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# Changes in Poverty and Inequality in Developing Countries

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## Abstract

This paper presents new data on poverty, inequality, and growth in those developing countries of the world for which the requisite statistics are available. Economic growth is found generally but not always to reduce poverty. Growth, however, is found to have very little to do with income inequality. Thus the "economic laws" linking the rate of growth and the distribution of benefits receive only very tenuous empirical support here.

## Keywords

poverty, inequality, development, economic growth

## Disciplines

Growth and Development | Income Distribution | International and Comparative Labor Relations | Labor Economics

## Comments

### Required Publisher Statement

© Oxford University Press. Final version published as: Fields, G. S. (1989). Changes in poverty and inequality in developing countries. *World Bank Research Observer*, 4(2), 167-185. doi: 10.1093/wbro/4.2.167

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### Suggested Citation

Fields, G. S. (1989). *Changes in poverty and inequality in developing countries*[Electronic version]. Retrieved [insert date], from Cornell University, ILR School site:

<http://digitalcommons.ilr.cornell.edu/articles/979>

## **CHANGES IN POVERTY AND INEQUALITY IN DEVELOPING COUNTRIES**

*Gary S. Fields*

### **Abstract**

This paper presents new data on poverty, inequality, and growth in those developing countries of the world for which the requisite statistics are available. Economic growth is found generally but not always to reduce poverty. Growth, however, is found to have very little to do with income inequality. Thus the "economic laws" linking the rate of growth and the distribution of benefits receive only very tenuous empirical support here.

For nearly two decades, the World Bank has had an abiding interest in the political economy of income distribution and economic growth. Research on income distribution that has emerged over the years has sought to increase the understanding of donors, policymakers, and academics on the important questions of who benefits from economic development, who is hurt by economic decline, and why.

How has income distribution changed with economic growth in the countries for which information is available? In 1985, the World Bank launched a research project on the political economy of poverty, equity, and growth. Its purpose was to "explore the processes of interactions between growth, equity and poverty alleviation particularly as they are affected by different types of public policies, using a combination of 'analytical history' and 'political economy.' "

This article summarizes data from the political economy project as well as other evidence. The results should be viewed as establishing the stylized facts of poverty, inequality, and growth rather than as tests of formal theories or of rigorous econometric models. In this article, the term "the poor" refers to those whose income falls below a figure established as the poverty line. "Poverty" may be used to indicate the extent to which the poor lag in income. The term "inequality" refers to disparities in income or income growth rate among groups. Some groups may experience greater proportional gains in income than do others. Inequality increases if the income of the rich rises at a higher rate than that of the poor.

In the example of a country that experiences economic growth, suppose that growth takes place in the aggregate and that everybody's real income increases. If the poor gain 5 percent in income and the rich gain 20 percent, poverty has decreased (because the poor are less poor) but inequality has increased (because the ratio of the income of the rich to that of the poor is higher than it was).

The conclusions drawn about the change in income distribution depend on whether absolute poverty or relative inequality takes precedence in the evaluation. This article gives the two criteria equal weight.

Early research on income distribution emphasized natural economic laws intended to describe how income distribution changes with economic growth. Probably the best known is Kuznets' law, commonly but inaccurately paraphrased as follows: Income distribution must get worse before it gets better.

Kuznets' law dealt with relative inequality; not with absolute poverty. Other early studies of the effect of economic growth on poverty and inequality followed a similar methodology,

which was to look across countries and relate income distribution to level of national income. The cross-section method entailed two assumptions: that the pattern of income distribution at any given time reflected the time path followed by the then developed countries in their growth, and that the time paths followed in the past could be followed in the future. The reason for this methodology and its accompanying assumptions was quite practical: cross-sectional data were the only ones then available for developing countries. This precluded answering questions about growth and distribution by using intertemporal data. Some such data were then available for more industrialized countries (Kuznets 1963).

Studies in the early 1970s (such as Weisskoff 1970 and Fishlow 1972) began to present data on changes over time in inequality and poverty for individual developing countries or groups of countries. With these data available, the research task became one of synthesizing the findings on individual developing countries. Fields (1980) conveys data on changes in inequality and in poverty for thirteen developing countries. Fields (1988) reviews the major studies of this type. The data underlying this paper are presented in Fields (1989a), and the analysis is detailed further in Fields (1989b).

