27.9	10.8	31.6	11.2	31.9	11.4	29.9
9	19.8	47.9	20.0	48.7	20.8	49.0	20.9	48.5	20.7	48.5	19.3	50.9	19.3	51.2	19.8	49.6
10	52.1	100.0	51.3	100.0	51.0	100.0	51.5	100.0	51.6	100.0	49.2	100.0	48.8	100.0	50.5	100.0
Top 5%	34.5		33.8		33.8		34.2		34.3		32.7		32.2		33.9	
Summary inequality measures																
Gini	0.671		0.669		0.677		0.683		0.681		0.639		0.637		0.662	
Theil	0.857		0.846		0.864		0.881		0.877		0.767		0.759		0.826	
MLD	0.930		0.933		0.987		1.016		1.002		0.803		0.804		0.909	
Atkinson ($\epsilon = -1.0$)	0.733		0.736		0.757		0.768		0.763		0.681		0.683		0.728	
Atkinson ($\epsilon = -1.5$)	0.801		0.804		0.822		0.832		0.828		0.756		0.757		0.798	
Atkinson ($\epsilon = -2.0$)	0.839		0.842		0.858		0.866		0.864		0.801		0.802		0.839	
Summary inequality measures assuming no intra-country inequality																
Gini	0.557		0.552		0.560		0.567		0.563		0.508		0.503		0.534	
Theil	0.545		0.527		0.543		0.557		0.546		0.445		0.432		0.487	
MLD	0.581		0.579		0.627		0.656		0.638		0.454		0.449		0.545	
Poverty																
Absolute (millions of individuals with less than U.S. \$ 200)	682		702		723		733		748		772		862.1		978	
Relative (%)	42.7		36.3		30.5		29.7		27.5		48.3		44.6		36.0	

Table 3
Country Composition of Selected Quantiles of the World Distribution of GNP, 1950 and 1977

Countries and groups of countries*	Poor (GNP per Capita less than U.S. \$ 200)		Bottom 60%		Intermediate income deciles (7-9)		Top 10%		World population	
	1950 (1)	1977 (2)	1950 (3)	1977 (4)	1950 (5)	1977 (6)	1950 (7)	1977 (8)	1950 (9)	1977 (10)
Socialist economies	42.1	28.3	37.0	36.6	37.9	33.0	8.9	17.9	34.2	33.5
China †	41.8	28.3	36.3	36.5	3.7	7.9	0.0	0.0	22.5	24.0
USSR	0.0	0.0	0.0	0.0	23.1	16.6	3.8	13.4	7.4	6.3
East-European countries	0.3	0.0	0.7	0.1	11.1	8.5	5.1	4.5	4.3	3.2
Market economies	57.9	71.7	63.0	63.4	62.1	67.0	91.1	82.1	65.8	66.5
Poor countries										
Indian subcontinent	26.9	40.8	28.1	30.0	6.0	6.0	0.0	0.0	18.4	19.6
Nigeria and Indonesia	8.0	6.9	7.6	7.9	1.1	1.7	0.0	0.0	4.8	5.2
Other	8.4	14.1	7.9	8.8	1.5	1.1	0.3	0.0	5.1	5.8
Developing countries	7.1	7.0	8.2	9.8	7.1	9.7	3.0	3.2	7.3	9.1
Newly industrialised countries	3.4	1.7	5.1	3.8	4.4	10.0	2.3	5.5	4.6	5.8
Oil-exporting countries	1.9	0.6	2.1	1.6	1.3	3.5	0.9	1.8	1.7	2.3
Semi-industrialised countries										
European	0.8	0.0	1.3	0.4	3.6	3.6	1.2	2.0	2.0	1.5
Other	0.4	0.5	0.4	0.7	2.9	2.8	1.9	0.8	1.3	1.4
Industrialised countries	1.1	0.0	2.3	0.2	34.3	28.7	82.6	68.7	20.4	16.1
USA	0.0	0.0	0.0	0.0	6.2	6.9	41.3	30.9	6.3	5.3
Largest 5 west-European countries	0.4	0.0	0.9	0.2	15.4	11.7	30.0	23.8	8.3	6.1
Japan	0.7	0.0	1.2	0.0	8.4	6.3	1.7	7.3	3.4	2.8
Other	0.0	0.0	0.2	0.0	4.3	3.8	9.6	6.7	2.4	1.9

* See composition of country groups in Appendix B.

