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Assessing Progress toward Greater Equality of Income Distribution

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Assessing Progress toward Greater Equality of Income Distribution

Abstract

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This chapter answers the following questions:

What are the strengths and limitations of alternative income concepts?

"Greater equality of income distribution" implies an increase in the incomes of the poor in developing countries relative to the income of the nonpoor. Relative-inequality measures dominate the existing literature on income distribution and economic development. What are the main lessons from these studies?

Is it desirable to use *relative* income measures to assess the welfare of the poor and progress of public policies in meeting objectives of equity? Are indicators based on *absolute* incomes and poverty possibly more appropriate?

Are reliable and accurate data available, on a regular basis, to measure the various indicators?

What recommendations, taking into account cost and other considerations, can be made on the reporting of recommended indicators?

Keywords

development, economic growth, labor market, education, employment, income, poverty

Disciplines

Income Distribution | Labor Economics | Labor Relations

Comments

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Assessing Progress

toward Greater Equality of Income Distribution

Gary S. Fields

Income distribution is only one indicator of economic well-being useful in gauging improvements in the economic position of the poor; change in income distribution, appropriately conceived and measured, is as good a criterion as any for assessing progress toward the alleviation of poverty. Income is intimately bound up with a family's command over economic resources. Rising modern-sector employment or reduced infant mortality might be *suggestive* of improvements in the economic position of the poor; gains in real income among low-income groups provide *direct* evidence that poverty is being alleviated.

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Are reliable and accurate data available, on a regular basis, to measure the various indicators?

What recommendations, taking into account cost and other considerations, can be made on the reporting of recommended indicators?

In the first section of this chapter we examine the usefulness of the concept of income distribution. Current income is not an ideal measure of economic welfare. It represents the best available compromise between conceptual suitability, on the one hand, and data availability on the other. Supplementary data on wealth, housing conditions, infant mortality, and other economic indicators are useful adjuncts where available.

The second section deals with alternative ways of studying the income-distributional effects of economic development. Inequality measures show up as unsuitable indicators of change in the welfare of the poor. Two families of alternative indicators, based on absolute- and relative-poverty measures, are shown to be superior. A simple numerical example demonstrates differences among the three approaches. With this as a guide, we can decide which measure is most appropriate as a criterion for assessing progress toward improving the economic position of the poor.

The next section of the chapter is a review of the literature on relative income inequality: cross-sectional relationships between income inequality and the level of development; major findings of studies of the correlates of inequality; and evidence on changes in income inequality within a given country over time. The analyses reviewed rely on the usual tools of the trade—Lorenz curves, Gini coefficients, income shares of the richest and poorest percentages—all of which measure *relative* income inequality.

The fourth section breaks new ground with a direct examination of *absolute* incomes and poverty. A family of alternative indicators is used to measure the number of persons whose incomes are less than an agreed-on poverty line and the average incomes among this low-income group. These alternative indicators suggest a markedly different assessment of the actual experiences of two countries—Brazil and India—that have so far not been subjected to absolute-poverty analyses.

The next section outlines requirements for theory and data to implement the absolute-poverty approach. In that section we also discuss the extent to which reliable and accurate data are available on a regular basis to measure the various indicators.

Income as an Indicator of Economic Well-Being

The usefulness of income equality as a criterion for assessing progress and commitment toward economic development hinges on the assumption that income is a meaningful indicator of economic position. Two standards for gauging the usefulness of the income measure are conceptual suitability, on the one hand, and data availability on the other.

Economic well-being is related to the goods and services one consumes; and consumption, in most cases, depends on income.

It is easy to think of exceptions to these generalizations: the cripple who derives less satisfaction from goods and services than the fortunate who are well-endowed physically; the young couple who receive large and frequent gifts from their parents; the rich with large asset holdings who finance their consumption out of their wealth rather than from their earnings; and the peasant family that grows and consumes its own food and has little or no

cash income deriving from the sale of a marketable surplus. In all these cases, cash income is an inaccurate measure of the individual's or family's command over economic resources. At issue is the severity of the inaccuracies, some of which are undoubtedly more worrisome than others.

Income-distribution statistics in LDCs take only some of these considerations into account. Health status and intrafamily gifts are examples of a broad range of considerations that never enter into income-distribution data. The costs of worrying about these factors far outweigh the benefits. On the other hand, adjustments for home-produced consumption and income from wealth are often made, and with good reason, since these factors together affect the economic position of large numbers of income recipients.

Income-distribution figures typically measure money income received during a month or a year. For example, the U.S. census asks for income received in the previous year, but since the census is conducted only at ten-year intervals, in the interim the census bureau regularly reports income data derived from the Current Population Survey (CPS) of some 47,000 households. Income is defined as follows:

Data on income collected in the CPS are limited to money income received before payments for personal income taxes and deductions for Social Security, union dues, Medicare, etc. Money income is the sum of the amounts received from earnings; Social Security and public assistance payments; dividends; interest; and rent; unemployment and workmen's compensation; government and private employee pensions; and other periodic income. (Certain money receipts such as capital gains are not included.) Therefore, money income does not reflect the fact that many families receive part of their income in the form of non-money transfers such as food stamps, health benefits, and subsidized housing; that many farm families receive non-money income in the form of rent-free housing and goods produced and consumed on the farm; or that non-money incomes are also received by some nonfarm residents which often take the form of the use of business transportation and facilities, full or partial payments by business for retirement programs, medical and educational expenses, etc. [U.S. Bureau of the Census 1976c]

Many economists have questioned the conceptual suitability of such figures. Taussig (1973), for instance, cites nine reasons why the standard annual money-income statistics published in the United States fail to provide an adequate measure of economic well-being; he computes alternative measures based on these adjustments. The factors considered are:

1. The census money-income measure excludes nonmonetary income receipts.
2. These figures are reported on a before-tax rather than an after-tax basis.

3. No account is taken of price differences in various cities or regions of the country.
4. Income is reported for family units defined by the census, generally with no allowance made for variations in family size or composition.
5. The figures contain no information on the distribution of net worth.
6. Data are presented for a single year; a longer time horizon might distinguish permanent from transitory components.
7. No account is taken of differences in leisure.
8. These income figures exclude capital gains, benefits from government services, and other supplements to one's income and consumption.
9. The figures are reported for the census-defined family unit rather than for a "pooling consumer unit."

In studies of LDCs, researchers have wrestled with these and other issues in seeking to arrive at a "correct" distribution of income for a less-developed country. The most eminent researcher in this area is Simon Kuznets (1963,1976); see also the work of Bronfenbrenner (1971, pp. 31-38) and Szal (1975).

From these and other writings emerge three points of consensus:

1. When appropriately defined, measured, and adjusted, income is an analytically valuable guide to economic status.
2. The family is a more appropriate recipient than the individual.
3. A number of adjustments to annual (or monthly) cash income are in order.

Of course, statistics on income (whether national, sectoral, or individual) are often seriously inaccurate. A particularly negative view is expressed by Averch, Denton, and Koehler (1970) with respect to income data in the Philippines. A less pessimistic assessment is presented by Altimir (1975) for Latin American income data, although he does point to tendencies for income reported in censuses and surveys to understate national income by 10-20 percent or more. These and other reviews of data reliability should serve as a warning to those who unquestioningly accept the authority of respected scholars and who uncritically utilize data compilations.

