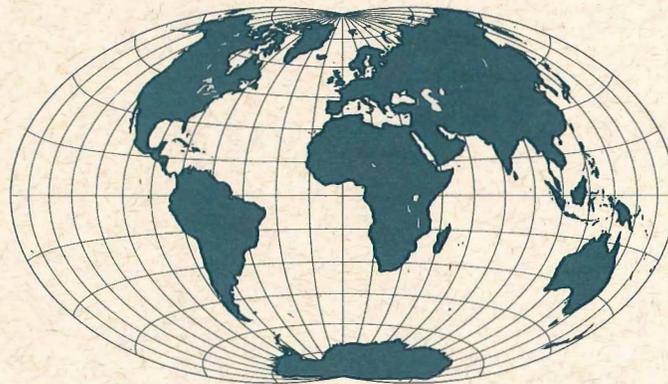# CAER

CONSULTING ASSISTANCE ON ECONOMIC REFORM II

DISCUSSION PAPERS

Does Economic Growth Reduce Poverty?
Technical Paper

Michael Roemer
Mary Kay Gugerty

HIID

CAER II Discussion Paper No. 5
April 1997

CONSULTING ASSISTANCE ON ECONOMIC REFORM II

DISCUSSION PAPERS

The objectives of the Consulting Assistance on Economic Reform (CAER II) project are to contribute to broad-based and sustainable economic growth; and to improve the policy reform content of USAID assistance activities that aim to strengthen markets in recipient countries. Services are provided by the Harvard Institute for International Development (HIID) and its subcontractors. Funded by the U.S. Agency for International Development (Contracts PCE-0405-C-00-5015-00 and PCE-0405-Q-00-5016-00), it gives A.I.D.'s missions and Washington offices access to economists and other social scientists with extensive practical experience who are highly regarded within their professional disciplines. Some of the CAER work generates results of interest to a broad audience. The CAER discussion papers series provides a convenient and consistent form in which to share these results.

Does Economic Growth Reduce Poverty?
Technical Paper

Michael Roemer
Mary Kay Gugerty   🏛 **HIID**

DOES ECONOMIC GROWTH REDUCE POVERTY?

Technical Paper

Michael Roemer and Mary Kay Gugerty

Harvard Institute for International Development

March 1997

DOES ECONOMIC GROWTH REDUCE POVERTY?

ABSTRACT

The study examines the question of whether economic growth tends to reduce poverty, where poverty is measured by the incomes of the poorest 20% and 40% of a population. Using the most recent data available, the paper shows that an increase in the rate of GDP growth translates into a direct one-for-one increase in the rate of growth of average incomes of the poorest 40%. **GDP growth of ten percent per year is associated with income growth of ten percent for the poorest 40% of the population. For the poorest 20% the elasticity of response is 0.921; GDP growth of 10% is associated with income growth of 9.21%.** These results give strong support to the proposition that growth in per capita GDP can be and usually is a powerful force in reducing poverty.

In addition, the paper indicates that sound macroeconomic policies and openness to the world economy may be important in reducing poverty. These policies operate mainly through the effect on economic growth: countries with better macroeconomic policies grow faster, and this growth alleviates poverty.

I.   THE RELATIONSHIP BETWEEN GROWTH AND POVERTY ALLEVIATION

Introduction

The persistent problem of poverty in the developing world has led many to question the efficacy of economic growth and development as a means of poverty alleviation. Indeed, the lack of convergence in standards of living across countries is one of the great unresolved issues in development and growth economics. The prevalence of poverty may also lead to a pessimism about the effects of market-oriented policies and outward looking development strategies. In response to these views, this paper shows that economic growth is positively associated with reductions in poverty, and that openness and sound macroeconomic management are associated with higher growth and therefore with reductions in poverty.

Identifying the growth strategies that are particularly effective in reducing poverty is crucial to USAID's mission.   If Agency policies are focused on interventionist means to alleviate poverty, rather than on promoting economic growth, the net result could well be less growth and therefore more poverty. The USAID constituency which promotes less market-oriented strategies and more direct interventions to attack poverty has received an increasing share of the Agency's scarce resources in recent years. Thus the effectiveness of the U.S. foreign aid program depends upon reaching an understanding about the extent to which economic growth does reduce poverty in developing and transitional economies.

This paper is organized as follows. The first section of the paper reviews the analytic arguments connecting growth and poverty alleviation. The second section explains the economic tools used in poverty measurement and evaluation. Section three presents evidence on the connection between growth and poverty reduction. The fourth and final section reviews the relationship between economic structure, growth, and poverty alleviation. A summary of these results is provided in the companion presentation paper.

The Debate over Poverty Reduction Strategies

Most economists believe that economic growth benefits nearly all citizens of a country, even if not equally, and therefore reduces poverty. The extent to which these benefits are realized by various groups is reflected as change (or lack of change) in the distribution of income.   If economic growth raises the incomes of everyone in a society in equal proportion, then the distribution of income will not change.

Two arguments are often made against the proposition that economic growth reduces poverty. First, the Kuznets curve hypothesis proposed by economist Simon Kuznets in 1955 holds that as incomes grow in the early stages of development, income distribution would at first worsen and then improve as a wider segment of the population participated in the rising national income. If income distribution became dramatically less equal with growth, poverty might not be declining. Our study finds that income distribution does not change dramatically in most countries,

even over relatively long periods of time. In addition, the data in this paper indicate that the Kuznets hypothesis does not seem to hold for most individual countries that are currently developing.

Second, the obvious depth and persistence of poverty has created doubts about the ability of economic growth to reduce poverty; these doubts are especially prevalent among development professionals working directly with the poor in developing countries. In addition, stabilization and structural adjustment measures that are prescribed to promote growth are widely perceived to deepen poverty, particularly in the short run, casting further doubt on the wisdom of attacking poverty through faster growth. While there is little empirical evidence on the relationship between structural adjustment and poverty alleviation, this paper demonstrates that the policies promoted by structural adjustment, namely openness to the world economy and sound fiscal and macroeconomic management, do tend to reduce poverty through their effects on growth. Unfortunately, other than through the effect of raising incomes, few data are available to address the relationship between economic growth and the welfare of the very poorest members of society.

Economic Structure and Income Distribution

As noted above, for growth to occur **without** a reduction in poverty, income distribution must become more unequal. Could rapid growth take place without any reduction in poverty? It is possible but unlikely, as many studies now show. Moreover, it is possible for income distribution to worsen somewhat while the incomes of the poor nonetheless increase.

The extent to which a given rate of growth affects poverty depends upon many factors, but particularly on economic structure and economic policies. Growth is more likely to lead directly to a reduction in poverty when the economic assets of a country are distributed relatively equally or when economic growth is based on the intensive employment of abundant factors of production, which for most countries is labor. Section IV presents recent empirical evidence on this topic.

In largely rural economies based on small-scale farming, as in many African and Asian countries, most of the poor are engaged in agriculture. When such a country grows through agricultural exports, or when growth in manufacturing increases the demand for food and materials supplied by the rural sector, growth benefits both poor farmers and the even poorer laborers they employ. In land-poor but labor-abundant economies, such as those of East Asia, rapid growth of manufactured or service exports creates a large pool of new jobs, absorbs the supply of low-productivity workers, and eventually causes a rise in real wages that further reduces poverty.

In contrast, mineral-rich economies typically have very concentrated income distributions; the country's wealth is in very few hands. Thus, when growth comes from mineral exports, the market mechanisms that would involve the lower income groups in that growth are weak. The

best means for poverty alleviation in such countries may involve government programs to channel mineral revenues to the poor through education, health, rural works and other activities that will attract private employers.

Development strategy and economic policies may also have differential impacts on the reduction of poverty via their impact on growth. Economic strategies and policies also affect distribution by altering the way an economy generates and absorbs economic growth. Outward-looking policies, for example, encourage a country to intensify its production in industries that employ abundant, and therefore low-cost, resources. If these economies are either labor-abundant or both land- and labor-abundant, these policies will enhance the impact of growth on poverty alleviation. But if the economy is mineral-rich, or if it has concentrated agriculture in the hands of a few wealthy landowners, the impact on poverty will be weak.

The market reforms espoused in structural adjustment should enhance the impact of growth on poverty. The reduction in controls reduces rent-seeking, which tends to concentrate income and wealth. More importantly, it opens market access to a wider group of participants, including the powerless and the poor. This effect can be especially strong when the controls that are targeted for elimination have affected the rural economy, such as export marketing boards, price and marketing restrictions on foodgrains, or when they have restricted entry to the informal sector, especially rural trading and curbside retailing in cities.

The analytic arguments presented here suggest that growth tends to reduce poverty and that openness and an outward trade orientation decrease poverty through their effects on growth. The data presented in this paper support these assertions.

II.   DEFINING AND MEASURING POVERTY

Any analysis of poverty reduction will clearly be limited by the data on poverty available at the national level. Data on poverty levels that are comparable across countries has been until recently quite difficult to obtain and quite inconsistent in quality.   Even when data are not available, however, it is instructive to review some of the main concepts used in the economic analysis of poverty, as they highlight many of the important measurement issues. The following section reviews the advances made in the last few decades in the tools available for empirical measurement and evaluation of poverty.

