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Studies of Asian and Pacific Economic Issues

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Nanak Kakwani, Brahm Prakash, and Hyun Son

**Pro-poor Growth and Pro-growth Poverty Reduction:  
Meaning, Evidence, and Policy Implications**

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# Preface

The renewed focus on poverty reduction as the principal goal of development has generated keen interest in the interrelationship between poverty, economic growth, and inequality. Economic growth generates additional goods and services in the economy, which are then enjoyed by the population, even as all persons may not proportionately enjoy the additional goods and services produced. Economic growth impinges upon inequality in the society, which has important implications for poverty reduction. Inequality may increase or decrease with economic growth depending on the pattern of growth, which is itself determined by a complex set of interactions among policies, institutions, and socioeconomic processes. A deep understanding of the mechanisms underlying these interactions is fundamental for drawing out policy implications, to see how policy objectives such as poverty alleviation can be accomplished along with rapid economic growth.

This volume presents selected papers from The Asia and Pacific Forum on Poverty: Policy and Institutional Reforms for Poverty Reduction sponsored by the Asian Development Bank. The focus of this volume is on the interrelationship between economic growth, inequality, and poverty. This interrelationship has been a subject of extensive research in recent years. Most of this research is based on the use of cross-country regressions that depict only average patterns in the results, not country-specific features, which may be quite different. Moreover, the conclusions emerging from these studies cannot be conclusive because of many well-known limitations of the methodology used. This volume has papers that utilize both cross-country regressions and specific country analyses to bring out some new insights to this important interrelationship.

Brahm Prakash  
Nanak Kakwani

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# Growth, Inequality, and Poverty: An Introduction

Nanak Kakwani, Brahm Prakash, and Hyun Son

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***Abstract.** The paper provides a summary of all the papers in this special volume. It also gives a brief theoretical introduction to the subject of growth, inequality, and poverty, including the neoclassical growth and new growth theories. It discusses the relationship between growth and inequality, and presents empirical evidence that argues that growth does not lead to inequality. The reverse causation from inequality to growth is also examined. The Dollar and Kraay methodology, which concludes that growth is good for the poor, is also reviewed. Finally, the paper argues that the emphasis on pro-poor growth policies will reduce poverty more rapidly than simple reliance on the trickle down effect. However, poverty reduction with growth also depends on initial inequalities and assets.*

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## Economic Growth

**E**conomic growth rates differ widely between countries. The old growth theory that predicted a convergence of growth rates has been questioned by various empirical analyses based on cross-country growth experiences. Instead, empirical evidence shows a tendency toward divergent growth rates across countries. For most developing countries in sub-Saharan Africa, gross domestic product (GDP) per capita fell by 15 percent between 1980 and 1998, while those in Latin America recorded an average growth rate of 6 percent. Moreover, Asian economies have shown spectacular growth performance that is even higher than Latin American economies throughout the period. Why do growth rates differ widely between economies during the same period of time? This has spurred new research that returns to growth issues including the new growth theory (NGT) and empirical works explaining growth performances for the last two decades. In explaining different levels of income and growth rates across nations, NGT has drawn the most attention in the economic literature.

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The orthodox neoclassical growth theory by Solow (1957, 1994) made a controversial prediction on the convergence of per capita income across countries after controlling for factors such as savings rates, population growth, and so forth. This conditional convergence hypothesis suggests that a country that initially has a lower level of per capita income grows faster because it has less per capita capital relative to the steady state level, and thus a higher marginal return to capital and a higher rate of per capita growth. This hypothesis can explain quite considerably the differences in per capita incomes across countries through variations in the savings rate and population growth. However, recent empirical evidence suggests that factors such as endogenous technical progress, human capital accumulation increasing returns to research and development (R&D), and government policies might have a stronger and better explanatory power in determining the variation in per capita income across countries (Barro and Sala-i-Martin 1995). These factors are in fact the central themes of the endogenous growth theories established on the basis of neoclassical economics.

The NGT takes into account positive externalities stemming from private efforts on R&D, which improves the stock of knowledge in the economy as a whole (Romer 1986, 1994). Unlike the neoclassical theory, technology is incorporated as an endogenous variable in the modern growth theory. In the NGT economic world, long-run economic growth can be achieved through increasing returns to scale at the level of society, with these returns coming from investment in R&D at the firm level. Overall, R&D contributions to the total stock of technology or knowledge will give rise to a higher growth rate. This in turn raises an important policy implication in favor of free international trade across nations, which may encourage R&D across countries. It further implies that investment in R&D can make labor more mobile across countries.

Another crucial source of economic growth that is highlighted by the NGT is skills and knowledge of the labor force. These skills and knowledge enhance the productivity of factors of production through activities such as education and on-the-job training. Barro (1989), Lucas (1988), and Romer (1990) argue that investment in human capital leads to increases in efficiency of labor, which in turn results in output growth.

Skilled labor has positive effects on the productivity of both capital and labor. The NGT, following from the Solow model, argues that investment in human capital, generated from savings, increases the future market value of labor. The accumulation of human capital through education and on-the-job training helps to avoid physical capital from diminishing its returns, and makes possible the continuing growth of an economy.

For instance, the rapid growth of the economy of Republic of Korea (henceforth Korea) is due largely to the nation's high level of education. As argued by Young (1995) and Nelson and Pack (1999), coupled with factor accumulations in physical

capital and labor force, an increase in human capital through improved educational levels accounts for the fast economic growth experienced by Korea. The proportion of the Korean workforce with a secondary education has tripled between the mid-1960s and mid-1990s. This high level of education has enabled the labor force to absorb rapid changes in technology. Moreover, education has played a pivotal role in improving productivity in agriculture and industry within the Korean economy.

In the framework of NGT, government policies are also important in determining economic growth in the long run. A change in the tax structure that makes savings more attractive may promote incentives to invest in education or training, which will have large and sustained effects on the growth rate of an economy as a whole through the increased efficiency of factors of production. Well-established intellectual property rights encourage research and development within the economy, which will speed up economic growth through the spill-over effects of R&D on the overall stock of knowledge. Moreover, through open market policies such as deregulation of exports and financial markets, the mobility of factors of production across countries acts to strengthen economic growth.

In summary, endogenous growth theories attempt to explain the nonconvergence of per capita income levels between developing and developed countries in terms of the allocation of resources and the amount of resources devoted to research and development (Temple 1999). Moreover, the new theories explore possible determinants of long-run growth, with emphasis on the roles of technology, international free trade, human capital, returns to scale, externalities, and so forth. Further, the new growth theory offers the important insight that economic institutions and government policies play crucial roles in determining long-run growth.

Economic growth is closely interrelated and intertwined with inequality and poverty. The interrelationship between the three phenomena reflects the pattern of growth, which can differ from country to country. Recognizing the diversity of individual country experiences, it may still be possible to make some general observations about the relationship between growth, inequality, and poverty.

### **Growth and Inequality**

Kuznets (1955, 1963) undertook research to find the determinants of the long-run levels and trends in income inequality and the relationship between economic growth and income inequality. He postulated that inequality in income distribution worsens initially when economic development takes off and then improves in the mature stage of industrialization. This hypothesis is now popularly known as "inverted U-shaped pattern of income inequality"—inequality first increasing then decreasing with economic development. This hypothesis assumes that the economy consists of a low mean income and low inequality in the rural agricultural sector and

a high mean income with high inequality in the urban industrial sector. It also assumes that migration occurs from the rural sector to the urban sector, which increases aggregate inequality.

In explaining his hypothesis, Kuznets emphasizes the structural change that occurs in the course of economic development. As an economy progresses the importance of industry tends to expand, shifting from the primary agricultural sector to the modern industrial sector that includes manufacturing and services. During this economic transition, labor productivity in the modern sector is higher than in the agricultural sector so the per capita income of the modern sector is also expected to be higher. As a result, inequality between the two sectors increases in the initial stages of economic development and later declines.<sup>1</sup>

The Kuznets hypothesis was able to explain the relationship between inequality and economic growth for the industrialized countries until the 1970s. Notwithstanding that Kuznets himself was inconclusive on the hypothesis, numerous studies that support the hypothesis have been produced. These studies began with Kravis (1960), followed by, among many others, Oshima (1962) who “fully confirmed” the Kuznets finding, Adelman and Morris (1971), Paukert (1973), Ahluwalia (1974, 1976) who deemed the hypothesis as a “stylized fact”, Robinson (1976) who said that the hypothesis was an “economic law”, and Ram (1988).

With the emergence of numerous cross-country studies in the 1970s, Kuznets’s hypothesis had acquired the status of modern paradigm (Saith 1983). The curve has important implications for formulating poverty reduction strategies. If inequality rises at the early stage of development, it is possible that growth alone will not be sufficient to alleviate poverty at least in the foreseeable future, or growth may completely bypass the poor. The emphasis then should be placed on direct poverty reduction policies even if they amount to sacrificing some growth.

In the 1980s, the paradigm began to be questioned. Anand and Kanbur (1984) criticized the studies that supported the Kuznets hypothesis on the grounds that they used defective data and questionable methodology. More recently, Oshima (1994) concluded that the Kuznets relationship “is all, but absent in present-day Asian countries”. Recently compiled data set on international inequality by Deininger and Squire (1996) has provided an opportunity to make a deeper enquiry into this subject. This data set is much larger and of higher quality containing 682 observations on the Gini index for 108 countries. Analyzing this high-class data set, Deininger and Squire (1998) conclude that there exists no support for the Kuznets hypothesis of inverted U-shaped curve. When tested on a country-by-country basis, they found that 90 percent of the countries investigated did not validate the Kuznets hypothesis.

There is also a slightly modified “dynamic version” of the Kuznets hypothesis, which postulates that inequality increases as the rate of growth of income goes up. It

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<sup>1</sup>See Kakwani (1988) for a detailed discussion of this model. He derives the conditions under which the Kuznets curve will exist.



means that under faster growth rates, the poor will receive proportionally lower benefits of growth than the rich. Fields (1989) did not find any systematic relationship between changes in inequality and the rate of growth of income. Using their higher-quality data, Deininger and Squire (1998) also investigated the relationship between changes in inequality and rate of economic growth. They conclude that there appears to be little systematic relationship between growth and changes in aggregate inequality. Periods of growth were just as often associated with increases in inequality as they were with declines.

The paradigm seems to have evaporated. There exists no solid evidence of increase in inequality with economic growth. Ravallion and Chen (1997) have in fact provided an evidence of declining inequality with economic growth. Looking at a sample of 64 changes in inequality and economic growth between 1981 and 1994, they found a negative correlation between economic growth and changes in inequality. This correlation disappears, however, when they exclude the transition economies of Eastern Europe and Central Asia. Most recent research seems to suggest that inequality as measured by the Gini index has remained stable over time in a large number of countries (Li et al. 1998). It means that economic growth tends to neither increase inequality nor decrease it. This result clearly has important implications for poverty reduction. It implies that rapid economic growth will generally be accompanied by a rapid reduction in poverty.

### **Reverse Causation: Inequality to Growth**

Is inequality good or bad for growth? This issue has attracted much attention in the economic literature. In the views put forward in the older economic literature, economies with unequal distribution of income will supposedly grow faster than those economies with equal income distribution. This thinking is based on the standard economic theory that marginal propensity to save is higher for the rich than for the poor. Thus, economies with higher inequality of income or wealth are likely to have higher rates of savings, which translate into high investment and thus output growth.

Similarly, neoclassical theory provides a linkage between inequality and economic growth. Changes in the tax structure that have a direct influence on savings can change growth rates depending on changes in the ratio of capital to labor. In this framework, returns to savings determine people's motives to accumulate income or wealth, which changes the distribution of income or wealth. Therefore an economy with a regressive income tax that makes society more unequal through income redistribution may offer strong incentives for the rich to save or accumulate their wealth and thus induce faster output growth. Here the rapid rate of economic growth is traded off with higher inequality of income or wealth.

Another argument for a positive relationship between growth and inequality is based on the issues associated with attitudes toward the risk of costly investment projects. Heavy investment in physical and human capital not only generates high costs but also requires risk taking. Thus, generally only rich people can bear to take on the risk of high costs so these are the people who can exert a big push to new investment projects that have potential to promote economic growth.

These arguments have been criticized heavily by recent empirical studies. For instance, Korea has experienced both high growth in GDP per capita together with low and stable inequality for the last three decades. In contrast, Thailand's growth performance has been impressive in comparison to other countries in Asia as well as outside Asia, but inequality has remained high throughout the development process. Overall, today a consensus is emerging toward a view that high inequality reduces growth rates as argued by Aghion et al. (1999). The main policy implication that emerges from their study is that "when capital markets are imperfect, there is scope for re-distributive policies, which are also growth-enhancing". This study also points out the importance of sustained redistribution. As suggested by this study, a one-time reduction in after-tax inequality that would foster investment incentives and growth in the short run would result in an upsurge in inequality as a consequence of technical progress it induces. What is, therefore, needed is to have permanent redistribution policies in order to both control the level of inequality and foster growth. Thus, the future research should focus on designing and implementing such policies.

On the whole, the consensus emerging is that the relationship between inequality and the growth rate of GDP per capita depends on the equal initial distributions of physical and human capital, how the process of growth affects the returns to those assets, and on the effectiveness of redistribution policies through tax and transfer systems (Frank and Webb 1977, Lipton and Ravallion 1993, Aghion et al. 1999).

### **Growth and Poverty**

A view held widely in development economics is that the benefits of rapid economic growth rates diffuse automatically across all segments of society. This view is based on the trickle-down theory that was the dominant development thinking in the 1950s and 1960s. It implies a vertical flow from the rich to the poor that happens in the ordinary course of economic functioning. The benefits of economic growth go to the rich first, and then in the second round the poor begin to benefit when the rich start spending their gains. Thus, the poor benefit from economic growth only indirectly through a vertical flow from the rich. This implies that the proportional benefits of growth going to the poor will always be less. Still it was believed that growth will rapidly reduce poverty. Thus the main concern of

economists in the 1950s and 1960s was to enhance growth by means of increasing savings and investments. By the early 1970s, the trickle-down theory lost some of its shine. The basic needs approach became the dominant thinking among economists and the international organizations, particularly the World Bank and the International Labour Organisation.