The usual types of figures on incomes, although less than ideal in many respects, may serve as a useful guide to changes in the economic position of the poor. The remainder of this chapter suggests ways to take income-distribution considerations into account, within the limits of existing data.

Alternative Approaches to **the** Study of **the** Size Distribution of Income

Income distribution is not the same thing as income equality or inequality. "*By personal distribution* we mean division of income (or wealth) by size,

or more precisely, by size brackets of the income or wealth of economic units" (Bronfenbrenner 1971, p. 27; emphasis in the original). Bronfenbrenner carefully distinguishes between the personal distribution of income and statistics such as the coefficient of variation that "*measure* the degree of *inequality* of a personal income distribution" (p. 43; emphasis added).

The distinction between income distribution and income equality (or inequality) is an important one. Contrast the way we usually think about income distribution with the way we are accustomed to think about the distribution of other economic or social data, such as the distribution of education.

When we consider education, our concern is with how many people have attained how high a level. If a larger fraction of a population achieves literacy, for example, we are inclined to regard that country's education system as having done "better." In making such a judgment, we usually do not think to ask whether more people have also completed university; nor do we compute a statistical measure of inequality of educational attainments, such as the variance or a Gini coefficient. Rather, our strategy is to pinpoint a target group whose upgrading we care most about and then to measure the rate of absolute improvement within that target group.

In studies of income distribution, the approach is ordinarily quite different. Most studies ask: "Did income distribution worsen?" Typically, that question is answered by examining either (1) how the income shares of particular deciles (or other groupings) changed; (2) how the Lorenz curve shifted; or (3) whether measures such as Gini coefficients, variance of incomes or their logarithms, and so on, exhibit greater or lesser inequality. All these are relative-inequality measures. In effect, then, by beginning with relative-inequality measures rather than with absolute levels, the approach to studies of the distribution of income reverses the approach to studies of the distribution of other economic and social goods.

Relative Inequality Approach

Most studies of income distribution in LDCs measure *relative* income inequality, conveniently illustrated by a Lorenz curve in figure 2-1. The Lorenz curve depicts the income share of any cumulative percentage of the population, ordered from lowest income to highest. All relative-inequality measures in current use are based on the Lorenz curve. The Gini coefficient, being most directly related, is the ratio of the area between the Lorenz curve and the 45° line (area A in figure 2-1) to the total area (A + B). The Gini coefficient varies between zero and one. The higher the coefficient, the greater the degrees of relative inequality. The fractile measures in common use, such as the income share of the poorest 40 percent or the richest 10 percent, can be read directly from the Lorenz curve. A class of relative-inequality

1.0

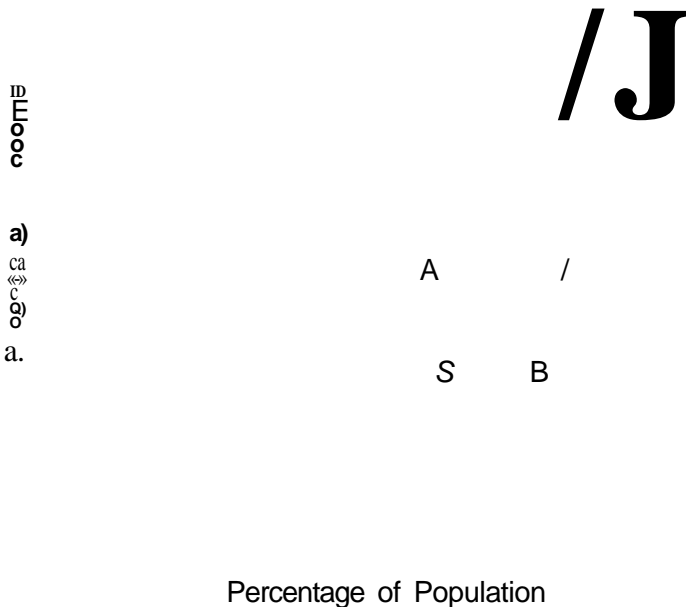


Figure 2-1. Lorenz Diagram

measures may be calculated from the data contained in Lorenz curves. These include many familiar indexes such as the variance (or standard deviation) of income or its logarithm, the coefficient of variation, the Kuznets ratio, the Atkinson index, the Theil index, and many others (Sen 1973).

In using one or more of these inequality measures, the judgment is typically made that *social welfare* (W) depends positively on the *level* of national income (Y) and negatively on the *inequality* in the distribution of that income (I). For example, taking the share of income of the poorest 40 percent of the population (S) as an index of equality and the Gini coefficient (G) as an index of inequality, these studies would hold that W is positively related to Y and S and negatively related to G . The terminology of these studies is indicative—falling S or rising G are given the nonneutral term "worsening of the income distribution," and rising levels of measured inequality are generally considered a bad thing.

A numerical example shows how these judgments are brought to bear in practice.

Example 1

<i>Country</i>	<i>Rate of Growth (%)</i>	<i>Share of Lowest 40 Percent:</i>		<i>Gini Coefficient:</i>	
		<i>Level</i>	<i>Percentage Change</i>	<i>Level</i>	<i>Percentage Change</i>
Both countries initially		0.363		0.082	
Country A later	9	0.333	- 8	0.133	+ 62
Country B later	18	0.307	- 15	0.162	+ 97

Country B grew twice as fast as country A. However, its income distribution, as measured by the Gini coefficient and income share of the lowest 40 percent, seems to be "worse" than that found in country A; that is, it would appear that the rich benefited at the expense of the poor, whose relative income share deteriorated. A development economist might question whether the higher rate of growth in country B was "worth it" in terms of income distribution, and a well-meaning development planner seeking to give very high weight to alleviation of inequality might go so far as to choose country A's policies over those of country B.

Absolute-Poverty Approach

An alternative approach directly examines a country's progress in alleviating poverty among the very poorest. Absolute-income studies of LDCs are the exception rather than the rule. Economists at the Institute of Development Studies, University of Sussex, have been taking an absolute-income approach for some time (International Labour Office 1970). More recently, the World Bank has begun to shift its focus as well (Ahluwalia 1974). These studies are noteworthy precisely because they do differ from the usual approach.

We must first define poverty: an individual is poor if his or her income falls below a specified dollar amount, with analogous figures for families of different sizes. The U.S. Agency for International Development (AID), for example, uses the figure U.S. \$150 per capita (1969 dollars) in LDCs; in the United States, the official poverty line in 1976 was \$5,500 for a nonfarm family of four. The poverty lines used in different countries and the ways they are determined are discussed in subsequent sections. Let us denote this

poverty line, which we will hold constant in real terms, by P^* . "The poor" are those whose incomes are less than P^* .

Most observers would share the following judgments about the extent of poverty (P):

1. P is positively related to the number of income recipients with incomes below the poverty line P^* .
2. The larger the average income of those below the poverty line, the lower is P .
3. If other things are unchanged, the more unequal the distribution of income among the poor, the more severe is P .