Using Income Distribution to Measure Poverty

The most straightforward measure of poverty in principle is the headcount index of poverty, which measures the number of people with income below a certain level. In practice, these data are often not available, or are not available in a format comparable across countries. Instead the distribution of income among members of a population is used to indicate the relative amount of poverty in a country. The simplest form for presenting income distribution data is a *frequency distribution* that shows the income shares of income groups, ranked in ascending order

of income. This data usually lists the income share of each quintile (20%) of the population. Ideally, one would want even more detailed information, for example the income share of each decile (10%) of the population. In practice these data are rarely available for developing countries.

The data used in this paper are from a **cumulative** frequency distribution, showing the shares of the poorest 20, 40, 60, 80 and 100% of the population. This is simply the sum of the shares for each group. Figure 1 illustrates the frequency distribution and cumulative frequency distribution for a hypothetical developing country with income distribution similar to India's.

Figure 1:
Frequency Distribution of Income
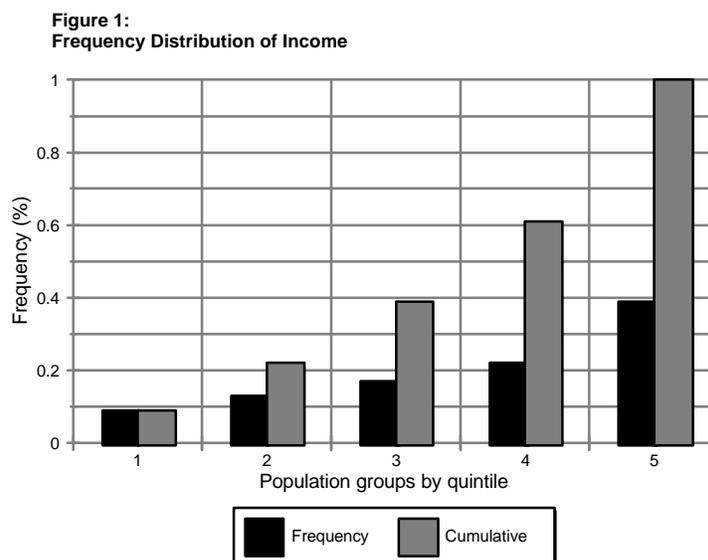
The **Gini coefficient** is often used as an indicator of the relative equality of income distribution in a given country. The Gini coefficient measures how far a country's income distribution is from perfect equality. A coefficient of zero would indicate perfect equality, while a coefficient of 1 would indicate perfect inequality. Most income distributions fall in the range of .20 to .60. In our sample, the Gini coefficients range from .293 (Bangladesh in 1992) to .596 (Brazil in 1989).
Measuring Income Distribution: An Example

As noted above, the concept of income distribution is closely related to poverty reduction. The example below demonstrates this relationship for the same hypothetical developing country shown in Figure 1. Table 1 demonstrates that for growth to occur without a reduction in poverty, the worsening of the income distribution must be substantial.

4

Table 1: **Growth, Poverty and Income Distribution: Calculations for a Hypothetical Economy with Characteristics like India**

Income group (quintile)	1990		2000 same distribution + 4% growth		2000 with same income for poorest 40%	
	Average income	Cumulative share (%)	Average income	Cumulative share (%)	Average income	Cumulative share (%)
Poorest	45	9	67.5	9	45.0	6
Second	65	22	97.5	22	65.0	15
Third	85	39	127.5	39	139.5	33
Fourth	110	61	165.0	61	180.5	57
Richest	195	100	292.5	100	320.0	100
Entire pop'n	100		150		150	
Gini coef.		0.276		0.276		0.355
Poverty (% head count)		40		**< 20**		40

The distribution in 1990 is relatively equal, as indicated by the Gini coefficient of 0.276. We arbitrarily define the poverty line so that the bottom 40% of the population live in poverty in that year. Now suppose that average income grows by four percent a year for ten years, and the distribution of income remains the same. After ten years the average income of the poorest 20% will have risen above the 1990 poverty line. Thus all of the second 20% of the population and an undetermined number of the poorest 20% will have incomes above the poverty line.

Could such rapid growth take place without any reduction in poverty? The last two columns show that it is possible, but quite unlikely. Here we assume that the poorest 40% gain no income and the poverty count therefore remains at 40%. For that to happen, the upper 60% must have large income gains and the share of the poorest 40% must shrink from 22% to 15%, while the Gini rises to 0.355. Obviously, if the poor are to become worse off the distribution has to become even less equal. Such outcomes are rarely seen in historical experience. Gini coefficients tend to be fairly stable over time: a change of more than 0.05 over a decade would be large, though not unknown. Thailand's Gini rose from 0.38 to 0.50 from the 1980s to the 1990s, by far the largest change in the past 30 years (Bruno, *et al.,* 1996). Even with that relatively large change in income distribution, however, incomes of the poorest 20% and 40% of population nevertheless increased because of Thailand's rapid economic growth.

Thus the hypothetical change in the Gini coefficient of the magnitude discussed in Table 1 (from .276 to .355) appears extremely rarely in reality. This example makes clear that there is considerable scope for income distribution to worsen with growth while the welfare of the poor nonetheless increases. While no one would argue that a worsening of the income distribution is a positive phenomenon, it is nevertheless encouraging to know that the poor can benefit from growth even in the presence of adverse changes in income distribution. Forgoing growth is not the answer to the problem of poverty.

Defining and Measuring Poverty

There are many indicators available for measuring poverty; in a cross country analysis the choice of indicator will be limited by the need for a consistent cross-country measure. While this study relies on income distribution data such as that described above, it is useful to review briefly the major tools used in the definition of poverty and in the conversion of national data to internationally comparable standards.

The welfare approach to poverty alleviation typically used by economists assumes both that individuals know what is best for themselves and that monetary measures of consumption or income can serve as an indicator of well-being. Using this approach, the analyst defines a poverty line as a level of income, and all those under that line are considered poor. Under an alternative non-welfarist approach, standards of nutritional or other basic human needs are defined by the observer, who then estimates the income level needed to satisfy those needs. That required level of income becomes the poverty line.

The welfare approach associates the standard of living with individual *consumption*, generally measured using *expenditure* data, and wherever possible including consumption from own production. Where expenditure data are not available, *income* can be taken as a proxy for consumption. Most of the data on poverty measures now available are based on comprehensive *household surveys.* This is the ideal form of survey, particularly if it is national in scope. One issue that arises in using household surveys to measure poverty is that the survey unit is the household, whereas we want to measure the welfare of *individuals*. If household income were the unit of analysis, then when comparing two households with equal per capita income, the larger household would wrongly appear to have higher welfare than the smaller one. Where only household information is possible, some kind of conversion to an individual (per capita) basis is necessary.[1]

A poverty line can be defined in absolute or relative terms. An ***absolute poverty line*** is set in terms of a particular living standard, defined in a common currency and held constant for all the countries, regions, or areas under consideration. One example might be setting an absolute poverty line at 20% of the U.S. median income and using this income level as the cut-off to define poverty in all countries. An alternative approach is to define poverty at a certain dollar income per day; one dollar a day is a common poverty line for developing countries. Absolute poverty levels imply a certain command over goods and services necessary to rise above poverty.

To make poverty lines comparable across countries, economists generally prefer to calculate income or expenditure on a purchasing power parity, or PPP basis. PPP takes into

---

[1] See Deaton and Muellbauer (1980) for a survey of these issues.

account the differences in relative prices, and therefore purchasing power, among different countries. One dollar typically buys more basic goods and services in India than in the United States, and that should be taken into account when estimating living standards.

A *relative poverty line* is set at a constant proportion of the mean or median income in a country, for example, 25% or 50% or even 100% of mean or median income. Each country thus has a different relative poverty line, expressed in dollars, and each country's relative poverty line changes as incomes rise. If we use 50% of median income as a relative poverty line and compare the U.S. and a developing country, clearly those with incomes equal to 50% of the median in the U.S. will have income levels higher than those at 50% of the median in a developing country like India, even after converting expenditures or income to common (PPP) dollar prices.

Once a method for defining a poverty line has been chosen, the analyst must then decide how exactly to measure those individuals below the poverty line. Three measures of poverty are commonly used[2]:

- the headcount index *(HCI)*, which measures the prevalence of poverty;
- the poverty gap index *(PGI)*, which measures the depth of poverty; and
- the Foster-Greer-Thorbecke *(FGT)* index that measures the severity of poverty.

A great deal of theoretical work has gone into defining consistent and equitable poverty measures during the last 25 years. Unfortunately, when analyzing developing countries the data are often poor enough that these measures are difficult to calculate reliably. Nevertheless, we present a brief description of the major indicators.

The *headcount index (HCI),* the proportion of the total population considered to be poor, is defined as the fraction of the population whose standard of living (income or expenditure) is below the poverty line. The headcount index is relatively easy to estimate and easy to communicate. It is quite useful in addressing overall changes in poverty. The key weakness in this measure is that it only measures changes of income that cross the poverty line and ignores shifts below the poverty line. If a poor person becomes poorer, this is not reflected in the headcount index.

The *poverty gap index (PGI)* alleviates some of this problem by measuring the aggregate amount of poverty relative to the poverty line. The poverty gap represents the transfer of income to the poor that would be necessary to eliminate poverty, assuming an absolute poverty line. The poverty gap index is simply the average poverty gap across the entire population.