Recent cross-country analyses show that growth and poverty reduction are strongly positively correlated, or in other words, growth and poverty reduction go hand in hand. The countries that have experienced high growth over a sustained period have made a greater reduction in poverty. Ravallion and Chen (1997) show that a 10 percent increase in the mean standard of living leads to an average reduction of 31 percent in the proportion of the population below the poverty line. This result indicates that growth can reduce poverty incidence very rapidly. Why then has there been so much skepticism of the “trickle down” phenomenon in the post-1970 period? A simple answer to this question is that the cross-country analysis is indicative of average trends, while individual country experiences can vary quite significantly. In many countries, the high incidence of poverty persisted despite having decent growth rates. It is the slower rate of poverty reduction in many countries that has generated keen interest in the concept of pro-poor growth.

The degree of poverty depends on two factors: average income and income inequality. An increase in average income reduces poverty and an increase in inequality increases it. Economic growth increases average income (or consumption), but at the same time it may be accompanied by increasing or decreasing inequality. The increase (decrease) in inequality implies that the proportional benefits received by the poor are less (more) than those of the non-poor. Thus, in strict terms, growth is pro-poor when it is accompanied by a reduction in inequality.

The pro-poor growth reduces poverty more rapidly than nonpro-poor growth. It has been found that there can be large variation in poverty reduction for the same growth rate in per capita GDP. It means that some countries have a more pro-poor growth than others. What explains these differences? If growth is accompanied by increase in inequality, then poverty reduction will be slower with the same growth rate. In some cases, inequality effect may dominate over the growth effect and poverty may even increase with growth. The empirical evidence shows that such situations are rare. The incidence of poverty can be reduced even if growth is accompanied by an increase in inequality. This situation may be characterized as “trickle down” phenomenon.

Recent empirical studies have found that the rate of poverty reduction with growth also depends on initial inequalities in income and assets. Using cross-country regressions, Ravallion (1997) estimated poverty elasticity with growth with different levels of initial inequality. He found that poverty elasticity, which measures the responsiveness of poverty with respect to growth, is lower, the higher is the initial level of inequality. A country with a Gini index of 0.25 is likely to have a poverty

elasticity of  $-3.3$ , which implies that a growth rate of 1 percent will reduce the incidence of poverty measured by the percentage poor by 3.3 percent, while one with a Gini index of 0.6 is likely to have a poverty reduction of 1.8 percent. These results clearly show that the initial inequality of income is very important in explaining differences in rate poverty reduction in different countries. Deininger and Squire (1998) also reached the similar conclusion that “initial inequality hurts mainly the poor, but not the rich.” They argue that this finding is consistent with the theoretical literature that emphasizes credit rationing and the inability of the poor to undertake productive investments as mechanisms through which the effects of initial inequality and growth may be transmitted.

### **Growth is Good for the Poor: A Critique of the World Bank Study**

A recent study at the World Bank by Dollar and Kraay (2000) concludes that the income of the poor rises one-for-one with overall growth. This general relationship between the income of the poor and per capita GDP growth holds in a sample of 80 countries over four decades. Economic growth over a period of four decades has not changed the relative inequality; the proportional benefits of growth going to the poor are the same as those enjoyed by the nonpoor. Thus the authors make a strong case for growth-maximizing policies concluding, “growth generally does benefit the poor and that anyone who cares about the poor should favor the growth-enhancing policies of good rule of law, fiscal discipline, and openness to international trade” (Dollar and Kraay 2000).

The Dollar-Kraay study suggests that governments need not follow pro-poor growth policies. They should simply maximize economic growth provided they avoid high inflation and maintain fiscal discipline. Not surprisingly, the study has generated a heated debate on the role of economic growth in reducing poverty. An Oxfam policy paper (Oxfam 2000) has made a severe attack on the conclusions emerging from the Dollar-Kraay study. It says, “Growth is good for the poor reflects an ideological hankering for a return to the golden age of free market economics in the 1980s. Openly supported by some northern governments, it is an attempt to radically change the direction of development policy” (Oxfam 2000). These strong sentiments have been expressed more due to ideological bias than to facts. It would be more appropriate to evaluate the Dollar-Kraay study on the basis of an objective assessment of its methodology. This is what is attempted here.

Dollar and Kraay estimate the variants of the following regression of the logarithm of per capita income of the poor on the logarithm of per capita income:

$$\bar{y} = \alpha_0 + \alpha_1 \bar{x} + \alpha_3 X + \varepsilon \quad (1)$$

where  $\bar{y}$  is the logarithm of per capita income of the bottom 20 percent of the population and  $\bar{x}$  is the logarithm of per capita income of the whole population and  $X$  is the vector of other determinants of the mean income of the poor and  $\varepsilon$  is the unobserved error term. The parameter  $\alpha_1$  is the elasticity of the mean income of the poor with respect to the mean income of the whole population. A value of  $\alpha_1=1$  indicates that growth in total mean income is translated one-for-one into growth in mean income of the poor. Here, the poor are defined as those who belong to the bottom 20 percent of the population.

The regression equation (1), when estimated using ordinary least squares method (OLS) gives a poverty elasticity of 1.06, which is just significantly greater than 1. An important implication of this result is that the economic growth is generally pro-poor; a 1 percent increase in the mean income of the total population will increase the mean income of the poor by more than 1 percent. If this result were generally true, then there would not exist any poverty at least in East Asia, which has enjoyed very high growth rates during the past three decades. Interestingly, when a refined instrumental variable method is used, the elasticity falls to 0.96, which makes the growth not so pro-poor. The authors rejected this elasticity on the grounds that it is much less precisely estimated because the instruments used were not very strong. The authors then estimated the regression equation in first differences and found an elasticity of 1.02 using OLS and a larger elasticity of 1.06 using the instrumental variable method. The authors accepted the larger elasticity on the grounds that the instrumental variable method gave more precise results when the first difference equation is used. The authors' preferred estimation method is the one, which, combining the level and difference equations in the system estimation, gives a poverty elasticity of 1.05. It is difficult to accept how one could combine level and difference equations into a system of equations. One can either use the level equation or the difference equation depending on what assumptions are made about the serial correlation in the error term. If the error term in the level equation is a white noise, then the level equation is appropriate. If the error term follows a random walk, then the difference equation is more appropriate. Surely, both assumptions cannot hold in the same data.

In the cross-country regressions, the problem of heteroscedasticity is unavoidable. This problem occurs because the variance of error term is not constant across observations. The countries vary widely with respect to their population. And, therefore, the variance of error term will also vary across countries because of differences in population. The appropriate method to estimate regression equations is the weighted least squares with weight proportional to the population. The Dollar-Kraay study uses the unweighted method of estimation, which gives equal weight to every country irrespective of their population. Thus, a tiny country with a population of one million gets the same weight as countries like People's Republic of China and

India with a population of more than one billion. It would be interesting to see how the conclusions change when the weighted estimation is used.

The dependent variable in the Dollar-Kraay study is the logarithm of per capita income of the bottom 20 percent of the population. This variable is estimated by multiplying the income share of the poorest quintile by the mean income of the total population divided by 0.2. The Deininger-Squire data set, which is used in their study, does not provide the income shares of the quintiles for many countries. Thus the per capita income of the poorest quintile could not be estimated for about one fourth of the countries included in the study. However, the Gini index was available for all the countries in the data set. Dollar and Kraay used a lognormal approximation to estimate the per capita income of the bottom quintile for those countries for which income shares of quintiles were not available. Given a lognormal distribution of income, the per capita income of the bottom quintile is estimated as (Aitchinson and Brown 1966):

$$\bar{y} = -\gamma G + \bar{x}, \quad (2)$$

where  $G$  is the Gini index, which lies between 0 and 100 and  $\gamma = 0.036$ . Note that this is a linear approximation to an exact one but the difference between them may be very small. An important point to be made is that the two-parameter lognormal distribution does not generally fit the income distributions so it is now seldom used. This approximation may thus give biased estimates of the poverty elasticity.

Although theoretically the Gini index lies between 0 and 100, in practice, it does not take such extreme values. Looking at the cross-country data, it is reasonable to say that the Gini lies in the maximum range between 25 to 65 percent. It means that the maximum range for the variable  $-\gamma G$  will be between  $-2.34$  to  $-0.9$ , while  $\bar{x}$  will vary widely across the countries because of the wide disparity of income between the countries. Thus, if the variable  $-\gamma G$  is regressed on  $\bar{x}$  and  $X$ , the coefficient of  $\bar{x}$  will approach 0, irrespective of whether inequality increases or decreases with income. Since the elasticity of  $\bar{y}$  with respect to  $\bar{x}$  is always equal to 1, which means that the poverty elasticity obtained by regressing  $\bar{y}$  as defined in (2) will always be close to 1, irrespective of whether inequality increases or decreases with income across the countries. Thus, Dollar and Kraay may have obtained the poverty elasticity of one because of the bias introduced by the lognormal approximation they used. When they dropped the countries for which no lognormal distribution was used, the poverty elasticity falls to 0.96, which is not significantly different from 1 but still lower than 1. Thus, their results are not as powerful as they make out to be.

## **Overview of the Papers**

### **Measurement, Policy, and Diversity**

The first paper in this volume by Robert Eastwood and Michael Lipton (Eastwood and Lipton 2000) provides a comprehensive description of pro-poor growth and its relationship with poverty reduction. The paper covers an extensive portion of the growth–poverty debate, discussing different attempts at measurement of inequality and poverty reduction in the literature. While highlighting the relative merits and limitations of these major studies, the paper keeps a focused perspective on the policy aspects of the problem.

Eastwood and Lipton examine closely the methods and results of the main measurements studies. They illustrate problems of definitions and measurements and how these hamper a more useful interpretation of the statistical findings. They begin by commenting on the choice of poverty lines—whether national, dollar a day, or measuring relative poverty. They also point out the issues that arise out of unreconciled sources of growth and poverty data, e.g., household surveys, national accounts, consumption expenditure and income, etc. The bulk of discussion however focuses on elasticity of connection between mean per capita GDP and mean income of the poor however measured and they highlight several aspects of this relationship lucidly.

The authors feel that there is an excessive concentration of growth–poverty relationships across the entire sample, often including developed, transitional, and developing countries together. This is capable of clouding the effects, and precluding appropriate policy inferences; hence implying that a separate analysis of these by country types or policy regimes is preferable. They say, “...a pro-poor growth path is not fully distinguishable, analytically or empirically, from a pro-poor growth path of poverty reduction or of low-end equalization.” Nevertheless Eastwood and Lipton go on to outline the areas where there are clear grounds for consensus, and where nothing definitive can be said about the growth and poverty relationship.

Finally, Eastwood and Lipton also assess the effect of different degrees and types of initial inequalities in determining the relationship between the rate of growth and the pace of poverty reduction. In conclusion they suggest that a less aggregated and more micro-based and causal structural analysis of pro-poor growth might help policy makers in delineating the policies favoring growth, equality, and poverty reduction.

### **Is Economic Growth Good for the Poor?**

The second paper in this volume is by James E. Foster and Miguel Székely (Foster and Székely 2000). They conclude that the incomes of the poor do not grow

one-for-one with increases in average income. Their study is based on 144 household surveys from 20 countries over the last quarter century. They followed a somewhat different methodology from that of Dollar and Kraay. They tracked low incomes based on Atkinson's (1970) class of "equally distributed equivalent income" function, which they call "general means", whereas Dollar and Kraay use the mean income of the bottom quintile to measure the standard living of the poor.

Foster and Székely raise an important methodological issue of tracking down the income of the poor; in other words, how can the standard of living of the poor be measured? In the poverty literature, the traditional method is to first specify a poverty line below which a person is identified as poor, and then measure the aggregate deprivation suffered by those who are identified as the poor. Thus, the measurement of poverty involves two distinct issues, namely, identification and aggregation. It is the aggregation issue that has attracted most attention in the literature.

The percentage of the population falling below the poverty line, or the head-count ratio, is the most widely used measure of poverty. This ratio does not reflect the intensity of poverty suffered by the poor. It was Sen's (1976) seminal paper that pointed out that all the poor below the poverty cannot be treated alike. Some poor are poorer than others, so the poor should be given different weights depending on the degree of deprivation suffered by them. This paper led to a large literature on poverty measurement (see for instance Kakwani 1980; Clark, Hemming, and Ulph 1981; and Foster, Greer, and Thorbecke 1984).

The traditional poverty measures are estimated on the basis of a pre-specified poverty threshold. For instance, in the cross-country studies, Ravallion (2000) employs absolute standards of \$1 and \$2 a day to identify the poor and then aggregates using the most common poverty measures. So some degree of arbitrariness is always involved in specifying the poverty thresholds. Foster and Székely, therefore, question this approach by asking "why should an income slightly higher be ignored, just because it is above the arbitrary cutoff that is employed?" Dollar and Kraay measured poverty by the mean income of the bottom 20 percent of the population. This is a relative approach to measuring poverty and can hardly be justified as a coherent line of separation between the poor and nonpoor.

Foster and Székely employ a social welfare approach to measuring poverty, wherein different individuals in the society receive different weights depending on the objectives of the society. If the objective is to reduce poverty, then the poorer persons receive greater weight than the richer persons. An aggregate poverty measure is basically a social welfare function, in which the poor receive all the weight and nonpoor do not receive any weight. But in such a function, one needs to identify exactly who is poor and who is nonpoor. Foster and Székely argue that there is no need to arbitrarily partition the population into poor and nonpoor groups. The weighting scheme can be continuous, in which the nonpoor also receive positive weight, which may be made as small as one wishes.