† Under Assumption A (see Section II).

above average growth permitted *per capita* consumption to keep up with (or gain on) the world mean. The opposite happened in most other developing countries, as reflected in Table 2. For the world as a whole, however, the effect of trends in China compensated, under Assumption A, for a substantial part of that unequalising force.

III. A DECOMPOSITION ANALYSIS OF CHANGES IN WORLD INEQUALITY

The preceding discussion may seem somewhat anonymous; it would be of interest to attach countries to the deciles of the world distribution. However, intra-country dispersion is normally wide enough so that a given world decile cannot be associated with specific countries, nor does a change in the share of a world decile simply reflect the fact that a particular set of countries are growing faster or slower than the world mean. Country deciles may move in or out of a world decile over time, part of the complex process which determines the evolution of the world Lorenz curve.¹ Nevertheless, a look at changes in the country composition of some world deciles helps to understand the sources of variations in the world distribution.

Table 3 provides that information for some countries and groups of countries, the latter defined by common characteristics such as GNP *per capita*, geographical or historical conditions, and rate of economic growth.² Most noticeable are: the increasing concentration of world poverty in the 'poor' (non-socialist) countries and the decreasing share of China (China, under hypothesis A, and the Indian sub-continent having exactly opposite evolutions in this respect); the substantial fall of the U.S. share in the world rich (though this is due, in large part, to the falling share of the United States in world population); and the increasing weight of China, developing, newly industrialised and OPEC countries in the world middle-income deciles.

Decomposition formula (2) based on the elasticities of Theil and MLD coefficients with respect to countries' income *per capita* and population, helps to identify in a proximate sense the various sources of change in world inequality. Table 4 summarises our estimates of how a country's (or group of countries') income and population growth performance affected world inequality over 1950-77 as a whole. Although the computations have been run for a set of relatively short sub-periods, since formula (2) is valid only locally, Table 4

¹ The complexity of the phenomena responsible for changes in the world Lorenz curve is readily apparent. Consider, for instance, the case of the USSR and Japan. In both countries, the population growth rate has been well below the world average, so their share of total population has fallen substantially (columns 9 and 10). By itself this would lower their share in all world deciles. But since their income growth rate has been much above average, they have moved up in the world decile scale. As a joint result of these two mechanisms, their share in the middle-income deciles has declined in a proportion larger than their share in world population, and their share in the top 10% has increased noticeably. The opposite has occurred for poor countries; their share in the world poor went up faster than their weight in the world population, and their share in middle-income deciles sometimes decreased.

² The country-composition of the groups is given in Appendix B.

Table 4
Contributions of Countries GNP and Population Growth to Changes in World GNP Inequality over 1950-77

Countries and groups of countries*	Cumulated deviation from reference growth rates † (%)		Contribution to change Their coefficient		Contribution to change in MLD		
	GNP/Capita	Population	Income effect	Population effect	Income effect	Population effect	Total ‡
Socialist economies							
China§	63.8	5.3	-7.7	2.7	-7.7	1.0	-6.4
USSR	40.7	-15.8	-0.4	0.3	-11.1	0.2	-10.9
East-European countries	50.3	-27.6	-0.4	1.2	2.2	0.6	2.8
Market economies							
Poor countries			1.1	2.6	8.3	-1.2	6.0
Indian subcontinent	-20.5	5.3	3.2	0.4	3.5	0.1	3.4
Nigeria and Indonesia	11.8	6.1	-0.3	0.1	-0.5	0.0	-0.5
Other	-25.2	6.9	0.7	0.2	1.3	0.1	1.4
Developing countries	-0.1	21.9	-0.0	-0.0	-0.0	-0.4	-0.5
Newly industrialised countries	50.6	26.3	-0.9	-0.2	-0.5	-0.4	-1.1
Oil-exporting countries	85.7	26.7	-0.5	-0.1	-0.3	-0.2	-0.6
Semi-industrialised countries							
European	97.6	-24.6	-0.7	0.3	0.2	0.3	0.5
Other	-18.5	1.5	-0.0	-0.0	-0.2	-0.0	-0.1
Industrialised countries							
USA	-6.7	-16.6	-2.0	-0.6	-1.6	-1.4	-2.9
Largest 5 west-European countries	21.5	-27.6	1.8	1.5	2.6	-0.1	2.3
Japan	192.7	-20.0	-0.6	0.6	3.2	0.3	3.5
Other	15.5	-23.6	0.4	0.4	0.6	0.0	0.6
Total			-6.6	5.3	0.6	-0.2	-0.4

* See composition of country groups in Appendix B.