---

[2]The section which follows draws heavily on work first elaborated by Foster, Greer and Thorbecke (1984), Atkinson (1987) and Foster and Shorrocks (1988). Ravallion (1992) presents a complete review of the topic.

The main weakness with the poverty gap index is that it does not indicate the severity of poverty. For example, suppose there are two countries. In Country A all of the poor all have incomes just below the poverty line. In Country B there are two groups of poor: one subgroup has incomes just below the mean and the other has much lower incomes. The poverty gap index is averaged across all the poor and could therefore mask the desperate poverty of the very poor group in the second country.

The **Foster-Greer-Thorbecke** measure is sensitive to this problem of extreme poverty. It is most commonly defined as the square of the poverty gap, divided by the population. By using the square of the poverty gap, the *FGT* gives heavier weight than the *PGI* to the poverty of the very poor, because all income gaps are squared. In the example above of two countries with the same headcount and poverty gap indices, the Foster-Greer-Thorbecke index will be higher for the second country with the group of desperately poor. The drawback to this method is that it is less straightforward to interpret. It is essentially composed of two parts: an amount due to the poverty gap and an amount due to inequality among the poor.

The choice of poverty indicator does not matter if the distribution of income has not changed within the society. When all members of society have gained income in equal proportion, then all of the measures discussed above will lead to the same poverty ranking. If instead poor individuals clustered around the poverty line gain in income, while the poorest households lose, the headcount index will register a decrease in poverty while the *FGT* index might rise. If, however, income from individuals grouped around the mean is redistributed to the poorest, the *HCI* could stay the same while the *FGT* could decline.

Table 3 below presents an illustration of a hypothetical case where income distribution **among** the poor worsens between two years, Year 1 and Year 2. Table 3 is based on the same distribution data as Table 1, but income is broken into increments of 10% (deciles). The poverty line is assumed to be $75 per year; all of the poorest 40% fall below that income.

Average income does not change from Year 1 to Year 2, but the third decile gains income share at the expense of the second decile. In this case, the head-count index of poverty remains at 40%, because the same number of people are below the poverty line. The poverty gap actually improves, from .106 to .0933. But the FGT index of extreme poverty gives greater weight than the other measures to the decline in income of the second-poorest decile, and rises from .0373 to .0435.

Table 3:   How Poverty Indexes Reflect Gain of Some Poor at Expense of Others

	Distribution in Year 1			Distribution in Year 2		
Decile	Average income ($)	Frequency (% share)	Cumulative (% share)	Average income ($)	Frequency (% share)	Cumulative (% share)
1	40	.04	.04	40	.04	.04
2	*50*	*.05*	*.09*	*40*	*.04*	*.08*
3	*60*	*.06*	*.15*	*70*	*.07*	*.15*

4	70	.07	.22	70	.07	.22
5	80	.08	.30	80	.08	.30
6	90	.09	.39	90	.09	.39
7	100	.10	.49	100	.10	.49
8	120	.12	.61	120	.12	.61
9	180	.18	.79	180	.18	.79
10	210	.21	1.00	210	.21	1.00
Gini index			.284			.286
Head count index			.400			.400
Poverty gap index			*.1067*			*.0933*
FGT index			*.0373*			*.0456*

The data presented in Table 3 highlight the importance of changes in income distribution among the poor. Unfortunately, data at this level of disaggregation are rarely available for a broad enough cross-section of countries for empirical analysis.

This section has presented analytic evidence to show that economic growth has great potential for poverty reduction because income distributions tend to change relatively slowly over time. Even when income distributions worsen, there is still a great deal of room for economic growth to raise the incomes of the poor and increase their welfare. The section below provides empirical evidence that in most cases, economic growth does promote poverty reduction.

III.   EMPIRICAL EVIDENCE ON GROWTH AND POVERTY REDUCTION

The early hypothesis of the Kuznets curve led to a large development literature on the potential for economic growth to widen inequality and worsen the plight of the poor, a phenomenon called *immiserizing growth*[3]. The initial studies on the Kuznets curve hypothesis used cross-sectional data and compared poor countries to rich countries in order to test hypotheses about income distribution and growth. As data covering longer time periods for individual countries have become available, the evidence points in the opposite direction: growth appears to lessen poverty.

---

[3]Robinson (1976), Adelman and Robinson (1989), Papanek and Kyn (1981)

Even early studies[4] found that increases in poverty and economic growth were a very exceptional combination. A 1979 study of 12 growth periods in various countries found no increase in poverty and the real per capita income of the poorest 20% rose in every period of growth. A more recent study by Fields (1989) indicates that of 18 countries with data on poverty over time, in only one case was economic growth not accompanied by a fall in poverty. Moreover, Fields found that more rapid economic growth tends to bring greater declines in poverty.

While this preliminary evidence was encouraging, more conclusive results were precluded by the lack of data. In 1996, however, a new database was compiled by Klaus Deininger and Lyn Squire at the World Bank. This database contains the most comprehensive data that exist on income distribution across countries. The data cover 58 countries, beginning in 1960, and for each country give the distribution of income by quintile. In compiling the database, every effort was made to ensure that only reasonably high quality data based on comprehensive household surveys were included. Of the 58 countries included in the database, 26 are developing countries. The database makes it possible for the first time to test propositions about the Kuznets curve and the relationship between growth and poverty over time.

We used the Deininger-Squire data set to identify 61 intervals, covering 26 developing countries,[5] for which growth in national average and quintile incomes could be identified. We used relatively restrictive criteria in defining our sample: intervals should be at least 5 years in length, but as long as a decade if possible, and based on consistently defined household surveys.

Our aim in this study was to measure the growth of average income for both the poorest 20% and the poorest 40% of the population, then to compare these to the growth of GDP per capita. For example, to calculate the growth in income for the poorest 20% of the population we took the share of income held by the poorest 20% and used the level of GDP for each year to calculate the dollar amount of income held by the poor.[6] The GDP figures were taken from the Summers and Heston Penn World Tables, which calculates a cross-nationally comparable GDP, adjusted for differences in purchasing power in different countries.[7] The data and the calculations used to derive them are given in Appendix A.

---

[4]Ahluwalia, Carter and Chenery (1979) and Fields (1980)

[5] The countries (and number of intervals) are Bangladesh (4), Brazil (3), Chile (1), China (2), Colombia (2), Costa Rica (3), Dominican Republic (1), Greece (2), Hong Kong (4), India (4), Indonesia (2), Jamaica (1), Jordan (1), South Korea (4), Malaysia (3), Mexico (3), Morocco (1), Nigeria (1), Pakistan (3), Panama (1), Philippines (1), Sri Lanka (2), Taiwan (3), Thailand (3), Trinidad and Tobago (2) and Venezuela (2).

[6]The formula used to derive income of the various quintiles is as follows: The income share of the bottom 20% is the income that the group actually holds in a given year divided by total national income. The average income per capita of the poorest 20% is therefore the income share of the bottom 20%, divided by their share in the population (20%) times the average per capita income. Details are givenin Appendix A.

[7]These figures are adjusted for "purchasing power parity" as described above, to compensate for the different purchasing power of a dollar across countries.

From these calculations, we regressed the growth of income for the poorest two groups against the growth of GDP per capita for the entire population. The results are summarized in Table 4 and in Figures 3 and 4 below. Larger versions of these figures are given in Appendix B.

Table 4: Response of Average Income of Lower Income Groups to Growth of GDP Per Capita, 1960 to 1993[8]

	Poorest 20%	Poorest 40%
Change (%) in average income with a 10% increase in GNP per capita	.921	1.008
t-ratio	5.829	8.4526
Adjusted R^2	0.3563	0.5486

The regressions reported in Table 4 show that an increase in the rate of per capita GDP growth translates into a one-for-one increase in average income of the poorest 40%. GDP growth of 10% per year is associated with income growth of 10% for the poorest 40% of the population. For the poorest 20% the elasticity of response is 0.921; GDP growth of 10% is associated with income growth of 9.21%. These regressions indicate that on average the poor do benefit from economic growth.

Figure 3 shows the data for the poorest 20% of the population and indicates that there is a clear relationship between growth of the incomes of the bottom 20% and growth in GDP per capita. All the data points in the upper right quadrant are examples of periods where economic growth increased the incomes of the poorest 20%. The cases where increases in per capita GDP were accompanied by decreases in the income of the bottom 20%, are located in the bottom right quadrant and are discussed below.

---

[8]These regressions included initial levels of GDP. The coefficients on GDP (i.e. the responsiveness of changes in the income of the poor to GDP growth) barely changed when initial GDP was excluded from the regression. The coefficients on initial levels of GDP are small, positive, and not significant, indicating that for this sample, the starting level of GDP had no effect on income growth of the poor.