The general means are derived from the Atkinson's (1970) idea of equally distributed equivalent level of income, the level which, if received by every individual, would result in the same level of social welfare as the actual income distribution. Atkinson assumed that the social welfare function is utilitarian and every individual has exactly the same utility function. Under these assumptions, the equally distributed equivalent level of income  $x^*$  is given by

$$u(x^*) = \frac{1}{n} \sum_{i=1}^n u(x_i)$$

where  $n$  is the number of individuals in the society and  $u(x_i)$  is the utility derived by an individual with income  $x_i$ . In order to make the social welfare function homogeneous of degree one, the utility function has to be homothetic. A class of homothetic utility function is of the form

$$\begin{aligned} u(x) &= A + B \frac{x^\alpha}{\alpha}, & \alpha \neq 0 \\ &= A + B \log_e x, & \alpha = 0 \end{aligned}$$

Under this utility function, the equally distributed equivalent level of income denoted by  $x_\alpha^*$  is obtained as

$$\begin{aligned} x_\alpha^* &= \left( \frac{1}{n} \sum_{i=1}^n x_i^\alpha \right)^{\frac{1}{\alpha}}, & \alpha \neq 0 \\ &= \exp \left( \frac{1}{n} \sum_{i=1}^n \log_e(x_i) \right), & \alpha = 0 \end{aligned}$$

$x_\alpha^*$  is the general mean. It is a legitimate measure of social welfare.  $\alpha$  is a parameter, the value of which determines the weight given to income of different individuals in the society. If  $\alpha=1$ , the general mean is equal to the mean income of the society, which is a social welfare function in which every individual in the society receives the same weight. If the society's concern is more with the poor, then the value of  $\alpha$  should be smaller than one. The smaller the value of  $\alpha$ , the larger is the weight given to the poor.

Using a cross-country regressions methodology, Foster and Szekely computed the elasticity of the general mean  $x_\alpha^*$  with respect to the ordinary mean income, denoted by  $\bar{x}$  for values of  $\alpha$  equal to 0, -1, -2, -3, and -4. Thus, five separate regressions in first differences were estimated. The empirical results they obtained are striking. They found that the lower the value of  $\alpha$ , the smaller the elasticity. This means that the greater the weight attached to the incomes of the poorest individuals, the smaller the gain from growth. The values of elasticity for  $\alpha$  equal to 0, -1, -2, -3,

and -4 were 1.08, 0.93, 0.77, 0.36, and 0.33, respectively. These empirical results clearly show that the poor gain proportionally much less than the average individual. These results are at odds with the results obtained by the Dollar-Kraay study, which has attracted so much attention. Thus, this study casts doubt on the result that income of the poor rises one-for-one with overall growth.

### **Growth Versus Inequality Reduction Strategies**

The third paper in this volume by Nanak Kakwani (Kakwani 2000a) has a simple message that all countries cannot have the same policies. For some countries, growth-maximizing policies may be adequate but for others, there may be a need to have pro-poor growth policies with a focus on reducing inequality. His paper addresses the issue of ex-ante choice of development strategy for a specific country.

As pointed out earlier, the degree of poverty depends upon two factors: average income and income inequality. The increase in average income reduces poverty and the increase in inequality increases it. Thus, the change in poverty can be decomposed into two components: one is the growth component relating to change in mean income, and the other is the inequality component relating to change in inequality. The magnitudes of the two components provide the relative sensitivity of poverty reduction to growth and inequality. It is obvious that if the growth component dominates over the inequality component, then growth-maximizing policies may be adequate in achieving a rapid reduction in poverty. If the inequality component dominates, then the policies that are pro-poor and thus reduce inequality should be adopted.

Kakwani develops a methodology to measure the tradeoff between inequality and growth, which shows how much growth is needed in order to offset the adverse impact of an increase in inequality on poverty. He derives the inequality-growth tradeoff index (IGTI), which is equal to the negative of the ratio of inequality to growth elasticity of poverty. If, for example, IGTI is equal to 3.0, it means that a 1 percent increase in the Gini index will require a growth rate of 3 percent in order to offset the adverse impact of increase in inequality. It also means that by following a pro-poor strategy, if we can reduce the Gini index by 1 percent, then this strategy is equivalent to having an additional 3 percent growth rate. This suggests that the larger the IGTI, the greater will be the benefits of following pro-poor strategy that would reduce inequality. Thus, the magnitude of the IGTI can give an indication of what development strategy a country should follow.

In addition to the methodological aspect, the paper also provides empirical analyses based on four nations that face different stages of economic development: Korea, Lao PDR, Philippines, and Thailand. These countries provide an interesting comparative study as to which economy is more effective in reducing poverty by

choosing between growth-enhancing strategy and pro-poor growth strategy that takes into account inequality.

To begin with, IGTI computed for Thailand indicates that pro-poor policies may be prescribed as a remedy to reduce poverty. In general, Thailand is said to be a country with high inequality and rapid economic growth. On average, the economy has exceeded its growth in GDP per capita over an annual rate of 6 percent for the last two decades. However, the inequality of income (or consumption) has been extremely high at the same time, surpassing the Gini index of 48 percent. Large regional disparity within the country is frequently blamed for its high aggregate inequality. Uneven distribution of income in Thailand seems to have offset the benefits of fast economic growth in terms of poverty reduction. Consequently, the rate of poverty reduction has been much slower than expected. Growth-maximizing policies alone will not be sufficient to achieve a rapid reduction in poverty.

Unlike Thailand, Korea is known to be a nation with high economic growth and low inequality. Similarly, Lao PDR is often cited as an egalitarian society (World Bank 1995, Kakwani 2000). Although Korea and Lao PDR exhibit different stages of economic development today, they have one common aspect that their society is relatively equal. As IGTI shows, these countries with low inequality have much lower payoff for choosing a pro-poor strategy in reducing poverty. In fact, the payoff is far outweighed by that derived from a growth-enhancing policy. To reduce poverty rapidly, thus, Korea and Lao PDR may be advised to follow a growth-enhancing policy instead of a pro-poor growth policy.

The Philippines's performance in both growth and poverty reduction has not been as good as that of Korea and Thailand. While its growth rate has been much lower, the Philippines has maintained a high level of inequality and also high incidence of poverty. Kakwani suggests that a mixture of growth and pro-poor policies may be deemed appropriate.

The paper also investigates a hypothesis as to whether the initial level of inequality matters in choosing an appropriate policy option in reducing poverty. After carrying out simulations on the data from the four countries, he arrives at a general conclusion that countries with low initial inequality will have a greater poverty reduction payoff from growth, whereas countries with high initial inequality will have a greater poverty reduction payoff from pro-poor growth policies. In addition, Kakwani makes a point that pro-poor policies are in particular effective in reducing ultra poverty. Thus, if the focus of policymakers is on reducing ultra poverty, then pro-poor policies that reduce inequality combined with better access to social services should be of greater benefit.

### **Growth Strategies and Poverty Reduction**

The fourth paper by Siddiqur Rahman Osmani (Osmani 2000) gives a comprehensive discussion on the overall relation between growth and poverty. Based on the findings of early studies, he acknowledges the existence of a strong and positive relation between the two. Nevertheless, he does not agree with the view that maximizing growth is a development policy option that leads to maximum poverty reduction. Instead, he emphasizes the importance of the growth pattern that will reduce the rate of poverty in society.

Osmani defines a growth strategy as a set of policies designed to promote economic growth by allocating resources, either by molding the structure of incentives, or directly by redistributing resources between different sectors of production as well as between different owners of factors of production. A given growth strategy will lead to a certain rate of growth and a certain distribution of income depending on how the resources are allocated. Thus, a “pattern of growth” emerges and it is the “pattern of growth” that determines the degree of poverty reduction achieved by a country.

Using a simple stylized model, Osmani argues that the strategy of maximizing the rate of growth will not always induce the most pro-poor pattern of growth. In his model, he assumes that growth can be achieved by the accumulation of either human or physical capital, and the pattern of growth will depend on the differential factor intensities. He further assumes that any increase in the rate of savings will change the income distribution in favor of the rich. Using these assumptions, he arrived at the following propositions.

- (i) Up to a point, growth can be accelerated with little or no worsening of income distribution by following a growth strategy that relies relatively heavily on human capital accumulation. But as the growth rate is pushed further, inequality will have to rise because growth will then have to rely on physical capital.
- (ii) If the rate of growth is pushed too far, the faster growth may eventually lead to slower reduction of poverty, depending on how steeply inequality happens to rise and how far the rate of growth is pushed.
- (iii) Other things remaining the same, lower initially inequality enhances an economy’s opportunity to pursue high growth rates without pausing in the rate of poverty reduction.

The model does not talk about the concentration of savings that plays a crucial role in determining inequality as well as poverty in the process of economic development. Although the model provides a linkage between savings and inequality and poverty, it seems to underestimate the importance of the overall distribution of

savings across individuals in society. As an economy develops, the concentration of savings falls, which implies that additional savings can be generated without worsening of inequality (Kakwani and Son 2001).

In the paper, Osmani discusses three growth strategies: outward-oriented trade and industrial development, agriculture-led growth, and redistributive reform.

It is commonly believed that free trade promotes faster growth and possibly poverty reduction. However, empirical evidence in this respect is not clear. The opening up of trade regimes in Latin America has recently led to widening wage inequality between the unskilled and skilled labor force. Since the poor are more likely to be unskilled, the export-oriented policy has failed to induce greater benefits to the poor than the rich. On the contrary, the experiences of East Asia have demonstrated that an outward-looking trade strategy has been the engine of their economic success and thus led to rapid poverty reduction over time. Overall, it is hard to establish a firm relation between trade liberalization and poverty reduction, and the causation between the two. This issue should be looked into more carefully depending on individual country experiences.

To a great extent, the paper is in favor of trade liberalization for developing countries, which is a common view including the one shared by many international organizations. However, this view should not underestimate the initial cost the poor might have to bear when the domestic market is liberalized. When a domestic economy opens up to the world economy, many measures prevailing under protectionism naturally have to be lifted. In this process, the poor are more vulnerable compared to the rich. Under a free trade regime, for instance, the prices of tradable commodities in the domestic market become equivalent to that in the world market, thus their prices will naturally rise relative to nonexportable commodities. As a result, the poor will be worse off because they have to pay more for tradable goods but charge less price for nontradable goods. In this respect, the poor are not insulated from trade liberalization.

Osmani also suggests that for developing nations that still heavily rely on the primary agriculture sector, an agriculture-led growth policy works better for poverty reduction. It is generally believed that agricultural development through changes in technology has benefited most of the poor in an absolute sense. This strategy seems to be more effective when the economy does not have high inequality, regional disparity in particular. If the society has uneven regional development, for example in Thailand, then an agriculture-led growth strategy through technical progress and accelerated agricultural commercialization is likely to worsen the existing regional disparity and increase poverty in the society. In order to achieve a more egalitarian society coupled with poverty reduction, an agriculture-led growth strategy should be implemented in a way that regional disparity is narrowed down.

The paper also addresses the significance of pro-poor complementary policies in addition to free trade to reinforce growth and poverty reduction. Land reforms and

education may compensate the poor who are disadvantaged from external shocks such as trade liberalization. As Osmani argues, distributive land reforms rather than collective ones can be more effective in raising the incomes of the poor and thus reducing poverty. This channel can in turn create employment opportunities for the poor who are likely casual and unskilled workers.

Coupled with redistributive land reforms, education can provide an important tool for the poor to expand their employment opportunities and increase their earnings capacity. Hence, a well-targeted educational scheme for the poor is of paramount importance to facilitate the process of poverty reduction. Public goods such as primary education should be provided in a way that the poor in rural areas should benefit much more than middle and upper classes in urban areas. There should be an educational policy whose benefits flow to rural areas and to poor people. This provision of human capital eventually increases productivity of the economy as a whole.

The paper does not touch upon the importance of social safety nets in reducing poverty. Through poverty reduction strategies proposed by Osmani, the poor will mostly benefit from employment creation and improvement in human capital. However, there are always some groups of people who will be left behind, who deserve special attention from government, a social safety net to meet their basic needs on a daily basis. These include the elderly, sick, disabled, and other vulnerable groups. A carefully drafted fiscal policy that considers safety nets for the needy will outweigh the cost that the society has to pay for high poverty in the future.

### **Sectoral Composition of Growth and Poverty Reduction**

The fifth paper by Peter Warr (Warr 2000) explores the relationship between economic growth and poverty reduction in six Asian countries, namely India; Indonesia; Malaysia; Philippines; Taipei China; and Thailand. The analysis is based on time series data covering the period from the 1960s to the 1990s. These economies were chosen for their wide geographical coverage and for the availability of data on aggregate poverty incidence covering a significant number of years.

Warr takes the view that the rate of economic growth is a significant determinant of the rate at which poverty declines over time. However, the effectiveness of growth as an engine of poverty reduction varies from country to country depending on the country's sectoral composition of growth. The main objective of the paper is to test the hypothesis whether the sectoral composition of growth in addition to the rate of growth has an impact on poverty reduction.

The paper shows that the sectoral composition of growth differs considerably among six countries. For instance, agriculture's contribution to overall growth was quite high in Indonesia and Thailand. However, it was low in India; Philippines; and especially Taipei China. If the hypothesis that the sectoral composition of growth

matters for poverty reduction, then the different countries should have different rates of poverty reduction for the same rate of economic growth. To test this hypothesis the following model is estimated:

$$\Delta P = \alpha + \beta (y-n)$$

where  $\Delta P$  is the change in the percentage of poor and  $y$  and  $n$  are the growth rates of aggregate real income and population, respectively. The constant term  $\alpha$  captures the impact of factors other than growth, which also influence change in poverty, while  $\beta$  measures the responsiveness of growth rate of per capita GDP on change in the poverty incidence. The intercept and slope dummies were included in the model in order to take account of the country differences in the sectoral growth rates. The model was estimated using the pooled time series data for different economies.

The regression results showed that the slope coefficient  $\beta$  is negative and significant at the 1 percent level, which is not a surprising result. A high positive correlation between economic growth and poverty reduction has been accepted as a common occurrence. What is surprising in the paper is the result that slope dummies for individual countries are all insignificant. This indicates that the change in poverty incidence for a given rate of economic growth is the same for all six economies. Since six economies vary considerably with respect to their sectoral growth composition, the constancy of the slope coefficient implies that the sectoral composition of growth has no role to play in poverty reduction. Thus, Warr concludes “the overall rate of growth is apparently the overwhelmingly important determinant of the rate of poverty reduction—regardless which sector of the economy actually generates the growth.” This conclusion is at odds with the conventional wisdom that agricultural growth is more pro-poor than growth in industrial and services sectors. If growth is concentrated in sectors from which poor people are more likely to get their incomes, such as agriculture growth, surely such growth will have greater impact on poverty reduction. Osmani in the previous paper advocates an agriculture-led growth policy, which is widely believed to work better for poverty reduction.