† Reference rates are 2.8% for GNP/Capita and 2% for population.

‡ Includes changes in intra-group inequalities for small amounts.

§ Under Assumption A (see Section II).

reports each effect summed over the sub-periods.¹ Most of the results presented are for groups of countries; changes in world inequality originating in intra-group variations of inequality are then included in the 'total' columns, but tend to be small in comparison with inter-group effects.

Several interesting points emerge from Table 4. First, it appears that when taken separately, changes in relative mean incomes and relative populations across countries have ambiguous effects on world inequality. Keeping relative population size constant across countries, and allowing mean incomes to change as they did between 1950 and 1977, lowers the Theil coefficient by 6.6% but slightly increases the MLD (0.6%). Doing the opposite reveals a substantial effect of demographic changes on the Theil coefficient (+5.3%) and almost no effect on the MLD. In both cases, then, the Lorenz curves intersect. A look at country contributions helps to explain these results. On the income side, there are two unambiguous pairs of conflicting forces on world inequality. The slow growth of the poorest countries, and in particular the heavily populated countries of the Indian subcontinent, shifts the Lorenz curve downward and increases inequality whereas that of the United States, the richest country, does the opposite. Among the relatively fast growers, again, it is those most distant from the world mean income *per capita* which are most likely to affect world inequality in a substantial way. China's growth performance is by far the major equalising factor in the world distribution (under Assumption A).² At the other end of the income *per capita* spectrum, the non-socialist industrialised countries other than the United States and Japan were the main unequalising factor; although the average growth rate of income *per capita* was not much above the world mean, their weight and their high rank in the world distribution are sufficient to produce a significant worsening.

Between those extremes, we find three types of situations. The fast growth of the newly industrialised and OPEC countries contributed only moderately, although unambiguously, to world equality. The economic performances of the East-European countries, USSR and Japan have a different impact on world inequality depending on what measure, i.e. what underlying social utility function, is selected. Finally, other country groups have a negligible effect on the world distribution, either because their *per capita* GNP increase was too close to the world mean or because they are too small.

The direct³ effects of demographic phenomena on world inequality are simpler. Population has grown much faster in poor and middle-income

¹ In equation (2) the contributions of changes in country *i*'s income *per capita* and population to the change in inequality over a sub-period *t* are given by

$$C_{y_i}^t = \epsilon_{y_i} (\delta y_i - \delta y^0) \quad \text{and} \quad C_{n_i}^t = \epsilon_{n_i} (\delta n_i - \delta n^0)$$

respectively, with δy_i and δn_i being taken over the sub-period *t*. Table 4 thus gives the sum of the $C_{y_i}^t$, $C_{n_i}^t$ over the whole 1950-77 period.

² Under Assumption B (slower increase in China's income *per capita*), China's contribution to changes in world Theil and MLD would fall respectively to about -1.8% and about -2.9%. Though still having the largest single negative effect of any country on MLD and a comparable effect to that of the United States on the Theil coefficient, China's experience is much less dominant under this assumption.

³ 'Direct' in the sense that no account is taken of the interactions between population growth and growth of *per capita* income.

countries than in rich countries. This necessarily shifts the bottom of the Lorenz curve upward and the top downward so that the net effect on world distribution is ambiguous. Since the Theil coefficient is more sensitive to changes at the top of the curve, it is pushed sharply upward, whereas the MLD is almost unaffected.

In synthesis, the main proximate sources of change in the distribution of world GNP between 1950 and 1977 are: (i) the faster demographic growth in poor and developing countries produced an ambiguous effect on the Lorenz curve and inequality measures; (ii) the slow economic growth of poor countries apart from China – India being by far the most important – and the above average growth of non-socialist developed countries, United States excluded, increased inequality; (iii) the below average growth of the United States and the fast growth of China and some developing countries (the OPEC and NIC groups) lowered world inequality. Under Assumption A (fast economic growth in China) the third effect dominates the second. But, because developments in other countries have ambiguous effects, no clear conclusion can be reached as to how world inequality changed.¹ This is the more true if Assumption B, of slower Chinese growth, is retained.