For reasons of practicality I measure poverty by the headcount ratio and inequality by the Lorenz curve and the Gini coefficient. A poverty line is a level of income or expenditure below which a recipient (expressed as household, individual, or per capita) is said to be poor. The headcount ratio is the fraction of all recipients who fall below the poverty line. The Lorenz curve is a method commonly used to show income distribution. The inequality of a country's income distribution in one year may be ranked against the inequality in another year by comparing Lorenz curves. Possible outcomes are Lorenz improvement (inequality has decreased according to the most common measures of inequality), Lorenz worsening (inequality has increased according to these measures), and Lorenz crossing (inequality has increased according to some measures and decreased according to others). The most common measure of inequality is the Gini coefficient. In principle, it ranges from zero (perfect equality) to one (extreme inequality); in practice, the approximate range of Gini coefficients is 0.3 to 0.7.

Academic economists and statisticians debate the merits of various indexes of inequality and poverty, but to use any inequality index other than the Gini coefficient would require painstaking work to gather the data and compute, say, a Theil index. More sophisticated poverty indexes, such as the Sen family of indexes or the Pa class, do not exist for developing

countries, nor can they be produced, given the highly aggregated level of = published income categories. Some of the more refined measures of inequality and poverty will probably not exist for developing countries until the twenty-first century.

It must be recognized that the findings in this study are based on less than ideal data. Although the use of micro survey time series data is a large step forward from the use of aggregative cross-section data, it is only an initial step, and it does not resolve some critical problems. Most serious among these problems is that Kuznets posited long-term relations, spanning several generations, whereas the periods for which data are available are seldom longer than two decades and, on average, are closer to ten years. There might be evidence of trends, but the variation within those trends may obscure longer-term movements.

Similarly, the number of years of data available for each country is limited. Gini coefficients, for instance, are calculated using, on average, three observations per country (there are fourteen countries for which there is only one observation, and one country for which there are eight). The trends uncovered will depend on the years for which data are available; if, in the last year or two for which data are available, a country experiences a natural resource boom or election year expansion, this tends to suggest stronger overall growth than that which actually occurred.

Most of the measures of poverty and inequality on which I draw are based on estimated monetary income, which has two implications for the analysis. First, it does not deal with the issue of quality of life, which arises from the definition of poverty. It also accepts income as the best available measure of poverty. Given these issues, and the difficulty in measuring and comparing across countries, some researchers use nonmonetary indicators of poverty, such as rates of birth, infant mortality, child and adult death, literacy, and school enrollment; life expectancy; availability of safe water and medical services; and caloric and protein intake (World Bank a and b, various years). Second, income measures may not adequately capture informal sector income, the value of food grown and consumed by the family, and other economic activity that goes unreported or unestimated. As an economy develops, however, it is expected that a larger share of income will be generated through the market and thus measured, so that. The bias should be one of extent of movement, rather than direction. Some of the technical aspects of measurement and data collection are discussed in the annex.

### **Findings on Poverty, Inequality, and Growth**

This section presents seven hypotheses and findings using the data on inequality and poverty compiled in Fields (1989a) and analyzed in Fields (1989b). Many hypotheses causally link economic growth to inequality. Some researchers speculate that inequality may tend to increase systematically with economic growth (this is designated hypothesis 1 in the following discussion), that this may occur more frequently in low-income countries than in high-income countries (hypothesis 6), and that it may occur more often in Latin America than in Asia (hypothesis 7). Two hypotheses relate the extent of inequality to the extent of economic growth. One (hypothesis 2) holds that inequality is more likely to increase the more rapid is economic growth, and another (hypothesis 3) is that greater inequality in the initial distribution of income facilitates more rapid economic growth. Many of these hypotheses are not supported by the empirical evidence.

Other hypotheses, relating to poverty, are less controversial: that poverty tends to decrease with economic growth (hypothesis 4) and especially with rapid economic growth (hypothesis 5). These hypotheses are supported by the data.

In what follows, the discussion of a given country is based on data on that economy from the earliest date for which information is available. A spell is a period from a base year to a terminal year (both chosen according to the availability of data on income distribution). A growth spell is a spell in which a country experienced a positive rate of growth of gross national product (GNP) per capita. See "Units of Analysis," in the annex, for details.

*Hypothesis 1.* There is a systematic tendency for inequality to increase with economic growth.