Realizing that his conclusion is counterintuitive, Warr rightly pointed out “further research would be needed before any generality could be attributed to result of this kind.” One possible reason for his unconventional result could be that his model did not control for other factors that could influence poverty reduction, which could have created an omitted variable bias. There could have also been a simultaneity bias caused by reverse causality. If Warr’s results are confirmed, their implications are enormous and will surely have an impact on the current thinking about poverty reduction policies.

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# Pro-poor Growth and Pro-growth Poverty Reduction: Meaning, Evidence, and Policy Implications

Robert Eastwood and Michael Lipton

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**Abstract.** *The paper addresses two questions. First, what do regressions reveal about the link from growth to poverty reduction, with differing (i) initial conditions, such as the degree of inequality; and (ii) types of growth, e.g., sectoral balance? Growth on average appears not to redistribute income, pro-poor or antipoor. More interesting is the large cross-country variation; there are hints in a sample of 23 developing countries that: (i) growth may be relatively antipoor in countries that start with high inequality; and (ii) in those countries, agricultural growth may be especially antipoor, a paradoxical finding rejected in country-level studies. The second question is, are there reverse links from asset and income distribution and redistribution to growth? The nature of inequality might matter, ascribed inequality being antigrowth but some achieved inequality pro-growth. Reductions in severe inequality may be particularly pro-growth. High inequality is associated with low elasticity of poverty to growth. In poor countries, pro-poor growth is best stimulated by policies encouraging appropriate technical progress in agriculture, land redistribution, and fertility reduction.*

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## Much Effort and Ingenuity, Little Policy Consensus

**M**any recent papers have explored the links between growth, equality, and poverty reduction. These papers seem comparable. However, many apparent disagreements are due to the differences in either the questions or the methods used to answer them. The questions include: Is growth usually or always good for the poor? Is *more* growth usually or always better for the poor than *less* growth? Does growth tend to reduce (or, at worst, not to

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increase) inequality? Is inequality unimportant in reducing the impact of growth on poverty?

Ideology tends to divide people into those who respond “Yes” to all four of these questions, and those who respond “No” to all four. Yet, first, the right answer to some of these questions may be “No” and to others “Yes”.

Second, some answers probably depend on initial conditions, notably the *level* of income and the *level* and *type* of inequality, as well as the *type* of growth. As for *level*, inequality may be good for growth in high-income countries and bad in low-income ones (Barro 2000). Or growth may be connected to poverty reduction more strongly where the level of initial inequality is low (as in most of Asia) than where it is high (as in most of Latin America) (de Janvry and Sadoulet 2000, Timmer 1997). As for *type*, agricultural growth may be more pro-poor than industrial growth, though perhaps only in more equal and labor-intensive countries, as will be discussed later. Types of inequality based on ascription may be more negative for future growth than types based on achievement, perhaps explaining why the evidence is stronger for growth retardation by high asset inequality than by high income inequality (Deininger and Olinto 2000, Lundberg and Squire 1999).

Third, answers may depend on definitions or methods of measurement. As for *definitions*, the interaction among growth, inequality, and poverty can depend, even in sign, on:

- (i) whether growth is of average GDP or average consumption;
- (ii) whether poverty is (a) relative or absolute, (b) below-poverty-line income or consumption; and
- (iii) whether inequality is defined by a summary statistic such as the Gini, or by the income or consumption share of, say, the poorest quintile of persons.

As for *measurement*, the size or sign of links among growth, inequality, and poverty may depend on:

- (i) whether we measure level and growth of resources per person from household surveys (the only acceptable source of distribution estimates) or from national accounts;
- (ii) whether many observations on levels or changes in poverty, growth and distribution are available for some countries (e.g., India, Republic of Korea) but none or few for others; especially if the better represented countries are atypical in population, gross domestic product (GDP), or poverty incidence, such “multiple counting” may distort regression estimates based on cross-country data;

- (iii) whether per-person annual resource flows, distribution, and poverty are compared for single observations (levels) or for differences between successive observations (spells); and
- (iv) whether observations that are only one or two years apart, and thus more likely to reflect shocks rather than growth, are included.

This paper, while trying to allow for these problems, confirms that poverty decline tends, on average, to be faster when growth is faster; and that there is no general or universal tendency for growth, as such, to make income distribution either less or more equal. Beyond this, the aggregate findings are often conflicting, yet there are useful disaggregated findings. For example, *how* pro-poor growth is, depends on its sectoral balance (e.g., agricultural or industrial) and its demographic correlates (fertility and age-structure transition).

The second section explores the methods and results of some main contributions to the debate about how growth affects poverty. We show that the above problems of definition and measurement indeed hamper interpretation of the aggregate evidence. In particular there is excessive concentration on growth–poverty relationships across the entire sample—often a sample including developed, transitional, and developing countries—rather than on particular types of country, or of policy regime.

Suppose the aggregate cross-section analyses prove that (for example) faster growth of mean GDP translates *for developing countries as a whole* into proportionately faster growth in the income of the poor, but that there is a large scatter of observations above and below the regression surface. Typically, international variance in mean GDP, income, or consumption (or their growth) appears to “cause” some 35-45 percent of variance in poverty (or its rate of decline) (Ravallion 1995, Lipton 1998). This leaves ample scope for growth to be made more, or less, pro-poor—though it remains an open question whether the “scope” is taken up by initial conditions (from initial income distribution to geography), or is available for national policies. A poverty-oriented national policy analyst needs to know: *in my (type of) country and period*, (i) will growth have a specially favorable or unfavorable effect on poverty reduction; and (ii) what can policy do about types of growth, or about the poor or their response to growth of various types to improve that effect?

Hence the third and concluding section suggests how a less aggregated, more micro-based and causally structured analysis of pro-poor growth might help policymakers, *with respect to particular types of initial conditions and/or countries*, to choose policy mixes that speed up growth and poverty reduction (both properly defined). Probably, this means selecting policies that improve the responsiveness of each goal to changes in the other goal and identifying *paths* via which changes in growth rates affect changes in rates of poverty reduction, and vice versa. In low-income areas, where poverty is concentrated, there is tentative evidence that a *given*

rate of economic medium-term growth reduces poverty most if focused on (i) increasing staple food production and farm employment, and (ii) providing incentives and enabling devices that reduce fertility, especially among the poor.

As will be argued in this final section, a pro-poor growth path is not fully distinguishable, analytically or empirically, from a pro-growth path of poverty reduction or of low-end equalization. The latter is probably most pro-growth if it focuses on redistributing land and educational assets, and, more generally, if it targets *ascribed* inequality more than (but not ignoring) *achieved* inequality.

### **Pro-poor Growth: What Do the Data Tell Us?**

#### **Measuring Poverty**

Analysts may reach different conclusions about how “pro-poor” growth is, or about the effect of distribution upon this, because they use different indicators of poverty. Characteristics of the indicators, or distortions of these indicators in the sources, can cause such conclusions to overstate or to reverse the genuine relationships among growth, distribution, and poverty.

##### *Incidence/Intensity/Severity*

de Janvry and Sadoulet (2000) and many others estimate the impact of growth on poverty incidence only. This does not allow for depth of poverty, nor distribution below the poverty line.

##### *Dollar or National Poverty Lines, or Relative Poverty?*

Purchasing-power-parity (PPP) dollar poverty is used in international comparisons of poverty by Ravallion and others. Like them, de Janvry and Sadoulet assess the impact of growth on absolute poverty, but measure this with national poverty lines, which not only vary among countries, but tend to increase with mean national consumption. National poverty lines may make it hard to interpret cross-national regressions where “national poverty incidence” is the dependent variable, if “poverty” refers to very different command over resources in different countries.

Measures of “relative” poverty set the poverty line at a given proportion, typically half or a third, of *national* mean or median income or consumption. A body of recent work (i.e., Gugerty and Timmer 1999; Gallup, Radelet, and Warner 1998; and Timmer 1997) at the Harvard Institute for International Development (HIID) and the World Bank takes off from this definition, and in effect defines “poverty” as “low share of income of the worst-off 20 percent in any given country.” The incidence of

“HIID-poverty” can never vary (it is always 20 percent), though its intensity and severity can change or vary. It is this varying/changing “intensity of HIID-poverty” that this work seeks to explain, in particular by estimating the “elasticity of connection”, i.e., the elasticity of the mean income of the bottom quintile to national mean income.

*Consumption or Income?*

There are familiar reasons to prefer a consumption-based poverty line, yet most of the “elasticity-of-connection” literature uses income, calculated in a roundabout way described below.

*Per Person or Equivalent Adult, or Per Household*

Per-household income or consumption estimates tell us little or nothing about per-person welfare or poverty. It is not clear in some data sets, especially for Latin America, whether per-household data are used.

**Unreconciled Sources: Household Surveys/National Accounts/Penn;  
Consumption/Income/GDP**

Datt and Ravallion (1992, 1995, 1998a, 1998b) on India estimate mean consumption and its growth, as well as poverty and distribution, from household surveys (the Indian National Sample Survey), and this team often uses similar methods in cross-country comparisons (but adjusting from national to PPP dollar poverty lines) (e.g., Ravallion 1997, Chen and Ravallion 2001). This avoids difficulties that can arise when household surveys are mixed with other data sources. However, such mixing does answer the question that concerns most people about growth and poverty: how different rates or paths of, or policies or external events affecting national growth—presumably of domestic or national product per person—affect poverty; and how distribution plays a role in this. To address that, the standard procedure is to estimate poverty and distribution from household surveys of consumption or disposable income, and growth, usually of GDP, from national accounts.<sup>1</sup>

However, (i) GDP exceeds personal disposable income, which in turn exceeds personal consumption; (ii) GDP distribution is not well-defined and personal

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<sup>1</sup>Often (though not in de Janvry and Sadoulet), Penn World Tables are used to convert, into constant (PPP) command over a global mean consumption bundle, country national accounts GDP, and/or country household survey measures of poverty. Since PPP estimates exist only for national accounts totals (or per-person means), the latter conversion assumes that if the quantity of the global mean consumption bundle that (say) a particular resident of rural India could buy at local (in fact all-India average) prices is the same as the quantity that can be bought by some individual in (say) the United Kingdom, then those two individuals are equally well-off.

disposable income distribution is much more unequal than consumption distribution; (iii) typically, survey consumption and income in developing countries are respectively 15-40 percent and 20-50 percent below national accounts estimates, because the richest seldom take part in household surveys. This does not impede surveys from measuring absolute poverty, but does damage survey measures of distribution, relative poverty, and the income or consumption share (or growth) of the poorest quintile, because of underestimates of top-quintile income and consumption. These are probably highly variable over time: e.g., in India the gap between mean consumption estimates from the National Sample Survey and the national accounts increased sharply in the 1990s. Most doubtful is the practice of regressing household survey distribution or poverty data (based on surveyed disposable income or consumption) on much more inclusive national-accounts data for consumption, or, worse, GDP, at the mean. The problem is that multiplying the bottom quintile's share of consumption by mean GDP does not produce a measure of anything, let alone anything accruing to the bottom quintile.

Some studies (among them the HIID and World Bank work reviewed in the next section) use PPP income and growth data but do not correct household distributions for PPP differences among quintiles because no conversion data are available. This could make a big difference to inequality measures (presumably reducing them for low-income countries).

### **The “Elasticity of Connection”**

Nevertheless, increased availability of internationally comparable data on (i) national-accounts aggregates such as GDP/capita (Penn World Tables) and (ii) the distribution of income (household surveys reviewed by Deininger and Squire 1996) has led to considerable research on what Timmer calls the *elasticity of connection* linking the mean income of the poor to national mean income. The principal papers are Dollar and Kraay (2000) and three from HIID: Gugerty and Timmer (1999); Gallup, Radelet, and Warner (1998); and Timmer (1997). For reasons of data availability, the poor in each of these papers are defined as those in the bottom quintile of the income/consumption distribution as measured through household surveys judged of adequate quality according to the criteria of Deininger and Squire. Similarly, the distinction between GDP/head and mean household income or expenditure is ignored, so that, for instance, bottom quintile mean income is estimated directly from the income/consumption share of the bottom quintile and the Penn World Tables estimate of GDP/capita.<sup>2</sup>

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<sup>2</sup>Note that serious biases could arise from nonrandom variations over time—and, in models without country effects (fixed or random), across countries—in the distribution, across quintiles, of benefits from nonconsumption GDP. Another potential source of bias is the systematic difference between the shares of the bottom quintile in

One may simply posit a relation of the form:

$$ly1_{it} = a + b.ly_{it} + m_i + d_t D_t + e_{it} \quad (1)$$

Here  $i$  and  $t$  refer to countries and years;  $ly1$  is the natural log of bottom quintile mean income;  $ly$  is the natural log of national mean income;  $m$  is a country fixed effect; the  $D_t$  are time dummies;  $a$ ,  $b$ , and  $d_t$  are coefficients to be estimated; and  $b$  is the elasticity of connection. If  $b$ , the elasticity of connection, equals one, then other things being equal, a 1 percent rise in national income per head is causing a 1 percent increase in bottom-quintile income per head.  $e_{it}$  is an error term, the assumed properties of which vary among the studies.

Equation (1) is a “levels” equation, a “growth” equation can readily be derived from it by differencing, viz:

$$ly1_{it} - ly1_{it^*} = b(ly_{it} - ly_{it^*}) + (d_t D_t - d_{t^*} D_{t^*}) + (e_{it} - e_{it^*}) \quad (2)$$

If we can assume exogenous regressors measured without error and identically independently distributed  $e_{it}$ , ordinary least squares (OLS) estimation of either the levels equation with country dummies or the growth equation will yield an unbiased (and consistent) estimate of  $b$ . Further, use of the levels equation will be preferred on efficiency grounds, since the serial correlation of the error term in (2) means that OLS estimates will be inefficient in this case.