Figure 3

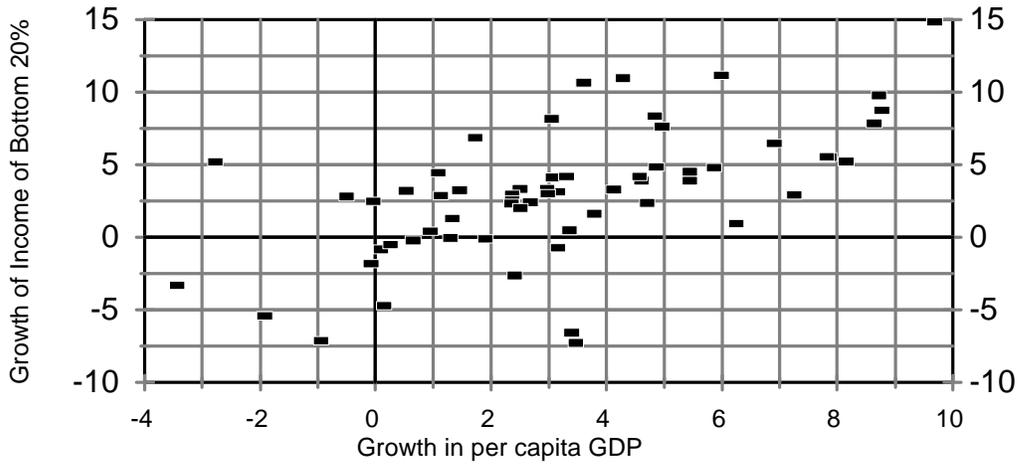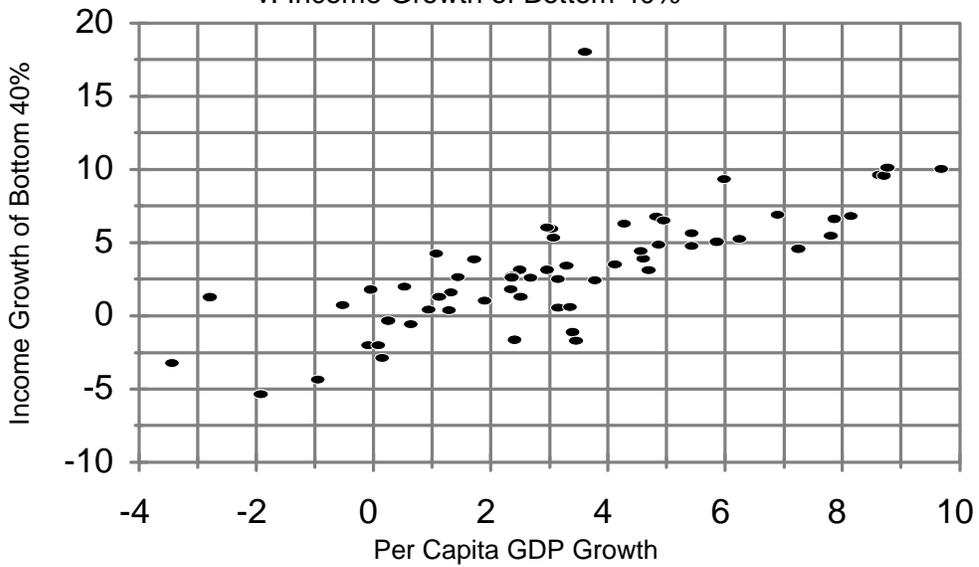GDP Growth v. Inc. Growth: Bottom 20%

Figure 4 shows a similar story for the incomes of the bottom 40%, which are associated even more strongly with an increase in per capita GDP.

Figure 4 - Growth in Per Capita GDP
v. Income Growth of Bottom 40%

In the vast majority of cases, economic growth is accompanied by a reduction of poverty, as indicated by the large number of observations in the upper right hand quadrant of the graph.

The combination of substantial growth in per capita GDP and a significant decline in income for the poorest 20% or 40% (observed in the lower right hand quadrant of the graph) occurred in only five out of twenty-six countries: China (1986-1992), Colombia (1970-8), Costa Rica (1971-77 and 1983-89), the Dominican Republic (1984-89), and Greece (1981-88). And only in the three Latin American countries did this occur for both the poorest 20% and 40%.

In addition to the few adverse observations, however, there are a number of cases in which rapid growth, while not reducing incomes of the poorest, did not raise them much, either. This weak response is observed for the poorest 20% of Hong Kong (1986-91), Korea (1970-76) and Sri Lanka (1973-81 and to a lesser extent 1981-87). The first two cases are curious, because Hong Kong and Korea both experienced rapid growth in several other periods when the poorest 20% did extremely well. For the long period of rapid growth in Hong Kong and Korea, as in other East Asian countries that followed outward-looking strategies, there appears to have been substantial reductions in poverty. The Sri Lanka case is a concern, however, because it coincides with the period when economic liberalization replaced a regime that was notable for protecting the incomes of the poor.

Finally, in four cases, very poor (but not negative) economic growth led to a deterioration in the share of income held by the poor: Chile (1971-89), Mexico (1984-1989), and Nigeria (1986-1992), and Pakistan (1970-1979). In all these cases economic growth per person was less than 0.3% per year.

Of the eight episodes noted above in which incomes of the poorest either reacted adversely to growth or did not respond much, four involve data from the 1970s that may be of questionable quality and comparability. The distribution data from Deininger and Squire on which our analysis is based cover 30 years, a span that is appropriate to deal with questions about growth and poverty. Over that time the resources devoted to household surveys have increased and the standards for acceptable data have been refined and improved. Hence for any country the early data are unlikely to be comparable to more recent surveys and may give spurious results.

These results give strong support to the proposition that GDP growth can be and usually is a powerful force in reducing poverty, whether our concern is with the poorest 20% or 40% of the population. Of the thirty-nine intervals where GDP growth exceeded 2% per capita, the income of the poor fell in only six. And only Chile and Costa Rica experienced declines in income of both the poorest 20% and 40% over the last three decades in combination with economic growth.

Economic Growth and Income Distribution

The data above demonstrate that the poor benefit from economic growth through rising incomes. Even when the income distribution deteriorated with growth, the poor still had rising incomes in almost all cases. Figures 3 and 4 above show graphically the changes in the share of income accruing to the bottom 20% and 40%. If a 45° line from the origin is drawn on the graph, as it is in Appendix B, any points above that line represent improvements in the income share of the poor. In Figure 4, showing the poorest 40%, the poor improved their share of total income in more than half the growth episodes. For the poorest 20% shown in Figure 3, the poor overwhelmingly increased their average income, even though in more than half the episodes the poor lost income share.

As discussed above, income distributions tend to change quite slowly over time. Because of this, growth has great potential to raise the incomes of the poor. As noted above, in Thailand, which had the greatest deterioration in income distribution over the last 30 years, the per capita income of the poorest quintile was 60% higher in 1992 than in 1975, while the incomes of the poorest 40% nearly doubled. Growth is a powerful mechanism for reducing poverty.

Additional Evidence that Growth Reduces Poverty

Using the same data set but including all 58 countries, Deininger and Squire (1996b) identify 91 intervals or episodes for which income growth and changes in income distribution are available. They find that changes in income distribution are generally small, so that growth is clearly associated with increasing incomes in each quintile of the population. In more than 81% of their 91 growth episodes, the incomes of the poorest quintile rose.

Another study by Ravallion and Chen (1996) analyzes a more selective set of household survey results, covering the period since 1980. Their results are striking and give strong support to the hypothesis that growth reduces poverty in developing countries.

Ravallion and Chen use 64 intervals that cover periods from one to seven years. Twenty-one of these intervals are from Eastern Europe and Central Asia (former Soviet or transitional countries), and forty-three are from developing countries. For each episode, Ravallion and Chen calculate the change in the headcount index of poverty (H) and the growth in the mean income for the sample as a whole.

Regressions of the change in poverty *versus* the growth in average sample income are reported in Table 5 for two poverty lines[9]: 75% of the sample mean income in the first survey year for each country and a lower line of $1 dollar per day. The results are given separately for the former Soviet countries and the developing countries. With the 75% of mean income poverty

---

[9]The original study ran these regressions with four poverty lines: 50% of mean income, 75% of mean income, 100% of mean income, and the dollar a day poverty line. The 75% of mean income results are reported here as the crucial poverty line for developing countries.

line, a 10% growth in income has a proportional impact on poverty, reducing the number living below the poverty line by 9.9%. The impact of growth on the welfare of the very poor was even greater: with the poverty line defined as the international standard of only $1 per day, then a 10% rise in average income reduced poverty by 17.6% for this sample. For transitional economies, which are undergoing deep structural change and for which incomes fell in many episodes, the elasticities are still higher: with the poverty line at 75% of the mean, a 10% rise income reduces poverty by 26.6%. All these estimates, derived from simple regressions, are highly significant, as indicated by the *t*-ratios.

Table 5:	Response of Headcount Index (H) of Poverty to Growth in Mean Income (Y), 1980 to 1993				
	Developing countries			Transitional economies	
Poverty line as	Change (%) in H with 10% growth in Y	*t*-ratio		Change (%) in H with 10% growth in Y	*t*-ratio
75 % of Y	*- 9.9*	- 12.22		*- 26.6*	- 8.99
$1 per day	*- 17.9*	- 4.92			
Source: Ravallion and Chen (1996)					

Bruno, Ravallion and Squire (1996), using the same data set,[10] find that for twenty poor countries, the Foster-Greer-Thorbecke (FGT) measure of the severity of poverty is even more responsive to growth: a 10% rise in average income is associated with a 35% fall in the FGT index. Because the FGT index gives greater weight than the headcount index to the incomes of the those well below the poverty line, this result demonstrates that economic growth does reach the very poor.