*Discussion and evidence.* The earliest studies of the change in inequality in developing economies concluded that inequality had increased in Argentina, Mexico, and Puerto Rico (Weisskoff 1970) and in Brazil (Fishlow 1972). This led many to conclude that inequality might tend to rise with economic growth in the developing world. Adelman and Morris (1973, pp. 1-2) did not equivocate: "Indeed, it has become clear that economic growth itself . . . is one of the prime causes of income inequality." Loehr and Powelson (1981, pp. 133-34) fit a linear regression relating the Gini coefficient in fifteen developing countries to their per capita GNP and found an upward-sloping relationship.

Both Adelman and Morris and Loehr and Powelson drew their conclusions from crosssectional rather than time series data. Studies using time series data have found little evidence to link inequality and growth. Ahluwalia (1974) reported data on changes in the income share of the poorest 40 percent of the

population in thirteen developing countries. He found six in which inequality increased, six in which inequality decreased, and one in which inequality was unchanged. Later evidence, compiled by Fields (1980) for a somewhat different set of countries, found that inequality rose in seven countries, fell in five, and seemed unchanged in one. Judging from these time series findings, inequality seems to have increased with economic growth of developing countries about as often as it has decreased.

I have compiled new evidence on the change in inequality for twenty-two developing countries, consisting of seventy spells.<sup>2</sup> Inequality is measured in two ways: by the Lorenz curve, which allows researchers to compare relative inequality regardless of the specific inequality index used; and by the Gini coefficient, which, despite being controversial, is available in many more cases.

The data show ten countries in which the Gini coefficient increased over time, eleven in which it decreased, and one in which it was unchanged. When spells are measured, the Gini coefficient increased in thirty-one spells, decreased in thirty-five, and was unchanged in four. Thus, with the Gini coefficient as the basis for comparing inequality, the number of countries and spells in which inequality increased is nearly the same as that in which inequality decreased.

Lorenz curves are available for fewer countries than are Gini coefficients, so fewer inequality comparisons can be made. Those that can be made, however, are unambiguous for the class of Lorenz-consistent inequality measures. The evidence reveals five countries in which inequality increased, six in which inequality decreased, and six in which the results were ambiguous because the Lorenz curves crossed. Inequality increased in seventeen spells and decreased in twenty-one; the results for fifteen spells were ambiguous because of crossing of curves. The analysis by Lorenz curve yields the same conclusion as that by Gini coefficient: inequality increases about half the time and decreases about half the time.

*Finding.* Contrary to the hypothesis, the evidence shows no tendency for inequality to increase or decrease systematically with economic growth. Whether the study examines countries or spells, uses Lorenz curves or Gini coefficients, inequality appears to increase as often as it decreases.

*Hypothesis 2.* Inequality is more likely to increase the more rapid is economic growth.

*Discussion and evidence.* Ahluwalia (1976) attributed the relation between a high economic growth rate and increased income inequality to short-term pressures associated with high growth rates. Among these pressures were lags in factor mobility

and consequent dispersion of income differentials. This, he believed, explained the increase in income inequality in Brazil between 1960 and 1970.

One set of tests by Ahluwalia was based on cross-country data. For each country the dependent variable was inequality as of the most recent date. To test the hypothesis, he included the rate of growth of gross domestic product (GDP) in the ten preceding years as an additional explanatory variable in the cross-section regressions. The coefficient of the growth rate variable was never statistically significant. He concluded that a higher rate of growth of GDP is not responsible for higher inequality. The same conclusion was reached in a more recent study by Papanek and Kyn (1987), also using cross-sectional data.

When intertemporal data were used in tests, the results were similar. Ahluwalia (1974) examined the change in inequality in eighteen industrial and developing countries and related the changes to the rate of growth of national income. He found that "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" (p. 13). Subsequently, I reached the same conclusion, using a sample of six developing countries for which the data on changes in inequality over time were more reliable (Fields 1980, table 7.2). Thus the intertemporal data and the cross-sectional data yield the same result: "the absence of any marked relationship between income growth and changes in income shares" (Ahluwalia 1974, p. 13).

To see whether newer data support the hypothesis linking economic growth with income inequality, data were divided into spells in which the Gini coefficient increased, spells in which it decreased, and spells in which it was unchanged. Growth rates of GNP per capita and of internationally comparable purchasing power (ICP) were calculated for as many of these spells as possible. The growth rates among spells in which the Gini coefficient increased vary widely, as do the growth rates among spells in which the Gini coefficient decreased. This result suggests that inequality need not increase with rapid economic growth.