Although technically the same ambiguity remains when the analysis is restricted to non-socialist countries, many welfare criteria (including those implicit in all the summary measures we use) indicate a worsening in that case. And if one focusses on absolute poverty the conclusion is unambiguous. The slow economic growth of the poorest countries, associated with the rapid increase of their populations, led to an increase in the absolute number of poor persons (income below 200 1970 U.S. dollars) from 680 millions in 1950 to 750 millions in 1977 (Fig. 1). While the share of total population in poverty does show a marked decline (43 % to 28 %), it is alarming to see that the absolute number of poor was still growing between 1972 and 1977. Likewise, the increasing gap between the lower and the upper halves of the non-socialist world population is worrying. Although it has levelled off since 1972, it moved from 1:12.5 in 1950 to 1:14.6 in 1972.²

Finally, the specific and limited meaning of the decomposition presented in Table 4 must be emphasised. Such a decomposition does not constitute a causal analysis of the distributional effects of demographic or economic developments. A causal analysis would require a model of the relationship in each country between population growth and the growth of *per capita* GNP. With such a model, formula (2) can once again be employed. Consider the impact of a slower rate of population growth in the Indian subcontinent, for example a growth of 1.2 % per year instead of the actually observed 2.2 %. If one assumed an output elasticity of population growth of 0.33 %, the decrease in population growth of 1 % per year would have lowered the growth of output by 0.33 % per year, and raised the growth of *per capita* output by 0.67 % per year. As a result the subcontinent's income effect on the world Theil would be only +0.8 %

¹ Of the six summary measures we use, three (Gini, Theil and MLD) fell, two were essentially unchanged, and one (Atkinson, $\epsilon = -2.0$) rose. But all the changes were quite small.

² As noted above, this gap remains approximately constant when socialist countries are included.

instead of +3.2%, while the population effect would become -1.3% instead of 0.4%. The total effect would be -0.5% instead of 3.7% and the Theil coefficient for the world would have fallen 6.3% instead of 2.1%.¹

To summarise: the above average growth of population in the Indian subcontinent could be said to be the 'cause' of a 0.4% increase in the world Theil (as per Table 4) were there no causal relation between that growth rate and *per capita* income growth. But with an output elasticity of population growth of 0.33 it could be blamed for an increase of about 0.7%. With the same elasticity assumption but a population growth rate for the subcontinent of 1.2% per year, the fact that that rate was lower than the world average of 2% would lower the world Theil by 4.2%, as noted above.

IV. SUMMARY

Over the quarter century 1950-77 our data indicate that the distribution of world GNP was essentially unchanged, while that of private consumption became more unequal, judging by the summary measures used here. The difference between the two patterns reflected the decreasing private consumption to GNP ratios in the lower income countries as a group. The 1950s saw improvement, 1960-72 worsening and 1972-7 a slight improvement. Developments in China were the main factor underlying these differences across sub-periods, and the rapid growth of this country was a major equalising factor for the quarter century as a whole. Within the non-socialist camp, there was some increase in the inequality indicators for GNP, and a larger increase in those for consumption; the big gainers were the eighth and ninth deciles, while the bottom six deciles all lost. The slow growth of *per capita* income in the Indian subcontinent was the main single factor in this latter development, while the rapid growth of such middle income countries as Japan, Russia and (at a lower level) Brazil underlay the gains by the 'middle' against both the top and the bottom.