In most studies, measures entering into these three judgments are computed separately. However, Sen (1976) combines these measures and argues elegantly for the use of a composite index.

Absolute-poverty measures like those just presented have been used in research in the United States for many years; see, for example, Bowman (1973) or Perlman (1976). The main advantage of absolute-poverty indexes is that they provide *direct* measures of changes in the numbers of the poor and the extent of poverty among them. Note, in contrast, that although poverty indicators can be computed from Lorenz curves or Lorenz-curve-based inequality measures, this information is obtained only indirectly and often with considerable computational difficulty.

To see how the absolute-poverty approach is applied, let us consider now another numerical example for two countries in an early and a later stage of their economic development. Assume the following hypothetical figures, where the poverty line is somewhere between \$1 and \$2:

Example 2

Percentage of Labor Force in:

Country	High Wage Jobs	Low Wage Jobs	Rate of Growth of
	(Real Wage = 2) (%)	(Real Wage = 1) (*)	Modern Sector ("Modern Sector Labor Absorption Rate") (Vo)
Both countries initially	10	90	
Country C later	20	80	100
Country D later	30	70	200

The poor in both countries received the benefits of growth, but in country D twice as many of the poor benefited. Other things being equal, development economists would almost certainly rate country D as superior, and development planners would seek to find out what had brought about that country's favorable experience and to adopt those policies in their own countries. In this second example the preference is clear-cut, while in the previous example the issue was open to doubt.

Relative-Poverty Approach

The relative-inequality and absolute-poverty approaches are the two main ways in which distributional aspects of economic development have been considered. In addition, there is now a newer approach being promulgated by researchers at the World Bank and elsewhere, known as the relative-poverty measure (Chiswick 1976). This figure is the absolute income (in constant dollars) received by the poorest 40 percent of the population. The choice of poorest 40 percent is purely arbitrary. What matters in this approach is the constancy of population share along with income variability among members of that group.

Consider now a third example:

Example 3

<i>Country</i>	<i>Absolute Income of Poorest 40 Percent of Population</i>
Both countries initially	\$40
Country E later	40
Country F later	40

Using the relative-poverty measure, it appears that there was *no* improvement in absolute income of the poorest 40 percent in either case. One might ask: Why grow if the poor do not share in the benefits of growth? In this third example, E and F both seem to have failed to alleviate poverty.

Comparison of the Three Approaches

In point of fact, countries A, C, and E are the same country, as are countries B, D, and F! Real-world economic-development histories and policy projections are often presented in these different ways. Yet, as these examples make clear, how income distribution is studied—whether in terms of

relative income inequality (as in example 1), absolute incomes and poverty (example 2), or relative poverty (example 3)—may dramatically influence our perceptions of the outcome.

Specifically, we have encountered the following differences in our examples. According to the absolute-poverty criterion, B-D-F clearly dominates A-C-E on both growth and distribution grounds. Using the relative-inequality criterion, it is difficult to judge; although B-D-F grew faster than A-C-E, its income distribution seems to have worsened. Finally, by the relative-poverty criterion both appear unsatisfactory; neither country seems to have made progress in alleviating poverty, although in fact poverty was being alleviated in both, at different rates.

The relative-poverty measure fails to record an income-distribution change. These countries were alleviating poverty, yet the relative-poverty measure is totally insensitive to the change. Relative-poverty measures are unsuited for gauging the distributional consequences of the growth illustrated in this two-country comparison. Difficulties with the relative-poverty measure arise in cross-sectional data, where we look at those who are the poorest 40 percent *ex post* at different times, disregarding the movement of specific individuals into and out of the poorest 40 percent. Longitudinal data would permit tracing the progress of individuals who rose out of the poorest 40 percent. Unfortunately in the real world, we do not have longitudinal data for LDCs. An illustration of movement up and down the U.S. income scale appears in chapter 1.

The relative-inequality and absolute-poverty approaches yield somewhat different answers as to whether a pattern of growth is desirable. Whether poverty is relative or absolute is a value judgment. Statistical patterns that in some respects are artifacts also affect comparison of these approaches.

What is it about the process of economic development that produces a discrepancy between the different approaches?

Do we give greater weight to the alleviation of absolute poverty or to the narrowing of relative income inequality?

The answer to the first question is that the discrepancy is produced by the unevenness of economic development itself. An economy grows by enlarging the size of its modern sector. Incomes and wages within the modern and traditional sectors remain far apart, and neither rises. This type of growth affects only some of the poor—those who shift from the traditional to the modern sector. Those whose situations are not improved by this type of growth remain as poor as before, receiving the same income, which is now, however, a smaller part of a larger whole. The absolute incomes of

the poorest 40 percent may be unchanged. The Lorenz curve shifts downward at its lower end. Lorenz-curve-based measures of relative income inequality that are sensitive to the lower end of the income distribution register a "worsening" of the income distribution.

The pattern of growth illustrated is widely regarded as an essential ingredient of development. In their famous *Development of the Labor Surplus Economy* (1964), Fei and Ranis wrote: "... the heart of the development problem may be said to lie in the gradual shifting of the center of gravity of the economy from the agricultural to the industrial sector . . . gauged in terms of the reallocation of the population between the two sectors in order to promote a gradual expansion of industrial employment and output (1964, p. 7)." This characterization is echoed by Kuznets (1966). Empirical studies, such as that of Turnham (1971), document the absorption of an increasing share of the population into the modern sector as growth continues. In a case study of Indian economic development in the 1950s, Swamy (1967) found that 85 percent of the change in the size distribution of income was due to intersectoral shifts (namely, growth in importance of the urban sector and growing per-capita-income differential between the urban and rural sectors) and only 15 percent to changing inequality within the two sectors. Modern-sector enlargement comprises a large and perhaps predominant component of the growth of currently developing countries.

The choice between absolute- and relative-income measures depends on basic ethical considerations. The plight of the poor in LDCs is objective; they do not command sufficient resources to feed and clothe themselves and avoid disease. Poverty is an absolute condition, requiring analysis in absolute terms. The predominant emphasis must be given to data on changes in the number of poor people, the average extent of their poverty, and the degree of inequality among them.

Others have different concerns and make different judgments, giving great weight to the subjective feelings of the poor, who may feel relatively worse off if the economic positions of others are improving while theirs are not. Observers who feel strongly about such relative-income considerations are justified in using relative-inequality measures.

What may not be justified—and there are many examples of this in the development literature—is the coupling of a concern about the absolute economic misery of the poor with a reliance on calculations of changes in relative inequality over time. This approach may be mistaken, misleading, and logically inconsistent. For just as in the numerical example above, the assignment of heavy weight to changes in the usual indexes of relative income inequality and the interpretation of these increases as offsetting the economic well-being brought about by growth, may lead to the overlooking of important tendencies toward the alleviation of absolute poverty.