Endogeneity of mean income, measurement errors, and omitted variables can each mean that OLS on equations (1) or (2) will yield inconsistent estimates and serial correlation of the  $e_{it}$  can make matters worse.

### *Endogeneity of $y$*

Endogeneity of  $y$  may give rise to asymptotic least squares bias either because of reverse causation from  $y1$  to  $y$  or because the process determining  $y$  contains an error term correlated with  $e$  (a form of joint causation). Note that reverse causation will generate such bias even if  $y$  depends only on lagged  $y1$  unless the errors in the estimating equation, whether a levels or differences version, are serially independent.<sup>3</sup> It is noteworthy that Dollar and Kraay in fact assume serial independence of  $e_{it}$ , so the reverse causation that they discuss would not have prevented them from obtaining a consistent estimate of  $b$  from OLS on a levels equation like equation (1). That they use a more complex Generalized Method of Moments (GMM) technique is

income and consumption. Dollar and Kraay, but not the HIID papers, correct for this using the Zhou-Deininger-Squire correction (reported in Lundberg and Squire 1999).

<sup>3</sup>This is because consistency requires that the regressor and the error term be uncorrelated. In the levels equation, for instance, serial correlation of  $e_{it}$  implies that correlation between  $y_{it}$  and lagged  $e_{it}$  generates correlation between  $y_{it}$  and current  $e_{it}$ .



because they want to identify effects on  $y_1$  arising from time-invariant policy-related variables (Dollar and Kraay 2000, 15) and this is impossible in the fixed effects framework of equation (1), since the effects of all time-invariant variables are swallowed up in the fixed effects.

To summarize, reverse causation from  $y_1$  to  $y$  will necessarily cause OLS estimates to be inconsistent unless this causation operates with a lag. Then inconsistency will still arise if the error terms in the estimating equation are serially correlated. Suppose for a moment that the  $e_{it}$  are serially independent. Then the error terms in equation (2) are necessarily serially correlated, and there is accordingly a good reason to work with equation (1) instead. Conversely, it might be that  $e_{it}$  is a random walk. Then exactly the converse conclusion would hold. Finally, suppose that there is serial correlation in  $e_{it}$  that dies away over time. Then inconsistency will be reduced (but not removed) by the use of relatively widely spaced data points.

Joint causation is discussed in Timmer (1997). He explains his preference for estimation in levels rather than in differences as follows. Suppose that  $y$  is trended and subject to shocks and  $y_1$  is not trended but is subject to exactly the same shocks as  $y$ . There are no causal links between  $y$  and  $y_1$ . Clearly the common shocks will set up a correlation between  $y$  and  $y_1$ , but in Timmer’s view this short term “connection” is masking the fact that  $y$  and  $y_1$  are in fact wholly “disconnected” from a longer-term perspective. Thus inappropriate methods will lead to an overestimate of the elasticity of connection, here zero by definition. Formally, we can represent this line of reasoning using the following system:

$$y_t = a + bt + e_t \tag{3}$$

$$y1_t = d + fy_t + u_t \tag{4}$$

where variables are as in equations (1) and (2). In addition,  $t$  is time,  $f$  is a constant and  $u_t$  is an error term. The reduced form for  $y_1$  is therefore:

$$y1_t = (d + fa) + fbt + (fe_t + u_t) \tag{5}$$

Differencing equations (3) to (5)

$$\Delta y_t = b + \Delta e_t \tag{6}$$

$$\Delta y1_t = f\Delta y_t + \Delta u_t \tag{7}$$

$$\Delta y1_t = fb + (f\Delta e_t + \Delta u_t) \tag{8}$$

$f$  is the elasticity of connection. Suppose we decide to estimate this using the differenced form in equation (7). The OLS estimator,  $f_{OLS}$ , is given by:

$$f_{OLS} = f + s \text{cov}(\Delta y_t, \Delta u_t) / s \text{var}(\Delta y_t) = f + s \text{cov}(\Delta e_t, \Delta u_t) / s \text{var}(\Delta e_t) \quad (9)$$

where *scov* and *svar* mean sample covariance and sample variance, respectively.

Evidently, if the errors *u* and *e* are equal to one another, this reduces to  $f_{OLS} = (f+1)$ .

In particular,  $f=0$  implies  $f_{OLS} = 1$ , Timmer’s striking example.

Suppose instead that we do a levels regression, i.e., OLS on equation (4). It is easily shown for this case that:

$$f_{OLS} = f + [\Sigma(u - \underline{u})(y - \underline{y})] / \Sigma(y - \underline{y})^2 \quad (10)$$

$$= f + [\Sigma(u - \underline{u})(e - \underline{e})] / \Sigma(y - \underline{y})^2 + b[\Sigma(u - \underline{u})(t - \underline{t})] / \Sigma(y - \underline{y})^2$$

where underlined variables are sample means.

Since *y* is assumed to be trended and *u* and *e* are assumed zero-mean serially independent variables with a given covariance matrix, it is evident from equation (10) that the probability limit (plim) of  $f_{OLS}$  is just equal to *f*, i.e., OLS is consistent in this case.<sup>4</sup> A nontechnical way of seeing this is to observe that, to the extent that  $f_{OLS}$  differs from *f*, the trend in equation (3) is going to “infect” the residuals in equation (4). A least-squares procedure is going, in the limit, to prevent this from happening.

At this point we have just formalized Timmer’s argument, with a little extra generality. Estimation in differences will grossly overestimate the elasticity of connection, but estimation in levels avoids the problem. However, the reason for this result is instructive. The above proof of consistency is *entirely dependent* on the assumption that *y* is trended. But in his empirical work, Timmer adds country fixed effects together with time dummies (i.e., using equation [1]). This removes global trends from the data, while retaining country-specific trends. What estimation in this case amounts to is OLS on equation (1), except that both *y* and *y*<sub>1</sub> have had both country and time effects purged from them before estimation.<sup>5</sup> Therefore the proof of consistency given above ceases to be valid. Positive covariance between *u* and *e* will lead to upward asymptotic least squares bias, i.e., systematic overstatement of the benefits of growth to the poor, just as it does when estimation is carried out on the equation in difference form.

How can this problem be tackled? One approach would entail looking for suitable instruments for *y* in (1) (or for  $\Delta y$  in (2)). But it is hard to think of variables that are correlated with *y* (or  $\Delta y$ ), yet can be assumed uncorrelated with the error

<sup>4</sup>The point is that the plim of  $(1/T)\Sigma(y-y)^2$  goes to infinity, while the plims of the top lines are bounded.

<sup>5</sup>So a variable  $z_{it}$  is transformed into  $z^*_{it} = z_{it} - z_i - z_t + z$ , where the three underlined variables are the mean over time for a given country, the mean over countries at a given date, and the global mean of *z*.

term in (1) (or (2)). Another possibility is to use only quite widely spaced data points. Under certain assumptions about  $u$  and  $e$ , this will reduce asymptotic bias in OLS estimates of the differenced version of the model. Suppose, for instance, that we assume that  $u$  is serially independent while  $e$  is made up of a temporary shock,  $u$  itself (say), and a permanent random walk component, perhaps reflecting permanent technology shocks. Thus:  $u$  has mean 0 and variance  $\sigma_u^2$ ;  $e = u + v$ ;  $\Delta v$  has mean zero and variance  $\sigma_v^2$ ;  $Cov(u,v)=0$ .

Now the plim of the bias term in the expression for the OLS estimate of  $f$  in the difference formulation (7) is:

$$Asy\ bias = plim (scov(\Delta e_t, \Delta u_t)/svar(\Delta e_t)) = 2\sigma_u^2/(2\sigma_u^2 + \sigma_v^2) \tag{11}$$

This assumes a one period gap between data points. Clearly, as we increase the number of years between data points from one, the asymptotic bias is reduced, because a  $T^2$  gets in front of the term  $\sigma_v^2$ . Intuitively, the permanent component of  $e$  is getting more important relative to the temporary component, reducing the troublesome asymptotic bias term.

The interim conclusions are that (i) Timmer’s claim that levels regressions are superior to difference regressions is wrong when time dummies are in use, and (ii) if  $y$  but not  $y1$  is subject to permanent shocks, then for the differenced version of the model the asymptotic bias that arises from covariance of the temporary shocks can be reduced by wide spacing of the data points.

### *Measurement Errors*

When only a regressor is measured with error, OLS generates downward asymptotic bias in its parameter estimate; measurement error in just the dependent variable does not create such bias (Greene 1990, 295). Here, it must be considered that  $ly1$  is constructed from  $ly$  together with an estimate of the bottom quintile income or consumption share.<sup>6</sup> Measurement error in just the bottom quintile share thus generates measurement error in  $ly1$ , and so reduces the precision of the estimated elasticity of connection without introducing asymptotic bias. Measurement error in just  $ly$ , however, generates an *equal* error in  $ly1$ . The effects are therefore exactly the same as the effects of the Timmerian shocks analyzed in the preceding section.

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<sup>6</sup> $ly1$  is constructed as  $ly$  plus the natural logarithm of the bottom quintile share minus the natural logarithm of 0.2.

*Omitted Variables*

Omitted variables that are correlated with included regressors give rise to OLS bias. Either first differencing or the inclusion of fixed country effects will eliminate the part of this bias that arises from time-invariant but country-dependent omitted variables, and indeed constitutes the main reason for using one or other of these techniques.

*Results*

We now present the results that we and others have obtained on the elasticity of connection. We consider two general questions. First, considering the elasticity of connection between national mean income and first quartile mean income, are there any generalizations that are robust to sample disaggregation by time period or category of country (rich versus poor, high versus low inequality, one region versus another)? Second, what can be said about the connection between growth in particular sectors and growth in first quintile mean income? For the first question, we review the work of Dollar and Kraay (2000) and Gugerty and Timmer (1999) (which largely subsumes Gallup, Radelet, and Warner 1998). For the second, we refer to Timmer's analysis of agriculture versus nonagriculture and our own analysis of his data set, as well as to country studies on the link from sector-specific growth to *poverty* (the distinction between "larger first-quintile mean income" and "poverty reduction" must not be forgotten here).

The results on our first question are summarized in Table 1. Dollar and Kraay (row 1) use all countries with data on first quintile income or expenditure shares. They address the problem of data periodicity by requiring gaps between data points selected to be a minimum of 5 years, starting with the first available observation. Their data suggest that the elasticity of connection is close to +1 for their sample as a whole and for subsamples constructed by separating countries into rich and poor ones (the cutoff is not specified), and also by separating 1960-1980 from 1981-2000.<sup>7</sup> Despite the range of robustness checks carried out, questions inevitably remain, as Dollar and Kraay acknowledge. For instance, the very sharp rises in inequality together with falls in GDP/capita in the transition countries in the 1990s might be so special, e.g., to certain widespread errors in managing the transition process (Milanovic 1999a), as to make it inappropriate to include these episodes in the data set. In any case, their (presumed<sup>8</sup>) inclusion must have pushed up the estimate of the elasticity of connection.

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<sup>7</sup>Certain other sample splits are tried as well.

<sup>8</sup>Dollar and Kraay do not include a list of countries and dates, so we cannot be certain how many observations are included from the transitional economies.

The HIID research produces results (for example, see rows 2 and 3) consistent with Dollar and Kraay as regards the global sample. Whether the regression is run in growth or level form, and whether decadal dummies are included or not, we get an estimated elasticity of connection not too far from +1. Although the use in the levels versions of decadal dummies (row 2) and splitting the sample into pre-1980 and post-1980 (row 1) lowers the point estimates of the elasticity, the falls here are not significant.

The remainder of Table 1 reports results that we have obtained using Timmer's (1997) data set. He obtains his sample of 27 developing countries by requiring that they pass his "relevance test" (Timmer 1997, 3), viz: population "reasonably" large; significant agricultural sector in terms of both output and employment share; "reasonably representative of the developing world". The results in Table 1 are similar to Timmer's but, in line with the research reported above, we have filtered his data using Dollar and Kraay's procedure, except that we have set the minimum gap at 4 rather than 5 years, so that we have 94 observations on 23 countries (Timmer's full sample has 191 observations on 27 countries). That apart, we have, for reasons explained earlier, not restricted ourselves, as Timmer does, to estimation in levels.

In rows 4-5 we find some evidence for the Timmer sample (selected from low-income and middle-income countries, excluding transitional economies) to have less impact on the poorest quintile, from mean income growth, than for global samples and for time effects. The latter effects are significant only in the regressions estimated in levels, where they pull down the estimated elasticity appreciably to around 0.60-0.65.<sup>9</sup> This raises the possibility that estimates without time dummies are confounding cross-section and time-series information in an unhelpful way. Suppose for example that a given decade saw both generally rapid growth and a general improvement in income distribution (resulting perhaps from some global trend such as trade liberalization). This would produce the observed difference, but for most purposes, it would be the lower "cross-section" estimate that would be of interest.

In rows 6-7 we ask whether the elasticity of connection depends on initial inequality. Following Timmer, we define inequality in terms of "relgap": the ratio of (top quintile mean income minus bottom quintile mean income) to national mean income, and define an inequality dummy that takes the value +1 for countries for which relgap exceeds +2 on average and the value 0 for the remainder. Both the level and difference regressions give some indication that the poor do less well out of growth in more unequal countries, although this finding is significant only for the difference estimation (row 7).<sup>10</sup>

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<sup>9</sup>Timmer placed relatively little weight on this finding, since it is much less apparent in his full sample. For reasons that are not clear to us, the time dummies pull in the opposite direction (but with very low significance) when estimation is in differences.

<sup>10</sup>An alternative procedure is to interact relgap itself, rather than a dummy based on it, with the level (or difference) of log mean income. Similar results are obtained; details are available from the authors.