Regional Data

The data sets described above contain very little data on Africa, where there has been intense concern about the adverse effect of growth-oriented strategies on poverty. A recent study by Demery and Squire (1996) assemble survey data for six African countries: Cote d'Ivoire (1985-88), Ethiopia (1989-94), Ghana (1988-92), Kenya (1982-92), Nigeria (1985-92) and Tanzania (1983-91). They show that over these intervals, the headcount index of poverty rose only in Cote d'Ivoire where per capita income declined by 2.5% a year. The index of poverty fell substantially in Ethiopia, Nigeria, and Tanzania, and fell slightly in Ghana and Kenya. Surprisingly, incomes also declined (by 2.3% a year) in Ethiopia over the relevant period when poverty did not increase nearly as much. Ghana and Nigeria had per capita growth rates of about

_____

[10] The data set is undergoing continual refinement, so it is possible that the data used in Ravallion and Chen are not identical to that used in the slightly earlier work of Bruno, *et al.*

1% per annum over the relevant periods according to their calculations, while Tanzania and Kenya had growth rates of 0.4%. When the poverty line is drawn to include only the poorest 10% of the population in the initial survey year, however, poverty increased in four of the five countries for which there are estimates. This is not surprising, given that per capita growth rates were less than one percent a year. For three of these countries, Kenya, Tanzania, and Nigeria, the data quality is rated as "medium" or "poor," and it is notoriously difficult to reliably estimate income or expenditure of the very poor.

Latin America is another region that elicits concern about the impact of growth on poverty. We include eight Latin American countries in our data, representing 15 of the 61 intervals in our sample. Only five of these intervals--from Colombia, Costa Rica, Chile, and the Dominican Republic--show results contrary to the general finding that growth reduces poverty. Morley (1995), using essentially the same data set, has analyzed changes in income distribution during the 1980s and early 1990s. His findings are consistent with ours. During periods of recovery, distributions improved and poverty was reduced, while during periods of recession, income distribution worsened and poverty increased. There were two exceptions to this pattern: Guatemala in 1986-9 and Chile in 1987-90.

Thus the preponderance of evidence, over both long and short intervals, demonstrates that economic growth reduces poverty. Not only is the tendency strong, but there very few exceptions. These results suggest that for the vast majority of countries the fear that growth will bypass the poor is misplaced.

IV. POVERTY, ECONOMIC POLICY AND ECONOMIC STRUCTURE

The evidence that growth substantially reduces poverty does not rule out the possibility that different growth-oriented policies could have different impacts on the rate of poverty reduction. A companion CAER study by Stryker, et al., will look at these issues in detail. Our purpose here is to bridge these two studies by reviewing some results arising from our own preliminary analysis and from additional studies done in this area.

The association of economic growth with poverty reduction leads to the expectation that policies promoting growth will also reduce poverty. Critics of stabilization and structural adjustment policies have taken the opposite view, that these exacerbate poverty. But to the extent that structural adjustment and stabilization promote sound macroeconomic management and an openness to trade, they should work to reduce poverty through economic growth. And indeed there is a large and growing body of literature showing that open economies tend to grow faster than closed economies.

If open, market-oriented policies and sound macroeconomic management lead to growth and growth reduces poverty, then it ought to be possible to observe the impact of policies on

poverty directly.   We used our calculations of income growth for the poorest 20% and 40%, based on the Deininger-Squire data, to test the hypothesis that outward-looking policies benefit the poor.

To measure outward orientation, we use a dummy variable developed by Sachs and Warner (1995a) that incorporates observations of the parallel market exchange rate premium, quantitative import restrictions, the number of export restrictions (namely marketing boards for agricultural exports in Africa), and socialist (rather than market-oriented) economic management. To qualify as open, a country must have a low score on all four criteria. The openness variable below represents the fraction of years during a growth episode in which a country could be considered open. We ran two sets of regressions: the first looks at the effects of openness on growth of incomes of the poor (regressions 1 and 2 below), while the second tries to distinguish between the effects of growth and the effects of openness on the incomes of the poor (regressions 3 and 4 below). Table 6 summarizes the results.

Table 6:	Regression for Growth of Incomes of Poorest 20% and 40% on GDP Growth and Openness[a]				
Regr'n number	Dependent variable= Income growth of bottom 20/40%	Constant	Growth of GDP p.c.[11]	Openness	Adjusted R-squared
1	inc_{20}	2.047 (2.584)		2.405** (1.991)	.0478
2	inc_{40}	2.437 (3.337)		1.926* (1.73)	.0326
3	inc_{20}	-0.2787 (-0.303)	**.864** (5.027)	.0557 (.048)	.3213
4	inc_{40}	-0.5529 (-0.795)	**1.038** (7.984)	-1.055 (-1.19)	.5359

[a] *t*-ratios in parentheses; coefficients in boldface are significant at 1% level or better. ** indicates significance at the 5% level, * at the 10% level.

The first two regressions, in which growth of average income is regressed on the openness dummy alone, suggest that open economies do favor more rapid growth in the incomes of the poorest 20% and 40% of the population and the effect is substantial. However, openness explains less than 5% of the variance of income growth in these regressions. And the effect disappears when the regressions are run with both GDP growth and the openness dummy. In regressions 3 and 4, the growth of GDP has the high and highly significant coefficients previously noted, while the coefficient on openness, though still positive, is smaller and statistically insignificant (i.e.

---

[11]In regressions 3 and 4 the initial level of GDP is also included to control for differences in starting levels of income. The coefficient is positive, but very small and not significant.

indistinguishable from zero). These regressions argue that more open economies do deliver more rapid growth to the poorest, but that the impact works primarily through economic growth: openness contributes to more rapid growth of GDP which in turn reduces poverty.

Additional Evidence on Economic Policies, Growth and Poverty

A great deal of evidence has been generated in the last five years that supports the proposition that more open economies have higher rates of growth. This section reviews the main findings of these studies.

An important study by Dollar (1992) looks at the relationship between exchange rates and growth by constructing a measure of openness indicating the extent to which the trade regime distorts the real exchange rate from its free-trade level for the period 1976-1985 and uses this indicator in a regression of 95 countries. Dollar estimates that reducing the level of exchange rate distortion to that of Asia would raise GDP growth by 1.8% in Africa and 0.7% in Latin America. Reducing exchange rate variability to the Asian level would add an additional 0.8% to annual growth in Latin America and 0.3% to growth rates Africa.

 Sachs and Warner test the effects of openness on growth using their openness variable described above. In regressions of the annual growth of per capita GDP from 1970 to 1989, incorporating data for 114 countries, Sachs and Warner find large, negative and highly significant coefficients for the openness variable. Open economies have annual growth rates as much as 2.8 percentage points higher than closed economies, on average.

Sachs (1996) has used these results to show how much faster African countries could grow if they adopt the kind of open policies that have characterized East and Southeast Asian countries. He attributes a difference of 1.8% a year in income growth to the closed-economy policies of African countries, including exchange rate overvaluation, import restrictions and export restrictions (marketing boards). Two other factors--lower savings rates[12] and less efficient internal markets--reduce growth rates by another 2.8% a year below Asian levels, so that on the whole different policies can explain 4.6% of the difference between African and Asian growth rates.

Using a different regression framework, Easterly and Levine (1996) find that three variables associated with soundly managed, open economies--the exchange rate premium, the fiscal surplus as a share of GDP, and ratio of liquid financial assets to GDP--can account for a growth differential of 1.5 percentage points between African economies and East and Southeast Asian economies.

---

[12] Lower savings rates are not a policy variable. However, government deficits, which are susceptible to fiscal policy, are an important contributor to low savings in Africa.

These studies focus on the relationship between growth and economic structure. A study by Fischer (1993) investigates the effects of shorter-term, macroeconomic variables with long-term growth. Fischer finds that low budget deficits (or higher surpluses), low inflation and market-based official exchange rates[13] are associated strongly and significantly with more rapid economic growth. By extension, then, sound macroeconomic management, because it establishes conditions for sustainable growth, is associated with reduced poverty.

Finally, in their study of six African countries cited above, Demery and Squire (1996) construct an index that measures the combined effects of three macroeconomic policies: a reduction in the fiscal deficit, a reduction in seignorage, and a devaluation of the real effective exchange rate. They find that in all six countries, a favorable change in the macroeconomic policy index was associated with a favorable change in the incidence of poverty. In Cote d'Ivoire, the only country with increased poverty, the macroeconomic index worsened.

These studies all demonstrate the important connection between outward oriented policies and economic growth. Because economic growth is such a key factor in poverty reduction, openness becomes an important policy variable that can be used to reduce poverty. But economic structure and government spending decisions also matter, as discussed below.

Poverty and Economic Structure

Countries that are relatively rich in natural resources tend to have slower economic growth. Furthermore, for reasons already discussed, in resource-rich societies the distribution of income is expected to be more concentrated and market forces alone will be less effective in translating GDP growth into substantial reductions in poverty. Thus, on both counts, we would expect the growth of income of the poorest groups to be slower in resource-rich economies. To test this proposition, we utilized three indices compiled by Sachs and Warner to represent resource endowment:

- the ratio of natural resource exports to GDP
- the ratio of natural resource exports to total exports
- the ratio of arable, pasture, and forest land to population.

All indices are based in 1971, a year predating all but a few of our observations and thus indicative of an initial resource endowment.

---

[13] As indicated by low premia on the informal market.