Many observers would contend that the goal of economic development is to alleviate absolute poverty. If that is the goal, it seems logical to measure progress toward that goal directly, using absolute-poverty criteria, rather than indirectly, with relative-inequality or relative-poverty indexes. The numerical example in this section showed how differences among the various approaches may arise. If students of economic development or policy makers use relative-inequality measures when they really care about absolute poverty, they may be misled.

Income Inequality and Level of Development

The initial work on size distribution of income across countries is that of Nobel Prize-winning economist Simon Kuznets (1955). Comparing India, Ceylon, Puerto Rico, the United Kingdom, and the United States, he observed greater inequality in the developing countries. The pattern of greater relative income inequality in the LDCs than in the developed countries was confirmed in a subsequent paper by Kuznets (1963) for eighteen countries.

Based on that evidence, Kuznets formulated the "inverted-U hypothesis," which states that relative income inequality rises during the early stages of development, reaches a peak, and then declines in the later stages. Kuznets assumed that LDCs had greater equality in their earliest stages of development, because all were equally poor. No data were available to test this speculation. Even today, suitable data do not exist; see Kravis (1973, p. 71).

In the late 1960s and early 1970s, Adelman and Morris gathered new data for forty-three developing countries. In their 1973 book, they presented considerable evidence on the correlates of relative income inequality. By means of analysis of variance, they found six factors to be important in explaining variations in relative income inequality. Included among these was the level of economic development.

A short while later, Paukert (1973) tried to refine the Adelman and Morris estimates. He discarded information that he considered particularly unreliable, added some new countries for which good data had recently become available, and presented summary information on the size distribution of income in fifty-six countries. For each of several alternative relative-inequality measures, Paukert found that inequality begins at a comparatively low level, reaches a peak in the \$301-500 per-capita-income countries, and then diminishes at higher incomes. Thus, the inverted-U pattern is reconfirmed.

From this evidence, many development economists arrived at the view that "income distribution must get worse before it gets better." There was considerable pessimism over the supposed trade-off between growth and income equality. This interference is based on cross-section data, not on

historical trends. In their introduction, Adelman and Morris used such words as "preliminary," "exploratory," and "tentative" to describe their caution in interpreting results. Few countries offer direct evidence on income-distribution change over time.

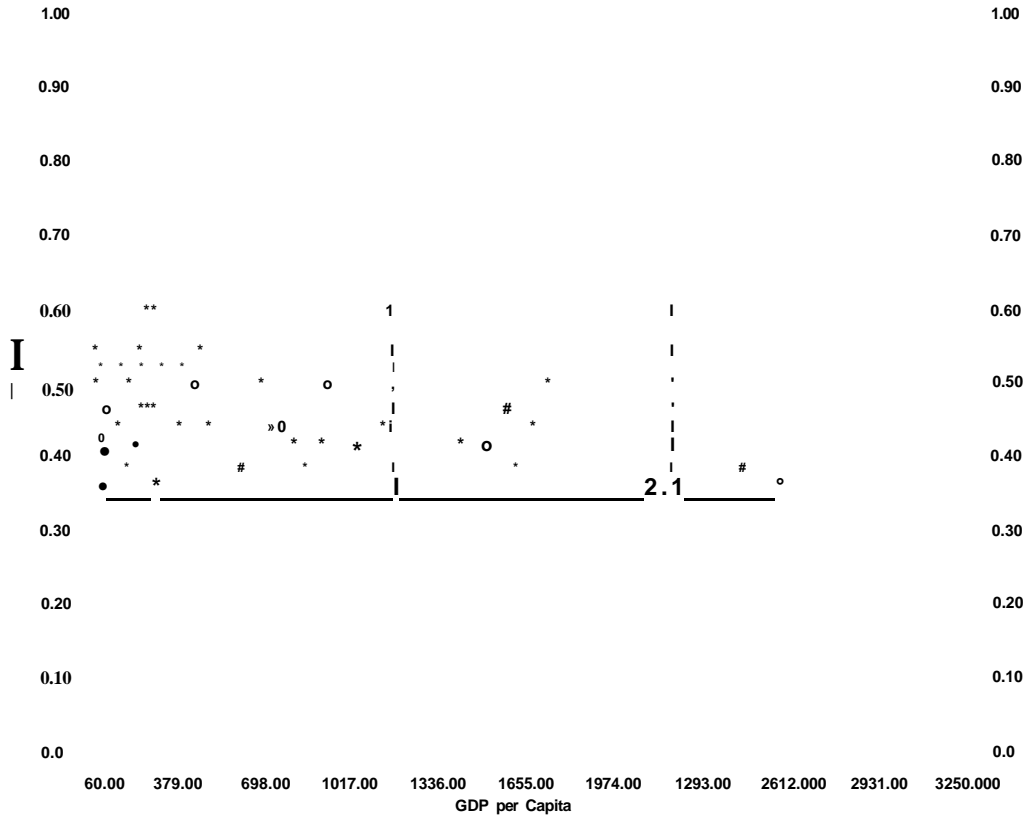
A second problem with the inverted-U is that we are dealing with averages among *groups* of countries and not, for the most part, with the information on individual countries themselves. Figure 2-2 presents Paukert's data in graphic form (Paukert 1973, table 6). Individual data are indicated by asterisks, and averages for each income class of countries by heavy circles. There appears to be much more variation in relative inequality *within* country groups than *between* them. Before regarding the inverted-U pattern as inevitable, therefore, even in the cross section, we need to know how well the inverted U fits the data.

By means of multiple-regression analysis on individual-country data, we may determine (1) whether an inverted U is the appropriate characterization of the inequality-income relationship, and (2) whether any particular pattern of inequality change over time is inevitable. On both accounts, the evidence suggests that income distribution need *not* get worse before it gets better.

In the individual-country data collected by Paukert, we can define six dummy variables denoting income class, the first for GDP per capita between \$101 and \$200, the second between \$210 and \$300, and so on. (The reason for defining only six dummy variables when there are seven categories is to avoid perfect multicollinearity in the regression equation reported below.) For each, we assign the value 1 if the country's GDP places it in that category, 0 otherwise. If we then run a multiple regression with the Gini coefficient of inequality as the dependent variable and these six dummies as independent variables, the coefficients on the dummy variables may be interpreted as the effect on the Gini coefficient of being in that income group rather than in the \$0-100 per-capita-income group. If the inverted-U hypothesis is correct, these coefficients will be positive and increasing up to some point, declining thereafter.

The results of the regression based on the figures for fifty-six countries were:

$$\begin{aligned} \text{GINI} = & 0.418 + 0.507_{\$101-200} + 0.0807_{\$201-300} \\ & (0.042) \quad (0.039) \\ & + 0.076y_{\$301-500} + 0.019y_{\$501-1000} - 0.019y_{\$1000-2000} \\ & (0.040) \quad (0.045) \quad (0.039) \\ & - 0.052Y_{\$2001} \\ & (0.057) \\ R^2 = & 0.22 \end{aligned}$$



Source: Computed from data in Felix Paukert, "Income Distribution at Different Levels of Development: A Survey of Evidence," *International Labor Review*, August-September 1973.