Despite the lack of a pattern, there may be some tendency, as seen by comparing the average growth rate during spells in which inequality increased with that during spells in which inequality decreased. The data show that the average growth rate of GNP is somewhat lower in those spells in which inequality increased than in those in which inequality decreased. If the average growth rate of ICP is the criterion,

the opposite seems true: the growth rate is higher in those spells during which inequality increased than in those during which inequality decreased. Further tests, however, showed no statistically significant relation between the rate of growth during a spell and the tendency for inequality to increase or decrease. (Probit analysis relating an increase in the Gini coefficient [ $Pr(D=1)$ ] to growth of GNP per capita and to growth of ICP per capita produced probit coefficients of 3.14 [ $t$ -statistic of 0.64] and -1.96 [0.37] respectively.)

*Finding.* The evidence is mixed. In tests using the growth rate of GNP as an indicator, more rapid economic growth is associated with lower inequality, whereas inequality is seen to increase when the growth rate of ICP is used. Neither result, however, is statistically significant. These results do not support the claim that inequality is more likely to increase the more rapid is economic growth.

*Hypothesis 3.* The less even the initial distribution of income, the higher is the economic growth rate.

*Discussion and evidence.* According to the Harrod Domar model, if the rich save and invest much of their income and the poor spend most of theirs, then savings, investment, capital formation, and hence growth will be higher the larger is the initial income share of the rich. This argument has been repeated by others, including Griffin and Khan (1972) and Sheehan (1980), who argued that high growth requires the enrichment of high-income investors, managers, and landowners.

To test this hypothesis, the average growth rate of GNP per capita for each spell was plotted against the Gini coefficient for the initial year of the spell; these variables appear to be uncorrelated. (The Pearson correlation coefficient was -0.16, not significantly different from zero.) A similar plot of growth rate of ICP against initial Gini coefficient yields a correlation coefficient of -0.14. Correlation coefficients so close to zero suggest that inequality in the distribution of income is not a force behind economic growth.

*Finding:* I uncover no statistically significant relation between inequality in the initial distribution of income and the subsequent rate of economic growth.

*Hypothesis 4.* Poverty tends to decrease with economic growth.

*Discussion and evidence.* Two views of poverty and growth are usually put forward. The optimistic position is that the poor do participate in economic growth and that absolute poverty is thus reduced. Development economists in the 1950s and 1960s assumed that growth would reduce absolute poverty, which is why growth consumed the attention of development economists, whereas poverty was rarely examined directly.

The more pessimistic position is that the poor do not necessarily, or even usually, participate in economic growth. At best, growth does not benefit all of the poor. Griffin (1977), for instance, showed which groups of poor did not enjoy income gains (absolutely or relatively) during economic growth in various countries. Even if the gains among the poor as a group outweigh the losses among them, resulting in a decline in the rate of poverty or in its severity, it is clear that not everyone benefits.

A more interesting issue is whether the poor tend systematically to be excluded from economic growth and thereby to be rendered poorer. Adelman and Morris (1973), using cross-sectional evidence, wrote, "Our conclusions . . . underline the urgent need to discard as outmoded the view that economic growth in low-income countries benefits the masses. . . . Development is accompanied by an absolute as well as a relative decline in the average income of the very poor" (pp. 3, 189). Their methodology, however, has been severely criticized by many, such as Cline (1975), as being "indirect" and thus suspect. Their empirical claim that poverty rose in the cross-section was rejected by Ahluwalia (1976), who showed that when countries at different income levels were compared, the average absolute incomes of the poorest 20 percent, 40 percent, and 60 percent increased monotonically. The idea that absolute impoverishment arose from economic growth was laid to rest, at least in studies using cross-sectional data.

What about intertemporal data? After all, the hypothesis that growth reduces poverty is really one about changes in countries over time. Working independently, Ahluwalia, Carter, and Chenery (1979) and Fields (1980) found that economic growth accompanied by an increase in poverty is the exception. In the former study, data from twelve countries showed no instance of an increase in poverty: real per capita income increased among the poorest 20 percent in each case. In the latter study, poverty was found to decrease in ten out of thirteen countries, to increase in two, and to exhibit no dear change in one. In one of the two cases in which poverty rose, economic growth was negative. In the case in which poverty was constant, economic growth was negligible. In only one case was poverty found to rise in a growing economy. Inter evidence therefore indicates that economic growth tends to reduce poverty.