The results are qualitatively similar to those on openness. Resource exports as a share of total exports and land per person have a negative effect on growth. The coefficients are negative and significant at the 1% level or better.[14] Growth of incomes for the poor is lower in well-endowed economies. But resource endowment does not explain much of the variance in income growth of the poor: adjusted R-squareds are below 25%. And, as with openness, when the growth of GDP is inserted into these regressions, the resource endowment coefficients lose significance, though they retain the expected negative sign. Resource endowments appear to work against poverty reduction through their depressing effect on economic growth, as Sachs and Warner (1995b) have demonstrated.

Table 7 below shows the role of policy in overcoming resource wealth problems. Regressions were run showing the effects of openness and resource endowment on income growth of the poor. Regressions 1 and 2 use the share of resource exports in total exports as the indicator of natural resource wealth. All coefficients are negative and all but one are significant at the 5% level or better. This indicates that high levels of resource exports are associated with lower growth rates. The openness variables are positive; the positive impact of an open economy can offset the negative impact of resource dependence.

In regressions 3 and 4, land is used as the indicator of resource wealth, and the story is broadly similar, though only one of the coefficients on openness is significant at the 5% level. Resource wealth in terms of land appear to have a negative affect on growth. None of these regressions, however, explains more than a third of the variance in income growth of the poorest.

When the growth of GDP per capita is included, the openness and resource endowment variables lose their significance, although the signs remain the same. Openness retains its positive sign, suggesting again an open economy may help to offset the negative impact of resource dependence. As in the regressions above, the openness and resource variables appear to have little or no impact on poverty that is separable from their impact on economic growth.

---

[14] The other indicator, resource exports as a share of GDP, gives negative but insignificant coefficients. If natural resource exports have a negative effect on growth of the economy as a whole, then using resource exports as a share of GDP should give significant results. If resource exports as a share of total exports negatively affects growth, then a different mechanism underlies the relationship between resource exports and growth.   A large share of resource exports may give greater opportunities for rents and corruption, and this may have a negative effect on growth. In addition, resource exports may have a Dutch disease affect, appreciating the real exchange rate and thereby slowing growth.

Table 7: Regressions of Growth of the Incomes of the Poorest 20 and 40% on GDP Growth, Openness and Natural Resource Endowment[a,b]

Regr'n number	Depend. Variable=Income growth of poor	Constant	Openness	Resource exports[c]	Land per person	Adjusted R^2
1	inc_{20}	1.93 (2.194)	**3.222** (2.846)	-8.3099 (-1.371)		.1244
2	inc_{40}	1.988 (2.998)	**3.311** (3.881)	**-9.304** (-2.307)		.2349
3	inc_{20}	.9603 (1.268)	1.843 (1.487)		**-.74932** (-2.280)	.1752
4	inc_{40}	.9588 (1.694)	**1.971** (2.128)		**-.7229** (-2.94)	.2919

[a] *t*-ratios in parentheses; coefficients in boldface are significant at 5% level or better.
[b] Regressions run without data from Trinidad & Tobago, which have unusually high natural resource exports and high levels of growth of the bottom 20 and 40%.
[c] Natural resource exports as share of total exports.

In considering the curse of resource wealth on poverty reduction, it is important to keep in mind a few outliers: resource-rich countries that have enjoyed both rapid GDP growth and dramatic reductions in poverty. Indonesia and Malaysia, both rich in natural resources including petroleum, have had rapid growth in GDP per capita since 1970 and substantially reduced poverty. In Indonesia, for example, average incomes grew by 4% a year from 1970 to 1993 and the headcount index of poverty fell from 60% to under 15%. In Malaysia, per capita income grew by over 3% a year and the headcount index of poverty fell from 18% to 2% over the same period. These countries avoided the curse of wealth through shrewd government policies.

First, both governments maintained sound macroeconomic policies that avoided exchange rate overvaluation and other symptoms of Dutch disease during the resource booms of the 1970s. Second, they invested in the education and health of their people, especially of the rural poor. Third, Indonesia (and to a lesser extent Malaysia) invested in rural infrastructure and agricultural development that benefited agricultural smallholders, especially on densely populated Java. And fourth, Malaysia undertook a determined policy of redistribution of assets and jobs towards the majority Malay population, which included most of the poor. Resource wealth does not condemn a country to entrenched poverty. Instead, resource wealth can be turned to an advantage in the war on poverty, but it takes a determined and skillful government to do so. It is the political economy of resources that drives the growth and poverty results.

Additional Evidence on Poverty and Economic Structure

Additional, intriguing evidence on poverty and economic structure is provided by Deininger and Squire (1996c), who utilize their data set to investigate the impact of both

economic structure and economic strategies on the incidence of poverty. Deininger and Squire are interested in the question of whether income growth--for the society as a whole and for the poor as a group--is more affected by initial levels of inequality or by levels of investment. They find that initial income inequality is not a robust determinant of future growth. Initial inequality is far from sufficient to explain the large differences in growth rates across countries. In their sample, a difference in the initial Gini coefficient of one standard deviation (9 points) is associated with a difference in growth rates of 0.4%.   In addition, they find:

- **Higher investment rates have a positive and statistically significant impact on income for all quintiles of the income distribution.**
  Notably, the impact is higher for the bottom 20% than for any other group: a one-standard-deviation (9.4%) increase in the investment [rate] is associated with income gains of 1.8% a year for the poorest 20% of the population, compared to 1.5% for the population as a whole. For the bottom 40% as a group, however, the gain is 1.2% a year.

- **The initial distribution of land, as measured by the Gini coefficient, also has an impact on future income growth.**
  Again, the impact is greatest for the poorest. A one-standard-deviation decline in the initial Gini coefficient for land is associated with gains in income of 1% a year for the poorest 20% of the population and 0.9% a year for the poorest 40%, compared to 0.5% a year for the population as a whole.

- **The initial distribution of income has no statistically significant impact on the incomes of the poorest 20 and 40% apart from that caused by lower growth rates.**
  The initial distribution of income does affect average income growth, as faster growth is associated with greater initial equality. This results is confirmed by other recent studies, but this work indicates that greater initial inequality may not have a harmful effect on the poor in addition to that caused by lower growth.

These results imply that gains in investment rates may have a more powerful impact on poverty than changes in the distribution of land. Thus if land redistribution is likely to reduce investment rates because of political turmoil, for example, depending on the trade-off the poor may be better served if government forgoes land redistribution and implements policies to raise investment. Given the difficulties involved in redistributing both land and income, it seems quite possible that raising investment rates will be a better mechanism for poverty reduction that redistribution.

CONCLUSION

This study demonstrates that economic growth benefits the poor in almost all the countries in which substantial growth has taken place. Indeed, economic growth appears to be one of the

best ways to reduce poverty. The poor do better in countries that grow quickly, even if income distribution deteriorates slightly. Countries which experienced rapid economic growth over the last thirty years, such as Hong Kong, Korea, Malaysia, and Indonesia, saw the per capita incomes of the bottom 20% and 40% of the population grow significantly. Another conclusion of this study is that income distribution changes only very slowly, and that a policy that aims at redistributing income at the expense of economic growth may have very low payoffs in terms of poverty reduction. While the evidence suggests that countries with more equal income distributions grow more quickly, the evidence also indicates that economic policy can compensate for inferior initial income distributions.

This study indicates that more outwardly oriented countries grow more quickly, leading to greater poverty alleviation. While it is quite difficult statistically to separate the effects of poverty on openness from those of economic growth, the evidence presented here suggests that the poor fare better in open economies. As noted above, this effect does depend on economic structure, and in those countries with more resource-intensive economies where wealth can be more concentrated, governments will have to make a determined effort to distribute the benefits of growth more widely, and should have the resources to do so.

Thus there is every reason to believe that economic growth reduces poverty. There is little evidence to support the contention that economic growth and outward-oriented policies will hurt the poor. Countries with higher rates of economic growth over the last 30 years have achieved greater reductions in poverty.

BIBLIOGRAPHY

Adelman, Irma and Sherman Robinson, 1989. "Income Distribution and Development." In Chenery and Srinivasan, eds. Handbook of Development Economics, Vol 2. Amsterdam: New Holland.

Ahluwalia, M., N.G. Carter, and Hollis B. Chenery, 1979. "Growth and Poverty in Developing Countries." Journal of Development Economics. 3:307-342.

Atkinson, Anthony B., 1991. "Comparing Poverty Rates Internationally: Lessons from Recent Studies in Developed Countries." World Bank Economic Review 5-1: 3-21.

Atkinson, Anthony B 1987. "On the Measurement of Poverty." Econometrica 55-4: 749-764.

Atkinson, Anthony, 1975. The Economics of Inequality. Oxford: Oxford University Press.

Anand, S. and Harris, C. (1992). "Issues in the Measurement of Undernutrition" in S. Osmani, ed. Nutrition and Poverty. Oxford: Oxford University Press.

Bennell, Paul, 1996. "Rates of Return to Education: Does the Conventional Pattern Prevail in Sub-Saharan Africa," World Development. 23-1: 183-199.

Blackburn, McKinley, 1994. "International Comparisons of Poverty." The American Economic Review. 84-2:371-374.

Bourguignon, Francois, Jaime de Melo and Christian Morrisson, 1991. "Poverty and Income Distribution during Adjustment: Issues and Evidence from the OECD Project." World Bank Country Economics Department, Working Paper 810.

Bourgignon, Francois and Christian Morrison,1990. "Income Distribution, Development and Foreign Trade: A Cross-Sectional Analysis." European Economic Review, Vol 34: 1113-1132.