Figure 2-2. Gini Coefficient and Gross Domestic Product per Capita, Fifty-six Countries

where Y denotes GDP per capita (standard errors in parentheses). The pattern of regression coefficients is consistent with the pattern predicted by the inverted-U hypothesis, that is, rising at first and then falling. However, the initial stage of rising inequality is not statistically significant at any of the conventional levels. (Compare, say, the first three regression coefficients with their standard errors.)

Worse still for Kuznets, Paukert, and other adherents of the inverted-U hypothesis are the results of a simple parabolic regression. The inverted-U hypothesis may be tested by regressing the Gini coefficient on GDP per capita and GDP per capita squared. If the relationship is in fact of the inverted-U form, GDP per capita would have a positive coefficient, and GDP per capita squared a negative coefficient. The regression results were:

$$\text{GINI} = 0.473 - 0.00003\text{GDP} - 0.00000\text{GDP}^2 \quad R^2 = 0.11$$

(0.56) (0.34)

(t statistics in parentheses).

The negative coefficient on GDP in Paukert's data is contrary to the initial-worsening hypothesis.

This result is not suited to the choice of inequality measure or data set. Cline (1975) reports the results of a similar regression using Adelman and Morris's data rather than Paukert's, and using as the measure of inequality (7) the ratio of the income share of the top quintile to the share of the bottom quintile. His results, with t statistics reported in parentheses, were:

$$I = 7.23 + 0.0258\text{GNP} - 0.000014\text{GNP}^2 \quad R^2 = 0.12$$

(0.7) (2.8)

In any case, the initial-worsening hypothesis receives at best only limited support in the data.

Concerning the inevitability issue (the view that "income distribution must get worse before it gets better"), we should note how little of the variance in relative inequality is explained by income level. In the dummy-variable regression, income level can explain only 22 percent of the inter-country variation in inequality as measured by the Gini coefficient, and in the parabolic regression, only 11 percent. The inverted U is avoidable. Income distribution may be determined as much by development style and public policies as by the level of development. Appropriate public policy can be designed to avoid a deterioration in the relative distribution of income and to effect an improvement in the economic status of the poor.

Causes of Relative Inequality

How do a country's economic characteristics determine its income distribution? Three particularly noteworthy studies address this question.

Adelman and Morris (1973), base their investigation on cross-sectional observations for forty-three LDCs. To measure income inequality, they used three alternative indicators: the income share of the lowest 60 percent, the income share of the middle quintile, and the income share of the richest 5 percent. They report six variables as important in determining the distribution of income in a country:

1. rate of improvement in human resources;
2. direct government economic activity;
3. socioeconomic dualism;
4. potential for economic development;
5. per-capita GNP;
6. strength of labor movement.

Interestingly, no significant relationship is found between relative income inequality and short-term economic-growth rates, short-term improvements in tax and financial institutions, or short-term increases in agricultural or industrial productivity. The interested reader is referred to their book for the proxy variables used and their specific definitions.

The Adelman-Morris exercise has been subjected to a great deal of criticism, including doubts about the quality of the underlying data, discomfort over the lack of a well-defined theoretical framework, and skepticism about the appropriateness of the statistical methods employed. These criticisms encourage hesitancy in accepting Adelman and Morris's conclusions on the importance of the six factors listed above and the unimportance of others not in that list.

A second study of causes of relative inequality, somewhat earlier but less well-known than that of Adelman and Morris, is that of Chiswick (1971). Using an elementary human-capital model, Chiswick deduced that variability in earned income should be functionally related (positively) to four factors:

1. the inequality of investment in human capital;
2. the average level of investment in human capital;
3. the average level of the rate of return to human-capital investment;
4. the inequality in the rate of return to human-capital investment.

He then subjected these hypotheses to empirical testing in a cross section of nine countries, four of which are LDCs.

Unfortunately, there are two problems: (1) there is a scarcity of data to test the model, and (2) what data there are (from Lydall 1968) prove inconclusive. In Chiswick's regressions, the variable measuring inequality of educational attainments is statistically significantly related (with the correct sign) to earnings inequality in two out of three cases. The variables for average per-capita GNP and rate of growth of GNP prove, with one exception, to be insignificant. Thus the hypotheses derived from the human-capital model of earnings inequality receive only limited empirical support. Whether this weakness is due to limitations of the data or of Chiswick's specific formulation is an open question awaiting additional examination.

Finally, recent work at the World Bank by Ahluwalia (1976) draws on data from sixty-two countries. For alternative indicators of relative income inequality, he used the income shares of the top 20 percent, middle 40 percent, lowest 40 percent, and lowest 60 percent. He found a statistically significant relationship between income shares and per-capita GNP consistent with the inverted-U pattern. However, there does not appear to be an independent short-term relationship between the level of inequality and the rate of growth of GNP.

The explanatory variables associated with income inequality are: (1) the rate of expansion of education, (2) the rate of decline of demographic pressures, and (3) changes in the structure of production in favor of the modern sector. More specifically, improvement in literacy, reduced rate of growth of population, reduced share of agriculture in national product, and shifting of population to the urban sector are found to reduce relative income inequality.

The Ahluwalia study is carefully done and offers a reasonable set of stylized facts about the patterns of relative income inequality and their correlates.

The usual concomitants of economic development (particularly improved education, reduction in the importance of agriculture, and growth of the urban sector) significantly lower relative income inequality. The evidence is mixed on the level of economic development: Both Ahluwalia and Adelman and Morris find a significant relationship between relative inequality and per-capita GNP, while Chiswick finds these effects insignificant. None of these studies finds a statistically significant relationship between the level of inequality and the rate of economic growth. They also fail to establish the importance of tax systems and agricultural-productivity improvements.

These cross-section analyses follow a long tradition, pioneered at Harvard University in the last decade, of deriving conclusions about the process of economic development by looking at countries at different stages of development (Chenery 1960; Chenery and Taylor 1968; Chenery and Syrquin 1975). Such analyses are based on the assumption that currently

developing countries will follow much the same pattern in their development experiences as is found in the cross section. Many, myself included, reject this assumption. It would be better to investigate the direct evidence on changes in income distribution within a given country at two or more points in time in that country's development history.

*Evidence on Historical Trends
Within a Country over Time*

The evidence on historical trends in income distribution within a country over time is scattered and has not yet been synthesized in a multicountry study. Much of the research is as yet unpublished, and many more studies are now in progress. In this section we will survey the major multicountry studies on this question.

The pathbreaking contribution in the field is that of Kuznets, who in his 1963 paper reviewed the available evidence for a number of now-developed countries. For two countries (Prussia and Saxony in the late 1800s), the income share of those at the top of the income distribution rose or remained the same. In the United Kingdom, Germany, the Netherlands, Denmark, Norway, Sweden, and the United States, the data show a steady decline in relative inequality, as measured by the income shares of the top 5 percent and the lowest 60 percent.

Interestingly, this is not the usual lesson drawn from Kuznets's research. He wrote, "It seems plausible to *assume* that in the process of growth, the earlier periods are characterized by a balance of counteracting forces that may have widened the inequality in the size distribution of income for a while . . ." (1963, p. 67; emphasis added). One looks in vain for statistical evidence documenting the plausible assumption in the actual historical experiences of any of the nine countries named above. Nevertheless, these two papers are among the best known and most widely cited as supporting the inverted—U hypothesis.