Table 1: **The Elasticity of Connection without Sectoral Disaggregation**

Row	Source	Sample	Levels or Growth	Inequality Dummy	Elasticity	Comments
1	Dollar and Kraay Table 3	Global. 236 observations on 80 countries. Post-1960. Intervals at least 5 years.	Mixed (GMM procedure)	No	1.046 (0.102)	Splitting the sample into 1960-1980 and 1980-2000 yields elasticity estimates of 1.01 and 1.017 (standard errors about 0.08): Dollar and Kraay (2000, Table 4).
2	Gugerty and Timmer Appendix B Table 2	Global. At least 488 observations on 69 countries. See comments column.	Levels	No	0.979 (0.026)	With decadal dummies elasticity estimate falls to 0.934(0.042). The sample is based on 488 intervals or 2.7 years long on average.
3	Gugerty and Timmer Appendix B Table 1	Global. Intervals at least 5 years. Number of observations and countries not reported.	Growth	No	1.11 (0.096)	If instead the maximum number of intervals (488) permitted by the data is used, the results are almost identical.
4	Eastwood and Lipton	Timmer. 94 observations on 23 developing countries (see text). Intervals at least 4 years.	Levels	No	0.90 (0.08)	Significantly lower estimates with time dummies: decadal 0.64(0.12), annual 0.61(0.14). We and Timmer (1997) get higher estimates (around 0.80) using his full sample of 191 observations.
5	Eastwood and Lipton	Timmer. 71 observations on 23 countries. Intervals at least 4 years.	Growth	No	0.76 (0.20)	Insignificantly higher estimates with time dummies: decadal 0.84(0.20), annual 1.02(0.37).
6	Eastwood and Lipton	Timmer. 94 observations on 23 countries. Intervals at least 4 years.	Levels	Yes	1.02 (0.11) equal countries	Inequality dummy: -0.23(0.16), so that the point estimate of the elasticity for the unequal group of countries is 0.79. Lower estimates with time dummies; for equal countries and decadal dummies 0.76(0.14); annual dummies 0.66(0.15). The coefficient on the inequality dummy is hardly affected.
7	Eastwood and Lipton	Timmer. 71 observations on 23 countries. Intervals at least 4 years.	Growth	Yes	0.98 (0.21) equal countries	Inequality dummy: -0.71(0.28), as in row 6. The use of time dummies raises the equal countries estimate a little and hardly affects the inequality dummy coefficient.

GMM means Generalized Method of Moments.

Note: For a regression that is apparently similar to that of row 5, Gugerty and Timmer (1999, Appendix B Table 1) report an estimated elasticity of 1.18(0.17). We cannot account for the discrepancy, although they and we do not use identical procedures to thin out the sample.

We now turn to the main point of Timmer's paper: how the results just outlined are affected if we disaggregate the economy into the agricultural and nonagricultural sectors, keeping the distinction between relatively equal and relatively unequal countries. Here we depart from Timmer: we continue to estimate both the level and difference forms of the regression, and we weight the sectors using a different procedure than his. Nevertheless we confirm Timmer's surprising result: across observations from unequal developing countries, labor productivity growth in agriculture seems even less useful for the poor than in other sectors.

To get at this issue statistically, it helps to use the following identity. We neglect throughout the distinction between the population and the working population.<sup>11</sup>

$$\Delta \ln(y) = S_{YAG} \Delta \ln(y_{AG}) + S_{YNAG} \Delta \ln(y_{NAG}) + \{(y_{NAG} - y_{AG})/y\} \Delta l_{NAG} \quad (12)$$

This says that growth in income per head can be broken up into three components: growth in labor productivity in agriculture, weighted by its share in output; the same for nonagriculture; a term reflecting the change in the share of the labor force working in nonagriculture. Note that the third term is positive when nonagricultural labor productivity exceeds agricultural labor productivity and the labor share of nonagriculture rises.

For *difference* regressions, therefore, we estimate this identity modified by putting  $\Delta \ln(y)$  on the left hand side. For *level* regressions, care is needed. Now, in identity (12), the delta is to be interpreted as a deviation from the country mean. Thus, to obtain the appropriate regressors, one must take the deviation from the country mean, for instance, of  $\ln(y_{AG})$  and then weight it by the country average of  $S_{YAG}$ , as opposed to taking the difference in the weighted  $\ln(y_{AG})$ .<sup>12</sup> In each case, the null hypothesis would entail coefficients of +1 on each regressor. The meaning of this null is that, under it, mean income growth arising (arithmetically) from whatever source (a rise in labor productivity in agriculture, a rise in labor productivity in nonagriculture, or a shift of labor toward the more productive sector) would have the same effect on first quintile mean income.

The results obtained are shown in Table 2, though any conclusions have to be tentative because the standard errors of the estimates are generally rather high. Rows 1 and 3 show level and difference versions of the model without considering cross-country inequality variations. The coefficients are not well-determined and no clear

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<sup>11</sup>This simplification is potentially serious because (i) rapid workforce productivity growth in either sector might have arisen from shedding workers into lower (or zero) income activities (see discussion on impact of IC distribution on growth below); and (ii) proportions of population of workforce age, e.g., 15-59, are changing (rising) very fast in many developing countries, much more so for nonrural and nonpoor people (Eastwood and Lipton 1999).

<sup>12</sup>Here we part company from Timmer's procedure. He appears to use a different weighting scheme to construct his regressors, and he does not include the labor force shift term.

conclusions can be drawn. In rows 2 and 4 we allow the elasticity of connection to productivity growth in each sector to depend on inequality, using Timmer's inequality dummy in the same way as in Table 1.<sup>13</sup> Once again, the standard errors are high, yet Timmer's conclusion does receive some support, that in unequal countries there may be almost complete disconnection between productivity growth in agriculture and the income of the poorest quintile. The point estimates (obtained by adding the estimates in columns 3 and 4 in rows 2 and 4) suggest a *negative* connection for these countries. In the levels regression, the hypothesis of an elasticity of connection of +1 cannot be rejected ( $p=0.14$ ), but in the growth regression it is rejected decisively, despite the high standard errors ( $p=0.02$ ). For nonagriculture the point estimates are at least positive, but once again they suggest disconnection of the poor in unequal countries (the  $p$  values associated with the null being 0.01 and 0.06 for the level and difference formulations respectively).<sup>14</sup>

What do the coefficients on the sectoral labor shares correction terms mean? If the dependent variable is the growth in mean income rather than the growth in bottom quintile mean income, then these coefficients are necessarily +1, since this regressor is picking up the mechanical effect on income per head of labor movement toward the more productive sector. So coefficients greater than +1 mean that such labor movements have an additional positive effect on first quintile income per head. A variety of circumstances could produce this finding, for example, income being more equally distributed in nonagriculture than in agriculture.

What other evidence do we have on the impact of sectoral growth on the poor in developing countries, especially in those with high inequality, and how does such evidence fit in with the above results? Thorbecke and Jung (1996) used a Social Accounting Matrix (SAM) for Indonesia to address this question and found that employment effects, both direct and arising from intersectoral linkages, accounted for most differences across sectors in the poverty impact of growth, and that agricultural growth was the most pro-poor of all. Datt and Ravallion (1998a,b), using regression methods instead of SAM-based simulations, provide an even more striking result for India: over places and times, faster agricultural growth is substantially beneficial for both rural and urban poverty reduction, services growth moderately so, and industrial growth ineffectual. These results are consistent with Timmer's hypothesis, since Indonesia and India have relatively low inequality (indeed are among the low-inequality countries in Timmer's sample).

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<sup>13</sup>In principle it might be preferable to use a sector-specific inequality indicator, such as the Gini of agricultural land inequality, rather than the national indicator used by Timmer.

<sup>14</sup>Qualitatively similar results are obtained if time dummies are used, but standard errors are high.



**Table 2: Inequality, Sectoral Growth, and the Elasticity of Connection<sup>a</sup>**

Row	Levels or Growth?	Agriculture Sector Elasticity	Agriculture Sector Inequality Dummy	Nonagriculture Sector Elasticity	Nonagriculture Sector Inequality Dummy	Sectoral Labor Shares Correction Term
1	Levels	0.86 (0.60)		0.69 (0.20)		1.46 (0.34)
2	Levels	1.83 (0.89)	-1.90 (1.13)	0.63 (0.27)	-0.38 (0.37)	1.95 (0.35)
3	Growth	1.22 (0.69)		0.55 (0.27)		1.69 (1.20)
4	Growth	2.21 (0.73)	-4.12 (1.41)	0.49 (0.31)	-0.23 (0.49)	2.17 (1.12)

<sup>a</sup>Timmer sample with 4 year gaps, as in Table 1.

Note: F tests of the hypotheses that in the unequal countries the elasticity of connection equals +1 give results as follows: levels equation (row 2): p-value for agriculture = 0.14, p-value for nonagriculture = 0.01; growth equation: p-value for agriculture = 0.02, p-value for nonagriculture = 0.06

As regards high-inequality countries, Khan (1999) applies Thorbecke and Jung’s methods to South Africa, one of the world’s most unequal countries (and agricultures), and finds that growth produces the greatest poverty reduction if it is agricultural. For one of Asia’s most unequal countries, Kakwani (2001) using a different methodology based on the Philippines’s 1998 Annual Poverty Indicators Survey estimates the elasticity of the poverty gap ratio at -1.12 with respect to agricultural growth, but only -0.34 for services growth, and -0.25 for industrial growth. However, an analysis of growth spells for a group of countries in a region with income or consumption Ginis mostly well above the developing-country average, Latin America, confirms that neither agricultural nor industrial growth, but only service sector growth, produces statistically significant benefits for either the urban or the rural poor (de Janvry and Sadoulet 2000, 278, 280.<sup>15</sup>, though the use of very different national poverty lines for cross-country estimation of determinants of poverty change may affect the reliability of these results. A study (Bourguignon and Morrisson 1998) confined to small and medium developing countries showed the same result as the single-country studies: agricultural growth is most pro-poor.

It is paradoxical, for Economics 101 reasons reviewed later in the third section, if in low-income countries agriculture—producing local cheap food and labor-intensive at the margin compared to other sectors—generates antipoor rather than pro-poor growth, even in “unequal” countries. We later suggest reasons why some researchers, known to us *not* to be disposed toward this paradoxical finding, have

<sup>15</sup>de Janvry and Sadoulet find that mean income growth reduces urban and rural (national absolute) poverty incidence significantly only in the initially less-unequal growth spells, again echoing Timmer’s finding about the elasticity of connection.

reached it. At this point, we note that all the studies in *individual* low-income countries, whether regressions or SAM-based simulations, appear to confirm the “common sense” expectation that agricultural growth is more pro-poor than nonagricultural growth. Perhaps the contrary results, sometimes observed in *cross-national* data analyses of “unequal” developing countries, are due in part to problems of method.

### **Growth–Poverty Relationships Overall, or for Particular Types of Country or Policy Régime?**

Dollar and Kraay claim that their data show no decline, over time, in the capacity of growth to raise mean income of the poorest quintile the set of observed growth spells taken together. This *very probably* means that faster national mean-GDP growth is as good as ever at cutting relative poverty. However, we cannot be at all sure that this conclusion applies to impact on absolute poverty overall, or to any poverty indicator in a specific country. A fortiori we cannot assert a nondeclining absolute poverty impact of growth in a particular country. For example, that impact in India was less in 1992-1997 than in 1975-90.<sup>16</sup> In the People’s Republic of China (PRC) it was enormous in 1977-1984 alongside land reform *and* substantial price liberalization *and* very fast agricultural growth based on technical progress. It was much smaller in 1984-1993 and 1996-1998 despite fast growth; and almost certainly much overestimated in 1993-1996 (when allegedly 140 million Chinese transcended the PPP dollar poverty line).<sup>17</sup> Since PRC and India contain over half the world’s absolute poor, only in a special sense is it correct to claim no decline in the poverty impact of growth. One issue here is the appropriateness from an econometric viewpoint of using the country as the unit of observation, paying no attention to variations in country size, however measured. It can be shown (Blanchet 1998) that if the “true” model applies to (statistically independent) subnational regions rather than countries, and if national data are constructed as weighted averages of regional data, then cross-national heteroscedasticity is the result. Efficient estimation then requires that large countries be given higher regression weights.<sup>18</sup>

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<sup>16</sup>There was no growth or poverty reduction in India over 1990-1992, or indeed over 1960-1975, at PPP.

<sup>17</sup>Everyone knows these data are odd; almost nobody suggests they are falsified; but there is disagreement on what is wrong. It may have to do with declassifying or undercounting poor rural-to-urban migrants in 1996.

<sup>18</sup>Typically it turns out that country observations should be weighted by the square root of population.

### **What Sorts of Growth, Poverty Reduction, and Inequality Reduction Promote Each Other?**

We have reviewed cross-national regressions claiming to show how levels (or changes) of poverty—or of the income of the poor—are affected by levels (or changes) of mean income, and how these relationships are affected by initial income distribution. Further, we have juxtaposed the findings with those of single-country simulations and regression-based studies. This final section:

- i. Summarizes the above aggregate evidence on how growth affects income or consumption (IC) distribution, and hence and otherwise, poverty.
- ii. Reviews the reverse causal sequence: how *initial* IC distribution affects growth (and the impact of such growth on poverty); whether it is asset or IC distribution that is at work; and impact of *redistribution* on growth and, hence and otherwise, on poverty. This is important, although we have so far focused on the effect of growth on distribution and poverty. If favorable, that effect may be greatly amplified by positive feedback—or attenuated by negative feedback—from reduced poverty (or greater equality) to growth.
- iii. Presents an Economics 101 view of what *types* of growth might be relatively *bad* for poverty reduction in developing countries, and juxtaposes it with the discussion in the second section above of the relative role of agricultural and other growth in poverty reduction.
- iv. Asks if the effect of redistribution on growth and poverty reduction might depend on whether inequality is very high, normal, or very low; and ascribed or achieved.
- v. Explores, in view of the above sections, the differences they reveal between developing and developed countries (and among developing countries), and possible cumulative causation, i.e., what country characteristics, policy types, or events might stimulate sequences of faster growth, moderate or reduced inequality, and faster poverty reduction. We suggest three “pro-poor growth” policy emphases: on food staples production, especially via faster, employment-intensive technical progress; on land redistribution; and on fertility reduction.