Bruno, Michael, Martin Ravallion, and Lyn Squire, 1996. "Equity and Growth in Developing Countries: Old and New Perspectives on the Policy Issues." World Bank, Policy Research Working Paper 1563.

Chauduri, S. and Martin Ravallion, 1994. "How Well do Static Welfare Indicators I dentify the Chronically Poor?" Journal of Public Economics, 53-3: 367-394.

Deaton, Angus, and J. Muellbauer, 1980. Economics and Consumer Behavior. Cambridge: Cambridge University Press.

Deininger, Klaus and Squire, Lyn, 1996a. "Does Inequality Matter? Re-examing the Links between Growth and Equity." Mimeo.

Deininger, Klaus and Lyn Squire, 1996b. "Measuring Income Inequality: A New Data-Base." Mimeo.

Deininger Klaus and Squire, Lyn, 1996c. "New Ways of Looking at Old Issues: Inequality and Growth," Mimeo.

Demery, Lionel, and Lyn Squire, 1996. "Macroeconomic Adjustment and Poverty in Africa: An Emerging Picture." World Bank Research Observer 11-1: 39-59.

Dollar, David, 1992. "Outward Oriented Economies Really Do Grow More Rapidly: Evidence from 95 LDCs, 1976-1985." Economic Development and Cultural Change 40: 523-44.

Easterly, William, and Ross Levine, 1996. "Africa's Growth Tragedy: Policies and Ethnic Divisions." Harvard Institute for International Development, Development Discussion Paper 536.

Fields, Gary, 1989.. "Changes in Poverty and Inequality in Developing Countries" The World Bank Research Observer, 4-2: 167-182.

Fields, Gary, 1980. Poverty, Inequality, and Development. Cambridge: Cambridge University Press.

Fields, Gary and George H. Jakubson, 1993. "New Evidence on the Kuznets Curve." Cornell University, Mimeo.

Fischer, Stanley, 1993. "The Role of Macroeconomic Factors in Growth." Journal of Monetary Economics 32: 485-512.

Foster, J., J. Greer and E. Thorbecke, 1984. "A Class of Decomposable Poverty Measures." Econometrica 52-3: 761-766.

Foster, James, 1994. "Normative Measurement: Is Theory Relevant" The American Economic Review. 84-2: 365-370.

Foster, James and Anthony Shorrocks, 1988. "Poverty Orderings." Econometrica 56-1: 173-177.

Greer, J. And Thorbecke, E., 1986. A Method for Modeling Food Poverty Applied to Kenya."
Journal of Development Economics 24:59-74.

Haddad, L. and Ravi Kanbur, 1990. "How Serious is the Neglect of Intra-household Inequality?"
Economic Journal 100: 866-881.

Kakawani, Nanak, 1980. "On a Class of Poverty Measures." Econometrica 48-2: 437-446.

Lipton, Michael, and Martin Ravallion,1995. "Poverty and Policy," in Jere Behrman and T.N.
Srinivasan, eds, Handbook of Development Economics, Volume III. Amsterdam: Elsevier
Science.

Morley, Samuel, 1995. Poverty and Inequality in Latin America: The Impact of Adjustment and
Recovery in the 1980's. Baltimore: Johns Hopkins University Press.

Papanek, Gustav, and Oldrich Kyn, 1986. "The Effect of Income Distribution on Development,
the Growth Rate, and Economic Strategy." Journal of Development Economics 23:55-65.

Pritchett, Lant, 1996. "Where has all the Education Gone?" World Bank Policy Research
Working Paper 1581.

Psacharopoulos, George 1994. "Returns to Investment in Education: A Global Update," World
Development 22-9: 1325-1343.

Psacharopolous, George, 1988. "Education and Development: A Review." World Bank
Research Observer. 3-1.

Ravallion, Martin, 1992. "Poverty Comparisons: A Guide to Concepts and Methods." World
Bank LSMS Working Paper 88.

Ravallion, Martin, and Shaohua Chen, 1996. "What Can New Survey Data Tell us About Recent
Changes in Living Standards in Developing and Transitional Economies." Mimeo,
Poverty and Human Resources Division, Policy Research Department, World Bank.

Ravallion, Martin, and Gaurav Datt, 1996 "How Important to India's Poor is the Urban-Rural
Composition of Growth?" World Bank Economic Review 10-1.

Ravallion, Martin, and Monika Huppi, 1991. "Measuring Changes in Poverty: A Methodological
Case Study of Indonesia during an Adjustment Period." World Bank Economic Review
5-1: 57-82.

Reutlinger, S. And Selowsky, M., 1976. Malnutrition and Poverty. Magnitude and Policy

Options. Baltimore: Johns Hopkins University Press for the World Bank.

Robinson, Sherman, 1986. "A Note on the U-hypothesis Relating Income Inequality and Economic Development." American Economic Review 66: 437-440..

Sachs, Jeffrey, 1996. "Growth in Africa: It Can be Done." The Economist, June 29: 19-21.

Sachs, Jeffrey and Andrew Warner, 1995a. "Economic Convergence and Economic Policies." Harvard Institute for International Development, Development Discussion Paper 502.

Sachs, Jeffrey and Andrew Warner, 1995b. "Natural Resource Abundance and Economic Growth." Harvard Institute for International Development, Development Discussion Paper 517a.

Sen, Amartya, 1979. "Personal Utilities and Public Judgements: Or What's Wrong with Welfare Economics?". The Economic Journal. 89: 537-558.

Sen, Amartya, 1976. "Poverty: An Ordinal Approach to Measurement." Econometrica 44-2: 219-232.

Squire, Lyn,1993. "Fighting Poverty" American Economic Review. 83-2: 377-382.

The World Bank,1990.World Development Report 1990, London: Oxford University Press.

APPENDIX A

Data: Shares Of Income, Income Growth Rates, And GDP Growth Rates

Country	year	Inc share-poorest 20%	Inc share poorest 40%	Per capita GDP - 1985 US $	Inc growth - Poorest 20%	Inc growth - Poorest 40%	Growth in per capita GDP
Bangladesh	1963	0.069	0.179	1072			
Bangladesh	1973	0.07	0.183	756	-3.29307	-3.218465	-3.432119
Bangladesh	1981	0.0664	0.1736	1084	3.919534	3.920389	4.607647
Bangladesh	1986	0.0699	0.1935	1261	4.135541	5.332747	3.071159
Bangladesh	1992	0.0935	0.2286	1510	8.168147	5.952088	3.048967
Brazil	1960	0.032	0.101	1784			
Brazil	1970	0.032	0.095	2434	3.155545	2.525712	3.155544
Brazil	1980	0.029	0.088	4303	4.826208	5.056029	5.863214
Brazil	1989	0.0248	0.074	4271	-1.804811	-1.98815	-0.082904
Chile	1971	0.043	0.131	3881			
Chile	1989	0.037	0.105	4361	-0.186901	-0.579583	0.6499282
China	1980	0.0793	0.202	972			
China	1986	0.0756	0.195	1239	3.302049	3.517722	4.127995
China	1992	0.0602	0.1672	1493	-0.685987	0.5460538	3.156853
Colombia	1970	0.0698	0.149	2140			
Colombia	1978	0.031	0.1041	2797	-6.572845	-1.129235	3.403404
Colombia	1988	0.037	0.117	3231	3.263883	2.645039	1.452896
Costa Rica	1971	0.054	0.147	2974			
Costa Rica	1977	0.028	0.108	3649	-7.260192	-1.7144	3.467864
Costa Rica	1983	0.045	0.138	3081	5.219295	1.27343	-2.780592
Costa Rica	1989	0.04	0.131	3451	-0.072861	1.027805	1.90814
Dom. Repub	1984	0.054	0.148	2157			
Dom Repub	1989	0.042	0.121	2430	-2.608215	-1.631521	2.412089
Greece	1974	0.064	0.1815	4967			
Greece	1981	0.0678	0.1894	5903	3.34507	3.122769	2.497018
Greece	1988	0.0619	0.1778	6459	-0.014688	0.3837616	1.294215
Hong Kong	1971	0.057	0.158	4844			
Hong Kong	1976	0.053	0.153	6312	3.91369	4.76095	5.436886
Hong Kong	1981	0.0462	0.1437	9341	5.224895	6.806664	8.15467
Hong Kong	1986	0.0631	0.1579	11520	10.99139	6.266626	4.282593
Hong Kong	1991	0.0489	0.1507	15601	0.970822	5.265538	6.252704