Kuznets's writing stimulated development economists to study the facts in countries that were still less developed. The first multicountry historical study of the patterns of income-distribution change in LDCs was the paper by Weisskoff (1970) for Puerto Rico, Argentina, and Mexico. Weisskoff's paper includes a brief discussion of the traditional measures of relative income inequality, including the Gini coefficient, the Kuznets ratio, the coefficient of variation, variance of the logarithms of income, and standard ordinal shares. "In each of the three developing countries," he writes, "we noted that equality of income declined as the level of income rose over time" (1970, p. 317).

In contrast to Weisskoff's interpretation of his own numbers, the numerical results are in fact quite mixed. In each country at least one of the

relative-inequality measures shows an increase and at least one other measure shows a decline. Thus the effects of economic growth on relative income inequality were ambiguous in these three cases.

The reported findings of Kuznets and Weisskoff as well as growing bodies of evidence from cross-sectional studies led many observers in the early 1970s to the view that there may be a conflict between the rate of growth of income and equality in the distribution of that income. If so, this would be a harsh dilemma. Further investigation was in order, and it was soon forthcoming.

In an influential paper in an equally influential volume, Ahluwalia (1974) presented evidence relating the growth of income shares of the lower 40 percent to the overall rate of growth of the economies of eighteen countries, all but a few of which are LDCs (see figure 2-3).

The scatter suggests considerable diversity of country experience in terms of changes in relative equality. Several countries show a deterioration in relative equality but there are others showing improvement . . . *there is no strong pattern relating changes in the distribution of income to the rate of growth of GNP.* In both high-growth and low-growth countries there are some which have experienced improvements and others that have experienced deteriorations in relative equality.(emphasis added)¹

In his work, Ahluwalia did not attempt to relate the observed changes to countries' economic-development strategies, such as import substitution or export promotion. Evidence on this question would be welcome.

The data presented by Kuznets, Weisskoff, and Ahluwalia shows that the supposed "harsh dilemma" of growth versus equality might be avoidable.

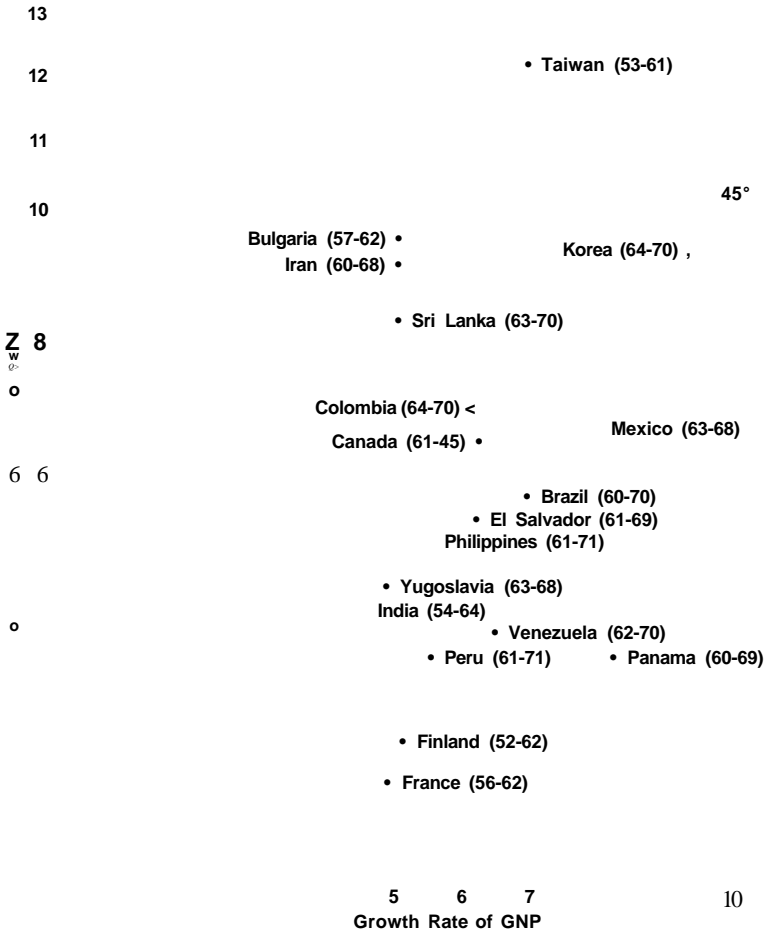
Relative-inequality studies suggest the following stylized facts:

In a cross section of countries, the bulk of the evidence indicates an inverted-U pattern in the relationship of relative income inequality with the level of economic development.

However, countries' income levels explain only a small part of variability in measured inequality. Other characteristics of the economy also play a role.

Among the variables associated with cross-sectional patterns of relative inequality are improved education, growth of the urban sector, and the decline of agriculture. The evidence on the level of national income is mixed. Tax systems and agricultural productivity have not been shown to be important determinants of the cross-sectional pattern.

In the cross section, no systematic relationship is found between the rate of growth of the economy and relative inequality.



Source: M.S. Ahluwalia, "Income Inequality: Some Dimensions of the Problem," *Redistribution with Growth*, ed. Hollis Chenery et al. (London: Oxford University Press, 1974), p. 14.

Figure 2-3. Growth and the Lowest 40 Percent

Similarly, changes in the relative income share of the poorest 40 percent of the population in the historical experience of a given country exhibit no marked association with the economy's growth rate.

It may be that certain economic-development strategies, such as export promotion versus import substitution, tend to be related to changes in the relative income distribution; however, no systematic evidence has been gathered on this point.

**Absolute Poverty versus Relative Inequality:
Two Case Studies**

Do figures on relative income inequality provide suitable poverty indicators? May we instead approach the question of changing income distribution from an absolute-poverty perspective? The relevant questions must address the determinants of incomes and of poverty and how these determinants have changed over time.

The relative-inequality and absolute-poverty approaches may differ in assessing the distributional consequences of growth; whether or not they do is an empirical question. The available data permit intensive examination of two countries, Brazil and India.

Brazil

One of the most interesting and controversial cases of economic development is that of Brazil. Over the decade of the 1960s, the real rate of economic growth was 79 percent. After allowing for a high population-growth rate, real income per capita grew 32 percent over the decade, a substantial achievement by LDC standards. In the late 1960s and early 1970s, Brazil experienced rates of growth approaching 10 percent per year. On this basis, the Brazilian case was widely heralded as an "economic miracle."

Then a cloud appeared on the horizon. In an exceptionally influential paper, Fishlow (1972) examined the distributional question of who received the benefits of this growth. Using the Gini coefficient of inequality and the income share received by the richest 3 percent of the population, Fishlow observed a worsening of the relative income distribution during the 1960s, despite the rapid economic growth of the latter years. A similar qualitative conclusion was reached subsequently by Adelman and Morris (1973, p. 1) based on the income share of the poorest 40 percent. Some of the data underlying these conclusions are presented in table 2-1.