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APPENDIX A. NOTE ON ELASTICITIES OF THEIL AND MLD COEFFICIENTS

Let v_i and w_i be the shares of country i in world income and population respectively. Theil and MLD coefficients write:

$$T = \sum_i v_i T_i + \sum_i v_i \log (v_i/w_i), \quad (1)$$

$$L = \sum_i w_i L_i + \sum_i w_i \log (w_i/v_i), \quad (2)$$

where T_i and L_i are respectively Theil and MLD coefficients for the

¹ These calculations are approximate, using the 1950-77 average Theil elasticities implicit in Table 4.

distribution of income within country i . v_i and w_i can be expressed as the following functions of population sizes, n_i , and mean incomes, y_i :

$$v_i = n_i y_i / \sum_j n_j y_j \quad w_i = n_i / \sum_j n_j. \quad (3)$$

Differentiating now, (1), (2) and (3) with respect to the n_i , y_i , T_i and L_i , yields the following elasticities of T and L .

$$\left. \begin{aligned} \epsilon_{y_i}^T &= \frac{v_i}{T} (T_i + \log v_i/w_i - T), & \epsilon_{y_i}^L &= \frac{1}{L} (v_i - w_i), \\ \epsilon_{n_i}^T &= \frac{v_i}{T} (T_i + \log v_i/w_i - T) + \frac{1}{T} (w_i - v_i), \\ \epsilon_{n_i}^L &= \frac{w_i}{L} (L_i + \log w_i/v_i - L) + \frac{1}{L} (v_i - w_i), \\ \epsilon_{T_i}^T &= v_i \frac{T_i}{T}, & \epsilon_{L_i}^L &= w_i \frac{L_i}{L}. \end{aligned} \right\} \quad (4)$$

Ignoring within-country inequalities (T_i , L_i), income elasticities, $\epsilon_{y_i}^T$ and $\epsilon_{y_i}^L$, are positive for countries with mean income sufficiently high with respect to the world mean (\bar{y}). The ratio v_i/w_i is equal to y_i/\bar{y} , so that $\epsilon_{y_i}^L \geq 0$ if $y_i \geq \bar{y}$. For the Theil coefficient, the value above which $\epsilon_{y_i}^T \geq 0$ is higher because this requires $\log y_i/\bar{y}$ to be larger than the world average of $\log y_i/\bar{y}$, weighted by the v_i 's. So $\epsilon_{y_i}^T$ is still negative for $y_i = \bar{y}$.

The sign of population-elasticities is less easy to determine. They include two terms with eventually opposite signs. So for a high y_i/\bar{y} , the first term of $\epsilon_{n_i}^T$ (which is in fact $\epsilon_{y_i}^T$) is positive but the second is negative, whereas the opposite is true for $\epsilon_{n_i}^L$. This comes from the fact that a population increase at any extreme of a distribution implies a Lorenz curve which necessarily crosses the original one. So, the sign of the population-elasticities is ambiguous for low and high income countries. In formulae (4), it is clear that, when the ratio y_i/\bar{y} goes from zero to infinity, the elasticities ϵ_{n_i} are successively positive, negative and, positive again. Empirically, the preceding points seem to remain valid when internal inequalities T_i and L_i are taken into account.

Appendix Table B 1
*Countries Included in the Analysis**

I. NON SOCIALIST COUNTRIES

Poor countries

Indian subcontinent
 Bangladesh, India, Pakistan, Sri Lanka
 Oil-producing Countries
 Nigeria, Indonesia
 Other poor countries
 Afghanistan, Botswana, Burma, Burundi, Cambodia, Central Africa, Chad, Ethiopia, Gambia,
 Lesotho, Madagascar, Malawi, Mali, Mauritania, Nepal, Rwanda, Somalia, Sudan, Tanzania,
 Togo, Uganda, Upper Volta, Zaire

Developing countries

Barbados, Bolivia, Cameroon, Chile, Colombia, Costa Rica, Dominican Republic, Egypt, Ecuador,
 Fiji, Ghana, Guatemala, Guyana, Honduras, Ivory Coast, Jamaica, Jordan, Kenya, Lebanon,
 Liberia, Malaysia, Mauritius, Morocco, Nicaragua, Panama, Papua, Paraguay, Peru, Philippines,
 Rhodesia, Salvador, Senegal, Sierra Leone, Swaziland, Syria, Thailand, Trinidad, Tunisia,
 Turkey, Zambia

Newly industrialised countries

Brazil, Hong Kong, Mexico, Singapore, Taiwan, South Korea

Oil-exporting countries

Algeria, Gabon, Iraq, Iran, Kuwait, Libya, Oman, Qatar, Saudi Arabia, Venezuela

Semi-industrialised countries

European
 Cyprus, Greece, Ireland, Israel, Malta, Portugal, Spain
 Other
 Argentina, South Africa, Uruguay