In the 1980s, many developing countries have had negative economic growth. If economic growth tends to lower poverty, then economic decline should increase poverty. A number of studies (for example, Addison and Demery 1985, World Bank 1986, Edgren and Muqtada 1986, ECLAC 1986, Tokman and Wurgaft 1987, Aboagye and Gozo 1987, Lee 1987, and UNICEF 1987) suggest that this is

the case. The statistical basis for these claims, however, is considerably less than ideal.

Data compiled for this article can be used to test the hypothesis that economic growth tends to reduce poverty. Of the eighteen countries with consistent data on poverty over time, 6 poverty fell in fourteen, rose in three, and exhibited no clear tendency in one. In two of the three cases in which poverty rose, the economy had suffered an economic decline. In only one case was positive economic growth not accompanied by a fall in poverty.

*Finding.* The hypothesis is supported by the evidence considered here: In almost all cases poverty declines as the economies grow.

*Hypothesis 5.* Poverty is more apt to decrease the more rapid is economic growth.

*Discussion and evidence.* If there were a standard international poverty line, the extent of poverty reduction could be measured and related to countries' rates of economic growth. But it makes little sense to compare the percentage change in poverty across countries using each country's own poverty line; to do so would be like comparing apples and oranges. Given the limitations of the data, it is better to look at whether poverty increased or decreased rather than to try to determine the extent of change.

The data reveal that in all but one spell with a growth rate above 3 percent, poverty was found to decrease. The instances of increase in poverty or mixed evidence were concentrated in the spells with GN P decline or with growth rates of less than 3 percent. When the change in poverty is related to the growth rate of ICP, the data tell the same story.

Tests run on these findings reveal that the effect of high growth on poverty reduction is statistically significant at conventional levels. (Probits relating the decline in poverty [one if there was a decline, zero if not] to the growth rate of GNP or ICP yielded probit coefficients of +0.325 f t-statistic of 2.36] for GNP and + 0.420 (2.16) for ICP.)

*Finding.* The data suggest that poverty is more apt to decrease the more rapid is economic growth.

*Hypothesis 6.* Growth tends to raise inequality in low-income countries and to reduce inequality in high-income countries.

*Discussion and evidence.* Kuznets (1955) measured inequality in five countries and found greater inequality in industrial countries than in developing ones. This result was sustained in later studies of larger samples of countries, first by Kravis (1960) and then by Kuznets (1963). Both Kuznets and Oshima (1962) reasoned that developing countries had greater equality

in their earlier stages of development because everyone was thought to be more or less equally poor. From this emerged the hypothesis of the Kuznets curve—the idea that income inequality increases in the early stages of economic development and decreases in the later stages, thus tracing an inverted **U**.

The Kuznets curve has received support in cross-sectional studies by Paukert (1973), Cline (1975), Chenery and Syrquin (1975), Ahluwalia (1976), and Papanek and Kyn (1987), among others. In an econometric study allowing for various functional forms, however, Anand and Kanbur (1986) found that the cross-sectional data were best fit by a U-shaped curve, not an inverted **U**. In any event, regardless of which cross-sectional pattern is correct, the hypothesis that growth raises inequality in low-income countries and lowers it in higher-income countries is a statement about change over time and is properly tested using intertemporal data. Only recently has there been sufficient data on changes in inequality over time in various countries' development experiences to permit this hypothesis to be tested intertemporally.

To determine the effect of growth on inequality in the high-income and low-income groups, a spell is included here if it is a growth spell (spells of economic decline are omitted). The division between high-income and low-income countries was set at US\$728 in 1980 prices; this is the level of GNP in 1980 prices at which income inequality was found to have peaked in the cross-sectional study by Paukert (1973).

In low-income countries, ten out of twenty-one growth spells (48 percent) were marked by an increase in inequality. In high-income countries, it was nine out of twenty-two (42 percent). These two percentages are not significantly different from one another.

*Finding.* In the data considered here, inequality increased with growth as frequently in low-income countries as in high-income countries. There appears to be no tendency for inequality to increase more in the early stages of economic development than in the later stages.

*Hypothesis 7.* Growth tends to bring about an increase in inequality more in Latin America than in Asia.