**Summary: Impact of Growth on Distribution, and Hence and Otherwise, on Poverty**

Did anyone ever believe that stagnation of mean income was *in general* better for the poor than growth, or slow growth than fast? That view is challenged by international cross-sections, but the Dollar and Kraay and HIID evidence shows only a positive impact of *mean GDP from national accounts* on *mean surveyed income of the poorest quintile*. The latter is an uneasy mixture of relative poverty and low-end inequality, and its mixing with the former involves possibly serious interpretation problems. Nevertheless, there is some international cross-section evidence, based on household surveys alone, which does not suffer from these difficulties (Ravallion 1995, Lipton 1998). Country-specific growth spells reveal national elasticities of poverty incidence to growth up to more than 3, seldom below 1, and hardly ever negative (World Bank 2001, 54),<sup>19</sup> with no *general* tendency for a changing ratio between the income of the poor and that of the nonpoor.

However, the general assertion that “growth is good for the poor” is not the most interesting way to interpret this finding. What is interesting is to identify common features of positive (negative) residuals—cases where growth leads to substantially better (worse) poverty outcomes than predicted from global regressions. If these features can be linked to policies, there is a case for switching toward policies that connect the poor more to growth—though that case would be weaker if such a switch were associated with significantly slower growth.

A related policy issue is: has the tendency toward rising within-country inequality in 1985-2000 (Kanbur and Lustig 1999, Lundberg and Squire 1999, Cornia and Kiiski 2001) been due to *particular* growth-seeking policies? Since the late 1980s some large countries with fast growth in inequality (PRC, Russia, United States) have liberalized to some extent, in part to accelerate growth. But the example of Russia, with negative growth and worsening distribution, does not suggest that *positive* growth would worsen distribution. Within the developing world, however, countries containing large proportions of the world’s poor liberalized considerably in 1988-1995, accelerated growth, and worsened inequality in the 1990s. If one were to count *persons* in the developing world, a very large proportion are found where faster growth in the 1990s accompanied worse income distribution. The slowdown in the rate of poverty reduction in India during the accelerated growth of 1992-1997 (Jha 2000), and in the PRC, despite rapid growth, since 1985 (apart from the questionable data for 1993-1996), do not refute the finding that faster growth is *normally* better for the poor than slower growth, being not systematically offset by any change in distribution. But huge exceptions—and the possibility of clusters of countries where growth is much better for distribution, or much worse—mean that

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<sup>19</sup>Few single-country cases contain sufficient observations for statistical significance, however.

these findings are the beginning, not the end, of the inquiry. In particular, growth may be more pro-poor in more initially equal places and times. That tendency could increase over time, or decrease, according to whether low-end inequalities diverge or converge (Ravallion 2000).

### **Evidence: Impact of Distribution on Growth and Poverty: “Pro-growth Poverty Reduction”?**

So far we have concentrated on pro-poor growth. However, its prospects are intertwined with those for pro-growth poverty reduction. If the sign of effect of growth on poverty is the same as the sign of effect of poverty on growth, the mutual effects cumulate and strengthen one another, e.g., a small amount of pro-poor growth will later be amplified because the poverty decline then ignites further growth. If the signs are different, each effect is damped. So whether (or how much) growth causes poverty reduction (or low-end redistribution) depends, after the earliest stages, on whether poverty reduction (or low-end redistribution) causes extra growth. Moreover, data analysis can seldom firmly assert pro-poor growth and not *pro-growth poverty reduction*. Tests of direction of causation are often reported, but are hard to interpret, given the shortness of most growth spells and the likelihood that a country's Gini in one year, or even one quinquennium, is a good predictor of its Gini in the next.<sup>20</sup>

There are three ways in which lower, or falling, Ginis can improve the rate of transformation of growth into poverty reduction. Reducing the per-person income or consumption (IC) Gini<sup>21</sup> normally reduces *static poverty*, given mean income. It may also tend to improve the *impact of a given growth rate upon the poor*, for arithmetical or political economy reasons.<sup>22</sup> But the effect of greater equality on poverty depends also, and over time increasingly, on *what greater income equality does to the growth rate*.

#### *Impact of IC Distribution on Growth*

Until the 1970s most economists argued that more inequality was conducive to faster growth. Classical economists saw this as happening via higher savings rates. Kuznets suggested that urbanization, being a proxy for a shift from agricultural to industrial production, implied increasing inequality as a “cause” of early development. Assuming rural-agricultural and urban-industrial sectors internally equal with

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<sup>20</sup>This likelihood may be even stronger in predicting countries' Gini rankings.

<sup>21</sup>Shown by the prevalence of lognormal distributions of income and consumption (Datt and Ravallion 1992, Dollar and Kraay 2000) normally to accompany raising the income share of the poor.

<sup>22</sup>It is plausible that the rich are both more powerful to seize a larger share of any growth, and willing to make more sacrifices and to incur more costs to do so, if inequality is greater than if it is smaller initially.

the urban sector are much smaller, as people urbanize, this traces out a pattern of rising inequality alongside early economic growth.<sup>23</sup>

Both arguments rest on a mental image of a zero-saving, nonaccumulating, stagnant but equal rural society, from which modern growth and development emerge via inequality, which is associated with urbanization and savings. That model ignored the quite high savings rates (partly due to seasonality and harvest fluctuation) associated with even very poor settled farmers. Indeed, evidence for systematically rising inequality during, let alone causing, early economic growth was always scarce. Anand and Kanbur (1993) showed that most countries experienced no time-series Kuznets-type rise in Ginis during early growth.

On the other hand, theory and evidence began to emerge that inequality might cause *slower* growth, at least in developing countries. The original *evidence* (Persson and Tabellini 1994, Alesina and Rodrik 1994) was supported by a political-economy *explanation*: very unequal distributions produced pressure on governments from “median voters” to redistribute, leading to high tax disincentives and distortions that slowed growth. Clarke (1997) strengthened the evidence by controlling for other sources of growth, but refuted the explanation, showing that the inequality-to-growth link was no weaker in nondemocracies, where the political economy pressures from median voters were presumably less. It says much about current intellectual fashions that the extreme inequality is supposed to harm growth, not in itself, but because it creates pressures toward inept redistribution! But the claim of harm makes sense on simpler grounds. Very high IC Ginis are likely to have a nonincentive, ascribed component, not helpful to growth (discussed later). They are likelier than low IC Ginis to reflect exclusion of substantial groups (women, ethnic or linguistic minorities, the remote) or, simply, discontinuous income thresholds below which it is far harder or costlier to borrow, to take risks, to move from work to school, etc. All these things are much likelier to prevail in poorer countries: low mean IC *and* high inequality push significant proportions of people below an income level permitting even adequate nutrition (Payne and Lipton 1994), and greatly reduce willingness to take risks<sup>24</sup> and thus to escape poverty. Hence extreme inequality in low-income countries appears a plausible cause of reduced competitiveness, wasted human

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<sup>23</sup>The rise is sharper if, as is usually the case, intra-urban distribution is more unequal than intra-rural. If these distributions are identical, the rise is reversed when urban shares of population and income pass a critical point, generating the inverse-U “Kuznets curve.”

<sup>24</sup>Bowles (1999, p.4) fears that “potentially offsetting efficiency losses may result from egalitarian asset transfers where, as will generally be the case, they result in a transfer of control over productive risk taking from less to more risk averse agents”, so that “an important productivity-enhancing aspect of high levels of wealth inequality is that assets are controlled by agents who are close to risk neutral, and who thus choose a more nearly socially optimal level of risk.” This seems to be much too gloomy. Risk aversion presumably differs little among the richest 5 percent of persons, but rises steeply as income falls below the poverty line. Costs of transition apart, shifting income or assets from the top 5 percent to the poorest 15-30 percent would therefore increase willingness in the population as a whole to take risks (e.g., riskier, but normally more valuable, crop mixes would be planted).

resources, and slow growth. But the arguments on both sides are a priori; empirical work is needed.

Barro (2000), in the most information-rich and robust analysis of the effects of inequality on growth to date, confirms a negative impact for countries with mean income below \$2,100 (in constant 1985 purchasing power), with a one standard deviation reduction in the Gini associated with a 0.5 percent rise in subsequent annual growth of GDP per person. He identifies a further effect of high Ginis in raising fertility—in turn known to cause subsequent slower growth (and less equal distribution) in low-income countries, more so where mean income is lower or fertility higher (Barro 2000, Kelley and Schmidt 1994, Eastwood and Lipton 1999<sup>25</sup>). Barro finds no impact of IC inequality on growth over the entire range of countries and periods—and a *favorable* impact in developed countries—but in poor countries the negative impact seems clear, not very small, and robust to the inclusion of other variables believed to account for economic growth.

#### *Impact of IC Distribution on Conversion of Growth into Poverty Reduction*

Data for 65 developing countries in the 1980s and 1990s suggest a big negative effect of high initial inequality on conversion of growth into reduced dollar poverty incidence. Growth of 1 percent in mean per-person consumption with an initial Gini of 0.2 brought a 2.9 percent fall in dollar poverty incidence; with a Gini of 0.4, a 2.1 percent fall; and with a Gini of 0.6, a 1.2 percent fall (World Bank 2001, 54). The second section above also suggests a negative effect of initial inequality on the elasticity of connection.

This last finding, since income Ginis and interquintile inequality tend to move very closely together (Datt and Ravallion 1992),<sup>26</sup> disputes the view that income Ginis are sluggish: if they did not change, the bottom quintile would always have the same share of IC, which is false. Some have suggested that political economy endogenizes inequality, so the Gini tends in normal times to be sluggish because it reflects a power structure, and both it and the income Gini normally tend to perpetuate themselves. This cannot be taken too far, however, for the following reasons:

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<sup>25</sup>“Cross-national regressions indicate that higher fertility increases poverty both by retarding economic growth and by skewing distribution against the poor. Our median country in 1980 had ‘dollar-a-day’ poverty incidence of 18.9%; had it reduced its fertility by 4 per 1000 throughout the 1980s (the sample median fall)... incidence would have been reduced to 13.9%, growth and distribution effects being roughly equally responsible for this reduction” (Eastwood and Lipton 1999, 18)

<sup>26</sup>For example, because per-person income and consumption are distributed close to lognormally (Dollar and Kraay 2000).

- (i) First, endogenous inequality might mean not stagnant but divergent Ginis. Countries with strong and powerful masses may tend to reduce already low Ginis, and strong and powerful classes to raise already high ones.<sup>27</sup>
- (ii) Second, national inequality might be endogenous, but in a global system, not a national one. Opponents of globalization claim that it tends to raise inequality among countries, and usually within them. The Heckscher-Ohlin theorem predicts that freer trade reduces inequality within countries with high labor/capital ratios (overlapping strongly with low-income countries) and raises it elsewhere. Ravallion (2000) finds evidence of recent convergence toward “medium” inequality (“a negative correlation across countries between the changes in within-country inequality and the initial levels of inequality”).
- (iii) Third, even with medium-term convergence of national Ginis, national policy regimes or world policy climates’ can change sharply, and inequality with them. After prolonged sluggishness (Bruno et al. 1996, Deininger and Squire 1996), within-country IC Ginis tended to rise from the mid-1980s (Kanbur and Lustig 1999, Cornia and Kiiski 2001, Lundberg and Squire 1999) sharply in many transitional (Milanovic 1998), East Asian (Ahuja et al. 1997) and developed (Atkinson et al. 1995) countries. This *probably* means that growth got less poverty-reducing after the mid-1980s. Indeed, the elasticity to national mean IC or GDP for most *poor people*, of *absolute dollar poverty* was lower in the 1990s than previously (because most poor people live in Asia, where such elasticities fell). It is not yet clear whether this is also true of the elasticity to national mean IC or GDP of *poorest quintile income across countries* (irrespective of mean income).<sup>28</sup>

At least for Brazil and India, rises, falls, convergence, or divergence in national Ginis imply similar trends in the IC share of all lower quantiles (Datt and Ravallion 1992). What, then, do the above mixed findings on Ginis mean for the effects, in developing countries, of reduced initial IC inequality on poverty? First is the static effect: the poor get more of initial income. Second, there are the two Barro effects: lower Ginis in low-income countries accelerate growth and also curb fertility, which further accelerates growth. Finally, there is another way in which, via fertility, lower Ginis in developing countries help the poor through a virtuous circle of more growth and more poverty reduction. Fertility reduction raises the income of the poor, not

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<sup>27</sup> Ravallion (2000) has argued that Ginis converged among countries after about 1980. Perhaps there are cycles of rising and falling Ginis, as the self-reinforcing process of “classes and masses” reaches limits and generates incentives to employ, or politically mobilize, very poor workers, or frustrated talent denied high rewards.

<sup>28</sup> Dollar and Kraay report only a comparison of 1960-1980 and 1980 onward.



only via growth, but also to almost the same extent through reducing inequality (Eastwood and Lipton 1999).

*IC Distribution or Asset Distribution?*

Several analysts (e.g., Lundberg and Squire 1999) argue that asset inequality is slowing growth,<sup>29</sup> and that, if this is controlled for, income inequality has no effect on growth. However, this is a hard statement to read, since income inequality is logically identical to the upshot of inequalities in assets, returns to assets, labor–power, labor–rewards, and household ratios between dependents and workers or asset holders. It is plausible to see asset inequality as proxy for ascribed inequality, and thus *capturing the part of* income inequality that is dysfunctional for growth, rather than as *distinct from* income inequality.

Land asset inequality has been associated with slower growth (Deininger and Olinto 2000, Tyler et al. 1993). Land inequality may depress growth in labor-surplus economies because it concentrates the scarce factor, land, in large farms with high labor-related transactions costs, and hence somewhat lower net value added per hectare. There are few scale economies in agriculture, and in developing countries maybe the reverse (Binswanger et al. 1995, Lipton 1993). Further, if benefits from rural growth depend heavily on access to farmland, then its inequality is likely to be important for the transmission of growth into poverty reduction, which is disproportionately rural (IFAD 2001).