Developed countries

United States
 Canada, France, Italy, United Kingdom, West Germany
 Australia, Austria, Belgium, Denmark, Finland, Iceland, Netherlands, New Zealand, Norway, Sweden,
 Switzerland
 Japan

II. SOCIALIST COUNTRIES

China
 Soviet Union
 Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Romania, Yugoslavia

* The following classification is self-explanatory except for a few cases. Nigeria and Indonesia have been distinguished from other oil-producing countries and classified together with poor countries, because the level of their GDP *per capita* and its structure was close to that of other poor countries throughout most of the period of analysis. The same type of argument also explains why some countries are classified as poor or developing (e.g. in terms of GDP *per capita* Ghana was much closer to other developing countries than poor countries during the 50s and the 60s). Nepal, on the other hand, could have been included in the Indian subcontinent, but we felt that for various reasons, including its demographic features, it was rather distinct from the four countries in that group.

REFERENCES

- Ahluwalia, M., Carter, N. and Chenery, H. (1979). 'Growth and poverty in developing countries.' *Journal of Development Economics*, vol. 6, no. 3, pp. 299-342.
 Amin, S. (1974). *Accumulation on a World Scale*. New York: Monthly Review Press.
 Andic, S. and Peacock, A. (1961). 'The international distribution of income.' *Journal of the Royal Statistical Society*, vol. 124, series A, pp. 206-18.
 Atkinson, A. (1975). *The Economics of Inequality*. Oxford: Clarendon Press.
 Beckerman, W. and Bacon, R. (1970). 'The international distribution of income.' *Unfashionable Economics* ed. P. Streeten, pp. 56-74. London: Weidenfeld and Nicholson.

- Berry, A., Bourguignon, F. and Morrisson, C. (1981 *a*). 'The level of world inequality: how much can one say?' Forthcoming, *Review of Income and Wealth*.
- , — and — (1981 *b*). 'Data for the analysis of the world distribution of income.' Working Paper no. 39, LEP, Ecole Normale Supérieure, Paris.
- Bourguignon, F. (1979). 'Decomposable income inequality measures.' *Econometrica*, vol. 47, no. 4, pp. 901–20.
- Commission on International Development (1969). *Partners in Development*. New York: Praeger.
- Emmanuel, A. (1972). *Unequal Exchange: A Study of the Imperialism of Trade*. New York and London: Brian Pearce, Trans.
- Frank, A. G. (1978). *Dependent Accumulation and Underdevelopment*. London: Macmillan.
- Kirman, A. and Tomasini, L. (1969). 'A new look at international income inequalities.' *Economia Internazionale*, vol. 22, no. 3, pp. 437–61.
- Kravis, I., Heston, A. and Summers, R. (1978). 'Real GDP per capita for more than one hundred countries.' *ECONOMIC JOURNAL*, vol. 88, pp. 215–42.
- Morawetz, D. (1978). *Twenty-Five Years of Economic Development: 1950–75*. Washington: World Bank.
- Sen, A. (1973). *On Economic Inequality*. Oxford: Clarendon Press.
- Shorrocks, A. (1980). 'The class of additively decomposable inequality measures.' *Econometrica*, vol. 48, no. 3, pp. 613–25.
- Summers, R., Irving, B., Kravis, I. and Heston, A. (1981). 'Inequality among nations: 1950 and 1975.' *Disparities in Economic Development Since the Industrial Revolution* (ed. P. Bairoch and M. Lévy-Leboyer), ch. 2. London: Macmillan.
- Theil, H. (1967). *Economics and Information Theory*. Amsterdam: North-Holland.
- (1979). 'World inequality and its components.' *Economic Letters*, no. 2, pp. 8–14.
- Whalley, J. (1979). 'The worldwide income distribution: some speculative calculations.' *Review of Income and Wealth*, vol. 25, no. 3, pp. 261–76.
- World Bank (1976). *World Tables*. Washington, D.C.: John Hopkins University Press for the World Bank.
- (1980 *a*). *World Tables*. Washington, D.C.: John Hopkins University Press for the World Bank.
- (1980 *b*). *World Development Report*. Washington, D.C.: John Hopkins University Press for the World Bank.