*Discussion and evidence.* Inequality is higher in Latin America than in Asia (Ahluwalia, Carter, and Chenery 1979, p. 482; Loehr and Powelson 1981, p. 134). It is generally thought that the Asian economies with rapid economic growth (Japan, Hong Kong, the Republic of Korea, Singapore, and Taiwan) have had more equal distribution of land, capital, and education than have Latin American countries and that these Asian economies have engaged in much more labor-intensive production than have the newly industrializing countries of Latin America (Ranis

1981). It might be expected, then, that the fruits of growth are distributed more equitably in Asia than in Latin America.

The work of Ahluwalia, Carter, and Chenery (1979) supports this contention. Using data over time, these authors classified countries into three groups (with good, intermediate, and poor performance) based on the income share of the poorest 60 percent of the population in the latest year and the share of increase in income going to this group. The performance of Asian economies is generally good, and that of Latin American countries generally poor.

To test my data, I divided the growth spells (those in which GN P growth was positive) by region. In five out of the nine Latin American growth spells, the Gini coefficient increased; the Gini coefficient increased in twelve out of twenty-eight Asian growth spells. That is, the Gini coefficient increased in 55 percent of the Latin American growth spells and in 43 percent of the Asian growth spells. These differences, though notable, are not statistically significant.

*Finding.* Although inequality appears to have increased with growth more frequently in Latin America than in Asia, the results do not differ statistically.

### **Conclusions and Directions for Future Work**

In this analysis economic growth nearly always is associated with a reduction in absolute poverty. There are exceptions, but the tendency is for the poor to be rendered less poor by economic growth and poorer by macroeconomic decline.

No relation is found between the change in inequality and the rate of economic growth or between the change in inequality and the level of national income. This suggests that the decisive factor in determining whether inequality increases or decreases is not the rate of economic growth but rather the kind of growth.

No statistically significant relation is found between inequality in the initial distribution of income and subsequent economic growth. This suggests that countries need not maintain unequal income distribution to grow rapidly.

Most countries have had very modest changes in income inequality over time. This suggests that, in most cases, different income groups have benefited from economic growth (or suffered from economic decline) approximately in proportion to their original incomes.

It is hoped that future work on this subject will be able to take advantage of internationally comparable standards for inequality or poverty, so that cross-country comparisons will be

more meaningful. Future data-gathering efforts should be more standardized.

It has not always been possible to confirm the comparability of sources within a country. Those more knowledgeable about a particular country's household survey or census program may have good reason to question comparability. Further in-depth study of individual country sources is in order. In this study minimal criteria for the exclusion of data have been used. 8 Yet even these criteria have been criticized as excessively stringent. I would not feel confident with findings based on anything looser.

At present, the data offer much more information on inequality in developing countries than on poverty. This does not reflect my personal priorities or those of many others-I would first calculate poverty rates and only later worry about inequality-but rather the priorities of the countries' statistical offices or researchers themselves. For the world's preeminent development institution not to have data on changes in poverty in developing countries is shocking. The improvement of the data base on poverty merits the highest priority.

#### **Annex: Data Used for This Article**

Data on income distribution in developing countries were sought in numerous sources, including papers from the World Bank's research project on the political economy of poverty, equity, and growth (Bevan, Collier, and Gunning 1988; Bruton 1988; Favaro and Bension 1988; Findlay, Wellisz, and others 1988; Gonzalez-Vega and Cespedes 1988; Hansen 1988a, 1988b; Maddison and others 1988a, 1988b; Meesook, Tinakorn, and Vaddhanaphuti 1987; Pryor 1988; Urdinola and Carrizosa 1988; and Webb 1988); World Bank a 1988; World Bank b 1987; Jain 1975; Adelman and Morris 1973; Paukert 1973; United Nations 1981, 1985; International Labour Office 1984; Fields 1980; World Bank country economic memoranda; and statistical yearbooks, reports on censuses and household surveys, and research studies.

Data were found in one or more of these sources for seventy developing economies in Africa, Asia (including Oceania), and Latin America (including the Caribbean). For exactly half of these countries, no data were deemed usable, because they did not satisfy the criteria listed in note 8. Those that did are described in the following.

#### *Units of Analysis*

Different units of analysis were used to test the hypotheses in this article. The choice depended on the

particular hypothesis and the availability of data with which to answer it. The following terminology is used:

- A *country* refers to the experience of an economy from the earliest possible date for which information is available until the latest date. "Costa Rica, 1961-82" is one such country.
- A *spell* refers to the experience of an economy from a base year (chosen for the availability of data) until a terminal year (chosen in the same way). The experience of a country may be divided into one or more spells. For instance, Costa Rica has four spells: 1961-71, 1971-77, 1977-79, and 1979-82.
- A *growth spell* is a spell in which the country experienced a positive rate of growth of GNP per capita. Costa Rica experienced positive economic growth in the intervals 1961-71, 1971-77, and 1977-79 and suffered a serious economic recession in the interval 1979-82. The first three of these are growth spells; the fourth is not.