Country	Year	Inc share - poorest 20%	Inc share poorest 40%	Per capita GDP 1985 US $	Inc growth - Poorest 20%	Inc Growth - Poorest 40%	Growth in per capita GDP
Indonesia	1976	0.08	0.1956	978			
Indonesia	1981	0.0772	0.2044	1480	7.867358	9.599099	8.638703
Indonesia	1987	0.0799	0.2087	1703	2.954909	2.72254	2.366728
India	1965	0.088	0.215	751			
India	1970	0.088	0.218	802	1.322731	1.603926	1.322731
India	1977	0.085	0.21	857	0.453077	0.4143096	0.9520652
India	1983	0.086	0.213	986	2.564233	2.606782	2.364495
India	1987	0.089	0.214	1123	4.195413	3.427078	3.306039
India	1992	0.088	0.213	1282	2.45194	2.587588	2.683734
Jamaica	1988	0.0541	0.1519	2443			
Jamaica	1991	0.0583	0.1604	2440	2.481598	1.789815	-0.04095
Jordan	1980	0.058	0.15	3384			
Jordan	1987	0.073	0.186	3649	4.459596	4.237407	1.082889
Korea, Repub	1965	0.058	0.1934	1058			
Korea, Repub	1970	0.073	0.1963	1680	14.85336	10.01642	9.689416
Korea, Repub	1976	0.057	0.1685	2558	2.925711	4.563106	7.258539
Korea, Repub	1982	0.0696	0.188	3395	8.379114	6.761875	4.831035
Korea, Repub	1988	0.0739	0.1968	5607	9.813145	9.55352	8.721423
Sri Lanka	1973	0.0717	0.1902	1253			
Sri Lanka	1981	0.0573	0.1532	1632	0.5022007	0.60097	3.358485
Sri Lanka	1987	0.0506	0.1414	2040	1.660205	2.411824	3.789082
Morocco	1984	0.0658	0.1765	1905			
Morocco	1991	0.0657	0.1702	2241	2.325473	1.817659	2.347709
Mexico	1968	0.028	0.079	3766			
Mexico	1977	0.029	0.103	4900	3.370135	6.048096	2.967875
Mexico	1984	0.041	0.119	5524	6.885919	3.84733	1.727131
Mexico	1989	0.032	0.102	5566	-4.69161	-2.888973	0.1516034
Malaysia	1970	0.04	0.117	2154			
Malaysia	1979	0.037	0.119	3470	4.531524	5.639713	5.440949
Malaysia	1984	0.042	0.128	4420	7.65348	6.50038	4.958728
Malaysia	1989	0.0458	0.1291	4674	2.890797	1.296989	1.123778
Nigeria	1986	0.0696	0.1916	973			
Nigeria	1992	0.066	0.1687	978	-0.796549	-2.01545	0.085463
Taiwan	1972	0.0884	0.2233	2626			
Taiwan	1978	0.0864	0.2232	3920	6.498168	6.897151	6.905133
Taiwan	1983	0.0849	0.2218	4902	4.206841	4.440976	4.57249
Taiwan	1989	0.0745	0.2067	7721	5.541875	6.605562	7.865702

Country	Year	Inc share- Poorest 20%	Inc share - Poorest 40%	Per capita GDP- 1985 us $	Inc growth - Poorest 20%	Inc growth - Poorest 40%	Growth in per capita GDP
Pakistan	1969	0.0916	0.2201	946			
Pakistan	1970	0.0916	0.2228	1029	8.773786	10.10813	8.773785
Pakistan	1979	0.0858	0.2109	1053	-0.469522	-0.353094	0.2565037
Pakistan	1988	0.0861	0.2137	1371	3.015546	3.12662	2.975603
Panama	1979	0.038	0.118	3062			
Panama	1989	0.02	0.083	2785	-7.10194	-4.368359	-0.943723
Philippines	1971	0.036	0.117	1432			
Philippines	1985	0.052	0.143	1542	3.205542	1.981366	0.5300298
Singapore	1980	0.0652	0.1727	7053			
Singapore	1988	0.0652	0.1727	10316	4.867806	4.867806	4.867806
Thailand	1975	0.0492	0.1501	1683			
Thailand	1981	0.043	0.137	2217	2.375844	3.118576	4.70006
Thailand	1986	0.042	0.129	2510	2.03232	1.287403	2.513628
Thailand	1992	0.037	0.113	3942	5.559963	5.460204	7.813667
Trinidad	1971	0.0194	0.0605	7349			
Trinidad	1976	0.027	0.116	8775	10.69199	18.01693	3.610502
Trinidad	1981	0.0343	0.1354	11738	11.18737	9.32048	5.991099
Venezuela	1971	0.036	0.13	7589			
Venezuela	1981	0.05	0.147	7209	2.810105	0.717851	-0.512379
Venezuela	1990	0.0361	0.1067	6055	-5.405903	-5.349985	-1.919623

CALCULATIONS OF THE GROWTH OF INCOME OF THE POOR

Variable Definitions:

S_{pt} Income share of the poor, given by Deininger and Squire data set

Y_{pt} Total amount of GDP held by the poor

Y_t Total GDP

Y_{pt} Average income of poor = per capita GDP

η_{pt}, η_t Number of poor, total population

g_p Growth rate of income of the poor

$$s_{pt} \equiv \frac{Y_{pt}}{Y_t}$$

Income share of the poor =Total income held by poor/total income

$$\overline{y_{pt}} \equiv \frac{Y_{pt}}{h_{pt}}$$

Average income of poor = Total income held by the poor/number of poor

$$\overline{y_t} \equiv \frac{Y_t}{h_t}$$

Average income = Total income/total population

$$\overline{y_{pt}} \equiv (s_{pt} /[\frac{h_{pt}}{h_t}])\overline{Y_t}$$

Income of the poor = Income share/ (number poor/total population, i.e. quintile) times average per capita GDP.

$$(1 + g_p) \equiv s_p \frac{2}{s_p} 1(1 + g)$$

1+ Growth rate of income of the poor = share of poor, period 2 over share of poor in period 1 times 1 + the growth rate of GDP

$$g_p \equiv s_p \frac{2}{s_p} 1g + (s_p \frac{2}{s_p} 1 - 1)$$

Growth rate of income of the poor
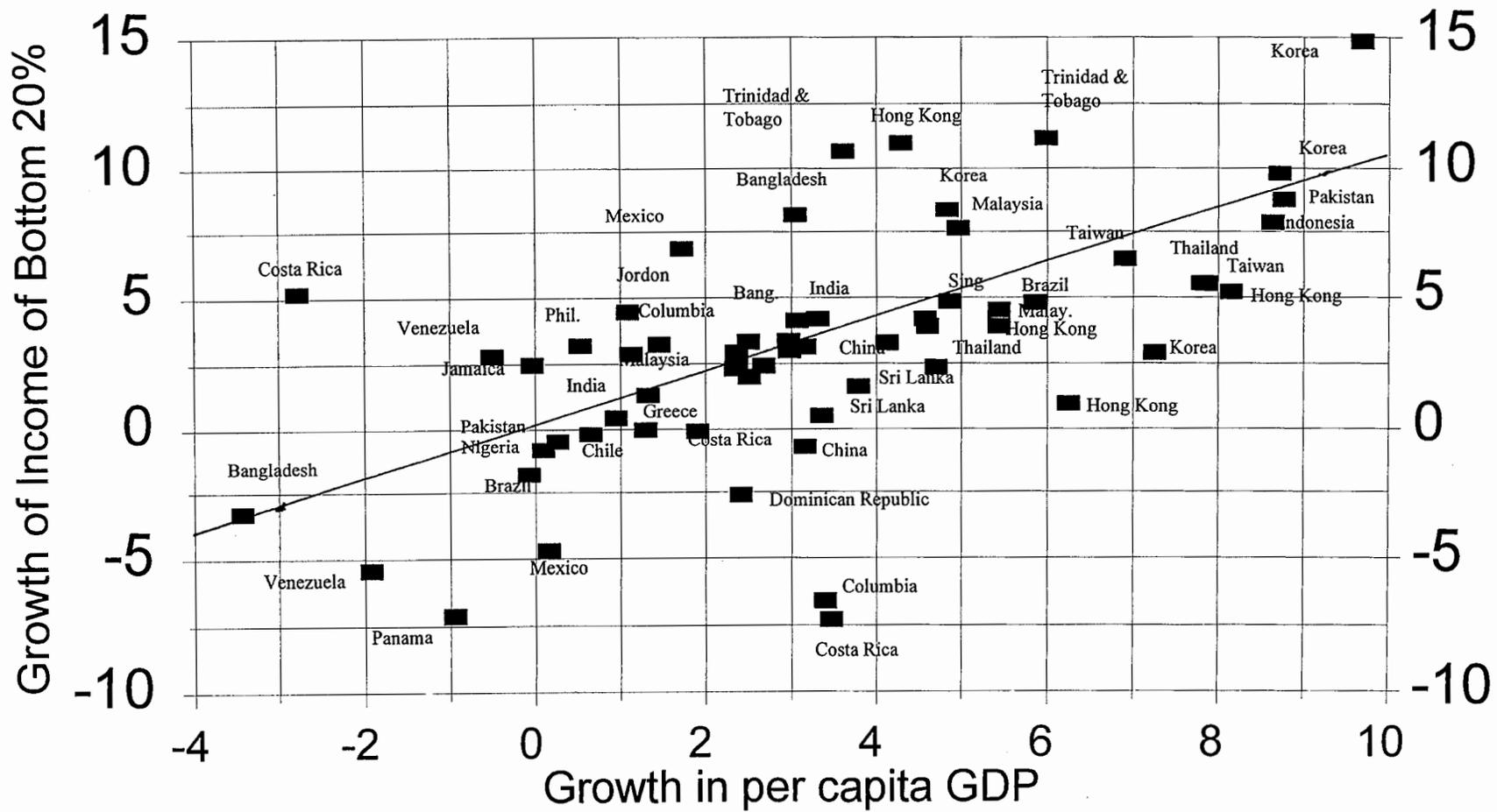
Figure 3
GDP Growth v. Inc. Growth: Poorest20%

Figure 4
GDP Growth v. Inc Growth: Poorest 40%