The finding that income inequality in Brazil had increased gave pause to many. As a result, there is now widespread disagreement about the desirability of taking Brazilian economic and social policies as a model for other developing countries to follow. It is probably fair to say that, because of Fishlow's paper, most observers no longer regard the Brazilian experience as "miraculous."

Some economists, although not Fishlow himself, inferred from this evidence that the growth that had taken place had been at the expense of the poor (Foxley 1975). A softer inference is that the poor did not share in the benefits of Brazilian growth. Both inferences are incorrect. They arise

Table 2-1
Data on Income Distribution in Brazil

	1960	1970
Gini coefficient of inequality, total economically active population ^a	0.59	0.63
Income share of richest 3.2 percent ³	27%	33%
Income share of poorest 40 percent ^b	10%	8%

^aSource: Albert Fishlow, "Brazilian Size Distribution of Income," *American Economic Review* 62 (1972):391-402.

^bSource: I. Adelman and C.T. Morris, *Economic Growth and Social Equity in Developing Countries* (Stanford, Calif.: Stanford University Press, 1973).

from the use of relative-inequality rather than absolute-poverty measures (Fields 1977).

Absolute-poverty comparisons require data on changes in the number of persons with incomes below a constant real-poverty line, in this case the minimum wage in the poorest region of the country, the northeast. The cumulative percentage of population was lower in 1970 than in 1960 for every income bracket. The economic growth that took place in Brazil over the decades of the 1960s reached persons at all income levels, not just those at the top.

The percentage of the economically active population with incomes below the Brazilian poverty level declined during the decade; those who remained poor were not as poor as before; and the rate of growth of income among the poor was at least as great as the rate of growth among the non-poor.

The entire income distribution shifted in real terms, benefiting every income class. There was a small decline, from 37 to 35.5 percent, in the fraction of the economically active population below the poverty line. Those who remained "poor" experienced a marked percentage increase in real income (from one-third to as much as two-thirds higher).

The percentage increase in income for those below the poverty line was greater than the increase for those not in poverty, and may well have been twice as high or more.

The income gap between poor and nonpoor persons narrowed in terms of ratios, although the absolute gap widened. The bulk of the income growth over the decade accrued to persons above the poverty line. A similar pattern is observed for the United States, an allegedly more egalitarian society. The poverty gap in Brazil, the sum of the differences between each

poor person's income and the poverty line, was reduced by 41 percent between 1960 and 1970. The United States reduced its poverty gap by exactly the same percentage over the same decade.

The poor in Brazil *did* benefit from the economic growth that took place during the 1960s. This conclusion can be stated with no intention of condoning the persistence of the severe poverty that remains, the apparent lack of a strong commitment by the Brazilian authorities to alleviate the current plight of the poor in this generation, or some of the more authoritarian measures reputed to have been used to ensure social stability. Rising Gini coefficients and income shares of the very rich are consistent with nontrivial improvements in the economic position of the poor. Relative-inequality comparisons led many to overlook important tendencies toward the alleviation of absolute poverty.

India

In India, on the other hand, the situation is very different. India is poor and growing slowly, with per-capita income under U.S. \$100. During the 1960s, per-capita private-consumer expenditure grew by less than 0.5 percent per annum (Dandekar and Rath 1971, p. 40). India offers abundant data on the distribution of income and consumption dating back to the 1950s. Given the richness of the data in so poor a country with so large a research establishment, it is not surprising that we find a multitude of income-distribution studies. The remarkable feature about the relative-inequality data is that no clear pattern of change emerges.

Overall, as measured by the Gini coefficient, relative income inequality shows no particular trend. The Gini coefficient within the urban sector may have risen somewhat, suggesting greater inequality, but the evidence is mixed. The Gini coefficient within the rural sector seems to have declined, suggesting lesser inequality; but as with the urban Gini coefficient, no strong tendency is found. Possibly the income share of the bottom 20 percent rose while the share of the top 20 percent fell nationwide, together suggesting diminished inequality; but both changes are small.

Given the inconclusiveness of the individual findings, the contradictory indications as to whether inequality increased or decreased, and the small magnitudes of the changes as compared with probable errors in sampling and measurement, the conclusion seems warranted that the pattern of relative inequality in India remained essentially unchanged.

A leading Indian economist, P.K. Bardhan, takes issue with relative-inequality measurements of income distribution. "For a desperately poor country like India," he writes, "there are many who believe that no measure of inequality which is in terms of relative distribution and is in-

dependent of some absolute poverty standard can be entirely satisfactory" (1974, p. 119). Accordingly, he calculated estimates of the percentage of the population below a constant absolute-poverty line:

<i>Year</i>	<i>Rural</i>	<i>Urban</i>
1960-1961	38	32
1964-1965	45	37
1968-1969	54	41

Absolute poverty worsened greatly in India between 1960-1961 and 1968-1969, even though relative inequality did not.

As in the case of Brazil, relative-inequality measures suggest one set of conclusions with respect to changing income distribution while absolute-poverty comparisons suggest another. The discrepancy is exactly reversed: more absolute poverty despite apparently constant relative inequality in India, alleviation of absolute poverty despite rising relative inequality in Brazil.

The choice of a relative or absolute approach does make an important qualitative difference. Data from Brazil suggest a worsening of the income distribution: The Gini coefficient was noticeably higher in 1970 than in 1960, the share of income received by the very richest rose, and the share received by the very poorest fell. Focusing on absolute rather than relative incomes, we find that the poor in Brazil shared in economic development, albeit to a limited extent. Incomes of those below the Brazilian poverty line increased by possibly double the percentage of those above the line.

In India, relative income inequality did not change noticeably. Some inferred that India had at least held the line on income distribution. From an absolute-poverty perspective, however, India did not hold the line at all: Absolute poverty increased considerably.

Relative-income measures disguise changes in absolute poverty among the poor in developing countries. They may lead to inaccurate assessments of commitment and progress in reducing poverty. To measure alleviation of absolute poverty, it is more appropriate to use absolute-poverty measures: the number of individuals or families with incomes below a constant real-poverty line, or the average gap between the incomes of the poor and the poverty line.

Implementing the Absolute-Poverty Approach

A country's progress in alleviating poverty is best gauged by a measure designed especially for that purpose. In this section we describe what is

needed; demonstrate how the approach has been applied in Brazil; outline the present availability of data in LDCs; and, finally, explore ways to close the gap between data needs and data availability.

The absolute-poverty approach requires definition of a time-invariant real-income figure called the poverty line. Next comes information on the number of persons (or families) with incomes below that line and the average income among them. It may also be useful to know the degree of income inequality among the poor. To measure poverty alleviation in a particular country's economic development requires comparable and detailed figures on the size distribution of income for at least two time periods, and preferably more.