#### *Income Level and Income Growth*

Although some of the hypotheses relate only to the passage of time, others relate to the level of GNP or to the rate of economic growth. These data were taken from various sources.

The GNP data are for GNP per capita, measured in 1980 U.S. dollars. These are taken from International Monetary Fund 1984.

The growth rates of GNP were calculated from data for 1960-86 from World Bank 1988. Comparable GNP figures for earlier and later years were unavailable. Most of the economies included in the data used in this article are also included in International Monetary Fund 1984 and World Bank 1988. The Bahamas and Puerto Rico, however, are not. Although GNPs and GNP growth rates for these economies are available elsewhere, in view of other noncomparabilities in GNP data, these other sources were not included here.

As an alternative basis for estimating economic growth, I used the data from the International Comparison Project, as reported in Summers and Heston (1988) and as described there and in Kravis (1986). These estimates avert a number of problems, the most important of which is the distortion introduced by using official exchange rates to convert GNP in local currency to GNP in dollars (the standard numeraire).

The countries, spells, and dates covered by the ICP growth rates differ from those for the GNP growth rates. The findings on in-growth rates. The findings on inequality, poverty, and economic growth presented in the following are more convincing insofar as the two growth estimates and the two different sets of countries and spells yield qualitatively similar results.

### *Availability of Data*

Usable data on income distribution are available for a large number of developing economies. World Bank sources should be expanded to incorporate more of these data.

Much of the available information fails to fulfill minimal criteria of acceptability. It is impossible, however, readily to determine this from the sources themselves. It is only by looking into more basic sources, one country at a time, that the acceptability of the data can be determined.

The information contained in the papers of the project on poverty, equity, and growth proved to be quite limited. Of the papers available at the time of this writing (on twenty countries), those on only ten of the project countries were found to offer national data on the change in inequality over time, and data on changes in absolute poverty were available for only five countries. To assess how growth affects inequality and poverty, we must turn elsewhere for additional information.

When suitable income distribution data do exist, the form of presentation of the data—especially of data on poverty—is very limited.

Among the thirty-five countries for which suitable data on inequality or poverty (or both) were found, usable information was located for at least two years in the case of twenty-two countries and for one year in the case of thirteen. For many of these countries, data for other years existed but were deemed unusable. A full listing of the data on Gini coefficients and absolute poverty and of the relevant sources may be found in an earlier report (Fields 1989a).

### *Desired Measures and the Practical Resolution*

Academics who have been studying how growth affects inequality and poverty have long wrestled with questions about conceptual measurement that would need to be resolved if one were starting from scratch and devising a time series on poverty or inequality or both. Among the points to be decided are the preferred recipient unit (individual, household, or per capita), the preferred income concept (cash income, income including imputations, expenditure, or per capita income), the preferred poverty measure (the headcount ratio, the Sen index and generalizations therefrom, or the Pa class Class suggested by Foster, Greer, and Thorbecke 1984), and the preferred inequality measure (income share of the richest or poorest  $x$  percent, Gini coefficient, Theil index, Atkinson index).

Inequality analysts wish to know about Lorenz curves and Lorenz-based inequality indexes. Lorenz curves are rarely presented, nor, often, is the information needed to compute

Lorenz curves. As for the Lorenz-based inequality indexes, if we are lucky, Gini coefficients are already calculated. If we are less lucky, we have the information from which we can calculate our own Gini coefficients. Sometimes we cannot even do that.

As for poverty indexes, most countries have not published such data. In the few cases where this information has been published, it has typically been a headcount ratio—the fraction that is poor according to some poverty line. In some cases, the changes in different groups' real incomes are available instead. The fraction that is poor can be calculated for many more countries than it has been, but to do so will be difficult and tedious: the underlying income distributions, poverty lines, inflation rates, and intragroup distributions will have to be determined country by country, year by year. To have such information is essential. Not to have it is deplorable.

In sum, what we have are Gini coefficients to measure inequality and, typically, headcount ratios to measure poverty. Those data constitute the basis for the statistical analysis presented in this article.

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