Conceptually, the absolute-poverty line should be defined in such a way that we would not hesitate to regard an individual or family with income below that figure as poor (Webb 1976). A straightforward way of doing this is to establish a dollar-income figure, chosen as scientifically as possible. In the United States, for example, the poverty line was derived by ascertaining the amount of money needed to purchase a nutritionally adequate diet consistent with the food preferences of the poorest groups in the population, and then multiplying this figure by a factor of three, since the poor spend about one-third of their incomes on food (Orshansky 1965). As one LDC example, in Brazil the poverty line is taken as the minimum wage in the northeast (Brazil's poorest region), adjusted in other parts of the country for cost-of-living differences (Fishlow 1972). Another LDC example, based on consumption rather than income, is found in Ferber and Musgrove (1976). In both cases, the specific income figure depends on family size.

In India, the Planning Commission used a figure of 20 rupees (Rs.20) per month (in 1960-1961 prices) per capita as the nutritionally minimal standard. This figure was modified by other researchers: Dandekar and Rath (1971) took Rs.15 per capita per month for rural poverty and Rs.22.5 for urban, while Bardhan (1970,1974) used Rs.15 and Rs.18 respectively (1974, pp. 119-123). The World Bank has estimated the population below U.S. \$50 per capita, and AID has suggested an international per-capita figure of \$150 per capita (see table 1-1).

Provided that the poverty line chosen bears a reasonable relationship to living standards in the country in question, there is little advantage in worrying about what the exact dollar figure should be. Absolute-income standards such as \$150 per capita or the minimum wage in the country are reasonable benchmarks.

What is important, indeed crucial, about the absolute-poverty line in a dynamic-development context is that it be held constant in real terms, that is, after adjusting for inflation. No other adjustment (for example, an adjustment for productivity growth) is appropriate (Bacha 1976).

In empirical research, as a check on the arbitrariness of any given poverty line, one might experiment with simple multiples of that line, as Bardhan did in India, to test whether similar changes in the incidence and severity of poverty are found. In this way, disputes over the correctness of any specific poverty-line definition are minimized; and attention is directed where it should be, namely, at the constancy of the line itself and the distribution of the population around it.

Application of the Absolute-Poverty Approach to Brazil

For Brazil, figures on the size distribution of income are available for 1960 and 1970 from a variety of sources. The published figures need to be adjusted for inflation. Taking the poverty line as new Cruzeiros (NCr.) 2,100 in 1960 units, and allowing for an overall inflation factor of 3.53, we need data on the percentage of population below NCr. 7,413 ($\$2,100 \times 3.53$) in 1970 and on the incomes of those persons.

Approximating income distributions is a tricky business when data are missing. A simple linear-interpolation procedure or a log-linear or some other approximation shows that the qualitative conclusions about changes in absolute poverty are robust to *any* assumption that one might make that is consistent with the data (Fields 1976b).

These problems could easily be resolved by recourse to the underlying microeconomic data. All that would be required would be to tabulate the population into income groups after first adjusting for an inflation factor; for example, in the case of Brazil, by dividing all 1970 incomes by 3.53 so as to make them comparable with 1960 incomes, or equivalently, by multiplying all 1960 incomes by this same factor. This is something the Central Statistical Office in Brazil could easily do.

Availability of Data in Less-Developed Countries

Recent years have witnessed extensive gathering of data on the size distribution of income in less-developed countries. The most important compilations include those by:

1. Jain (1975) at the World Bank;
2. Adelman and Morris (1973);
3. Paukert (1973) at the International Labour Office;
4. Altimir (1974), reporting on work under a joint Economic Commission for Latin America-World Bank project;

5. a compendium of six papers—by Choo (1975), Meesook (1975a), Rajaraman (1975), Phillips (1975), Urrutia (1975), and Langoni (1975)—commissioned by the Princeton University-Brookings Institution project on income distribution in less-developed countries;
6. Musgrove (1976b), reporting on work under the auspices of the Program of Joint Studies of Latin American Economic Integration (ECIEL) in conjunction with the Brookings Institution.

These sources are described in appendix 2A.

Income-distribution data for two or more points in time are available for only twenty less-developed countries: Bangladesh, Brazil, Colombia, Costa Rica, El Salvador, Gabon, India, Ivory Coast, Korea, Malaysia, Mexico, Pakistan, Panama, Peru, Philippines, Sri Lanka, Taiwan, Thailand, Tunisia, and Venezuela. Availability of data alone is not sufficient to permit income-distribution comparisons. At a minimum, definitions of income and coverage of the censuses or surveys must be directly comparable. None of the compilations offering income-distribution data for more than one point in time ensure comparability. Even in the best of circumstances, where the data appear reasonably comparable over time, cost-of-living adjustments and interpolations of the income distribution must be made. No LDC publishes the kind of income-distribution data adjusted for inflation that permit application of absolute-poverty measures without further adjustments.

For only a handful of countries can we look back and reconstruct figures on income distribution and poverty for more than two years. The possibility of monitoring the progress made by countries toward alleviating poverty (in the same way that we can monitor annual GNP growth rates, for instance) looks bleak indeed.

Closing the Gap Between Data Needs and Data Availability

Four specific steps can make more data on changes in income distribution and poverty alleviation available:

1. The Jain data should be used for income-distribution and absolute-poverty calculations, both at a point in time and over time in those countries for which the intertemporal data are reasonably comparable.
2. This same process should be followed using the microeconomic data in the original questionnaires or computer tapes and avoiding interpolation.

3. New censuses and surveys should be designed and financed, and ongoing ones should be encouraged to provide data that are comparable with respect to definition, scope, and coverage.
4. As the results of income-distribution and absolute-poverty studies become available, an international agency could usefully process these figures and issue the results in periodic reports.

One finding from this review of the available data and their limitations is the virtual impossibility of regularly monitoring the progress and commitment of one hundred or so LDCs on the income-distribution front. The data do not permit it, nor will they soon do so. There are nationwide income-distribution data for just forty-seven of these countries and data on changes in income distribution for only twenty. It will be many years before information on changes in income distribution and poverty become available for even a majority of these countries. Over the next several years, information will trickle in on progress in improving the economic position of the poor and on the determinants of that progress or lack thereof. In the interim, some other basis must be used to decide where progress is taking place.

Conclusions

This chapter is a response to interest in greater equality of income distribution as a goal of economic development. Greater equality of income distribution may be thought of as demonstrable improvement in the economic position of the poor. How rapidly poverty is being alleviated is very much worth knowing, but there is little information on the subject at present.

There is a very real danger in using any measure as an indicator of a country's commitment to alleviating poverty. These measures cannot tell us what was possible nor how well the country did in relation to how well it might have done. Countries that show little progress in alleviating poverty may find themselves in this sorry state because they have so very far to go and so very little to do it with, rather than because they have not tried.

The state of the art is not far enough advanced to provide guidance on how to take these factors into account in deriving an adequate measure of progress relative to potential. This point applies not only to income distribution; it pertains also to improvements in agricultural productivity and nutrition and to reductions in unemployment and infant mortality as criteria for assessing a given country's commitment to improving the economic position of its poor.

In gauging commitment to the poor as a criterion for receipt of aid, simple screening processes would help avoid those countries in which the aid

funds are clearly being funneled into the hands of the rich or of corrupt government officials. Beyond that, in choosing which countries merit assistance, donors might do well to continue to identify the large groups of poor and to channel resources accordingly. For this purpose, data on income distribution, despite their limitations, are invaluable.