Birdsall et al. (1995) show that *educational* access inequality, and resulting inequalities in human capital, retard growth within and among countries. Great inequality in educational access tends to mean that many people (the poor, especially girls) do not complete primary schooling, which normally has a higher social rate of return than tertiary schooling (Psacharopoulos 1995), which dominates educational budgets where benefits from these are distributed very unequally. Arbitrary inequalities in educational access obviously reduce the growth impact of educational resources, of employers' selection of educated persons, and of production processes.

However, industrial and other heavy assets may be unlike land and education, since concentrated management, due to economies of scale or agglomeration, may well be good for growth. Concentration of asset management is not the same as unequal asset ownership, but they are likely to go together. Development normally accompanies growing urbanization and industrialization of assets, i.e., shifts assets from sectors where transaction costs bring scale diseconomies, to sectors where they

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<sup>29</sup>We have seen no analysis of whether asset, rather than income, inequality harms the conversion of growth into poverty reduction, but this proposition meets the same problem as outlined here.

bring scale economies.<sup>30</sup> Unless development also brings a growing divorce between asset ownership and asset management, one would then expect asset inequality, even though a “cause” of slower growth in developing countries, to be less so in developed countries, or even the reverse, following Barro’s (2000) finding on income inequality.

These highly contestable causal links from IC or asset equalization, to faster growth in low-income countries, but slower growth in high-income ones, are not universal determined paths, removing policy choices from governments. Even in a highly developed country, there will be scope for public sector actions, or withdrawals from action, that are specially helpful to the poorest in ways that reduce exclusion, promote access and competition, and accelerate growth. Even in a low-income country, where *many* government actions (or withdrawals) improving IC-distribution will thereby later accelerate growth, *some* are liable to retard it. We conjecture that few countries are near their “growth-Gini frontier”, or even up against binding political economy constraints that prevent them from moving closer to it.

Crucial is the distinction between ascribed and achieved inequality. Ascribed inequality slows (and distorts) growth by artificially rationing market access, not by capacity to get good returns from what is bought, but by status, and by purchasing power acquired not through the market value or amount of one’s effort but through status. Extreme ascribed asset inequality, and consequent ascribed (usually inherited) patterns of income inequality it helps to create, characterize land-based developing economies. It harms growth by denying large parts of human resources a chance to develop themselves, making both them and the educational system cost-ineffective and inadequately competitive. (The resulting impediments to growth do *not* depend wholly, as is sometimes suggested, on ill-functioning capital markets for loans to finance education.) A high land Gini appears disproportionately important in predicting a high IC Gini even where agriculture has dwindled to only 10-15 percent of GDP (Carter 2001). This recalls Moore’s (1966) use of historical methods to argue that, where societies are based on severe and unreformed land inequalities, that impedes the development of modern political systems based on equality before the law and open justice. If indeed, as argued elsewhere by Barro (1997), such matters (and the associated forms of property rights) are crucial for growth, then the freezing of antipoor structures of ascribed asset inequality may be a long-term inhibitor of growth, as well as of poverty reduction given growth.

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<sup>30</sup>Further, because of rising capital/labor ratios in agriculture, development means that reduced capital-transaction costs through large farms becomes more important, and reduced labor transaction costs through small farms becomes less important. This similarly may weaken or reverse the negative impact of inequality on growth.

*Redistribution and the Growth–Poverty–Reduction Sequence*

Kanbur and Lustig (1999) suggest that sharp rises in national IC Ginis in the 1980s and 1990s, together with new evidence that this may harm growth in developing countries, have placed redistribution back on the agenda. We fully agree, but the agenda item is slightly different from the question of whether a smaller IC or asset distribution is better than a bigger one, for growth or even for welfare or capabilities. There are transition/transaction costs of redistribution. There may also be transaction benefits, e.g., if the poor learn to organize peacefully but effectively for redistribution in a civic culture. These costs and benefits of the shift from old to new distribution are taxes or subsidies to the growth process, over and above the different effects on it of the new distribution, compared to the old one.

The extent to which redistribution is disruptive, consensual (or consensus-forming), well-targeted, and inexpensive in administrators (and not rent-creating for them<sup>31</sup>) is relevant. Can Ginis be cut consensually? Perhaps, if the rich are convinced this will increase their own welfare faster than alternatives, e.g., if they gain more from faster growth than they lose from redistribution. This links up to the types-of-inequality issue. If land reform and fertility-reducing changes induce growth as well as redistribution, even the rich and powerful might get absolutely better off. Would they buy a loss in relative position to attain that? Clearly it depends on the scale of changes. Suppose that sharply reducing some very growth-constricting form of ascribed inequality raises the rate of growth of mean income from 1 to 5 percent, but for the poor from 0.8 to 8 percent, and for the rich from 1.1 to 4 percent. The rich might accept that, especially if they dislike seeing poverty around them, are scared of its risks for them, from infection to revolution, or hanker after insurance-type redistribution against the risk that they may later go from riches to rags. A probably political-economy-compatible form of redistribution might involve subsidized insurance that raised security for all; it has more impact on the poor, who are more subject to and more damaged by adverse events (Gelbach and Pritchett 1997).

**Economics 101 View of When Growth Might be Bad for the Poor**

The agenda for making the pro-poor growth debate useful centers on disaggregating: on finding types of economy (or policy regime) linked to more, or less, or to favorable or unfavorable impacts of growth on poverty. In this context, it helps to ask: does elementary economics suggest any type of economy, or situation, that might make growth *anti-poor*?

First, there may be immiserizing growth (Bhagwati 1958). If a country has a market share for an export above its price elasticity of demand (as with Sri Lanka

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<sup>31</sup>This is not easy. However, ascribed inequalities both embody and create rents, and apart from rent amounts, rent-seeking and its costs (Krueger 1974) may be cut by reductions in inequality.

tea in the 1960s), country volume growth of that export is revenue-decreasing. Since there are production costs at the margin, immiserizing growth happens even with some excess of product elasticity over market share. Value-added in such a product may be a big share of GNP (e.g., cloves in Zanzibar in the 1970s), so that equiproportionate growth in the volume of *all* value-added could well be mean-welfare-reducing. With no change in distribution, that would obviously increase poverty on any of the alpha measures.

Second, growth can be bad at, or even negative for, poverty reduction if growth shifts *demand* away from products made by immobile poor workers (the coarse-cloth effect).

Third, on the *supply* side, growth can be poverty-unfriendly if there is technical progress that is either Hicks labor-saving (the tractor effect) or relatively slow in sectors in which the immobile poor are concentrated (handloom-weavers effect).

Fourth, whether due to demand or to supply factors, growth may shift resources away from making poor people's products, so their relative prices rise unless the economy is fully open with zero transport costs (the millets-to-milk effect).

These are all really micro-effects; all are stated above in unduly partial-equilibrium form; and all have a sort of converse if read as conditions under which poverty increases (reductions) might not be bad (good) for growth. In addition there are familiar possible *macro*-effects, some of which stem from poverty effects of types of policy used to obtain faster growth.

### **Effect of Different Degrees and Types of Inequality**

Analysis of cross-sections of national time-periods, to establish causal links between Ginis and subsequent or prior growth or poverty, has suggested some important, largely negative, findings. However, such analysis is unlikely to capture the complex and situation-specific effects of distribution on growth and poverty. Also, when better data are available, even international cross-section analysis needs to test the plausible hypotheses that:

- (i) very high and very low inequality are both likely to harm growth and poverty reduction;
- (ii) While some forms of *achieved* inequality reflect incentives (rather than producers' surpluses) conducive to growth and thus poverty reduction, *ascribed* inequality based on (say) inheritance, ethnic or gender discrimination, or urban bias is a tax on incentives, a barrier to efficient markets, and hence an enemy to both growth and poverty reduction.

*How Much or How Little Initial Inequality is Good or Bad for the Poor?*

Barro (2000) shows that initial IC equality does not affect growth, controlling for other variables, in regressions over the whole range of country mean incomes. However, he also shows a significant and considerable effect for subsamples: favorable for low-income countries and unfavorable for high-income countries. A disaggregation between low-inequality and high-inequality countries also seems promising. It is plausible that there are favorable growth returns to reducing inequality in the latter, but less so (indeed at the extremes negative returns) in the former. If everyone has almost the same IC—irrespective of effort, risk-taking, saving, or market demand for skills—incentives are stifled and growth is likely to be very slow. If 5 percent of people enjoy 95 percent of IC, and especially if the mean is low, then most people are likely to be excluded from risk-taking (including some forms of migration), entrepreneurship, and saving, including the diversion of time from earning to learning. These exclusions are likely to make for very slow growth.

*Achieved and Ascribed Inequality, Growth, and Poverty Reduction*

Types of inequality, and hence of redistribution (at any given transaction/transition cost), differ in impacts both on growth and on elasticity of poverty to growth. In particular, inequality is normally antigrowth if *ascribed*, by laws or customs that assign income or assets on account of, for example, inheritance, status, gender, or ethnic group. But inequality may also be *pro-growth and achieved*, e.g., if attained through effort or market performance; or *antigrowth and achieved*, e.g., through force, fraud, or rent-seeking.

Some societies have overtaxed pro-growth achieved inequality, and in general earned incomes and hence effort and achievement, which in turn has retarded growth enough to raise long-run poverty. That this is in principle possible is a Rawlsian argument against *some sorts* of redistribution. Further, if pro-growth achieved inequality is so curtailed that economic activity provides few incentives, those highly motivated to enrich themselves are, by definition, likelier to have recourse to antigrowth methods, including crime, war, and politics in Ambrose Bierce's public-choice definition: the conduct of public affairs for private advantage (Bierce 1957) This may well work against the poor.

Ascribed inequality, however, is normally bad for poverty reduction. Statically, like pro-growth achieved inequality but without its offsetting stimulus to economic activity, it reduces income available for the poor. Dynamically, high ascribed incomes are a deadweight tax on GDP, reducing the amount available as incentive income. Further, those ascribed, or given prior or stronger claims on, assets—education, land, a high-prestige job, ownership of a parent's business—on account of inheritance, ethnic group or gender, exclude others, even those better able to generate

private and social returns from those assets. This harms efficiency and growth directly, and also by weakening and segmenting competitive pressures.

The only growth defense of inherited inequality—perhaps the type of ascribed inequality with most effect on distributional outcomes—is that it provides savings incentives, especially to the old (bequest motive), which may advance growth. This is relevant only if (i) growth is national-finance-constrained, and (ii) the positive effect of bequest motives on the savings and the work (or education-seeking) ethic of potential legators outweighs their negative effect on those of potential legatees. Perhaps enforcement (national or global) of high, progressive taxes on bequests and gifts *inter vivos*—say 95 percent over \$5 million cumulative—would induce a huge capitalist growth surge.<sup>32</sup> Virtually eliminating large inherited claims, even by democratic consent, may well be judged oppressive, inconsistent with the constitution of liberty or even with human (and animal) nature: genetic programming to pass on more than genes to children. But, in sharp contrast to extreme compression of achieved inequality, it would probably be good for growth.

It may be objected that policies to cut inequality—even ascribed—reduce security of property rights. Some indicators of arbitrary abrogation of property rights are correlated (not always very robustly) with slower subsequent growth (Barro 1997). But inheritance tax law and its enforcement have differed hugely, even among liberal and democratic countries and over time; we have found no evidence regarding effects on growth. It is not clear that a democratically legitimized decision to shift a given tax burden toward high, progressive inheritance taxation is an abrogation of property rights, let alone an arbitrary one. Nor has anyone shown that property taxes are worse for efficiency or growth than others; Adam Smith (1776) argued that they were better, admittedly in the context of a plea for light taxation overall. There are less provocative measures encouraging property redistribution by private actions and discouraging enormous private inheritances, such as the Rignano plan (to levy Italian estate duty on recipients proportionately to the size of the bequest) (Crosland 1959), or progressive land tax. This, by encouraging land redistribution consensually, would also probably move landholdings nearer optimal size, accelerating farm growth in land-scarce, labor-plentiful areas.

There is a problem, though, about identifying pro-growth achieved inequality, and placing low tax disincentives on it because it helps growth, while taxing ascribed inequality heavily because it is a deadweight upon growth. The problem is that even pro-growth achieved inequality *now* readily leads to its self-protection by political system manipulation, and, thus and via inheritance, to dysfunctional ascriptive inequality *later*. This brings social exclusion of the poor later (Bowles 1999, emphasizing race and gender effects), but it goes far beyond that. How can a society

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<sup>32</sup> Given this policy, people can differ about the extent to which the revenue should be used to reduce public debt, cut taxes, or raise public spending (not necessarily state-enlarging, e.g., the revenue could be hypothecated for a substantial and identical entrepreneurship-education grant to each citizen at the age of 18).

build in limits to such processes, while providing sufficient stimuli to work, risk-taking, discovery, and enterprise? That is perhaps the central problem of pro-poor growth.

There is a link between the two plausible hypotheses that (i) the extremes of both equality and inequality are liable to harm growth, and (ii) ascribed inequality is normally antigrowth, but (some types of not-too-extreme) achieved inequality are normally pro-growth. It is plausible that really extreme inequality can long persist only in societies where it is largely ascribed, enforced, and associated with inherited land, rather than achieved through market performance; humans are not all that different. If extreme inequality is mainly ascribed, and moderate inequality mainly achieved, this forms another reason to expect moderate inequality to help growth but extreme inequality to harm it. That leaves open what is extreme and what is moderate, and what are our tradeoffs between growth, poverty reduction, libertarian considerations including the 'right' to bequeath, and inequality reduction as an end in itself.

### **Policies Favoring Growth, Equality, and Poverty Reduction**

Regressions get us only so far, even if we allow for the fact that specific sorts and degrees of inequality make growth more pro-poor, or poverty reduction more growth-friendly. The circumstances of poor countries differ. Can one identify such policies without descending to casual-empirical adhocery? That this may, up to a point, be feasible is suggested by combining the guidelines mentioned above with some facts about the world's 1.2 billion dollar-poor.

These poor spend some 70 percent of their income on food, and about half their income on food staples. Also, they earn over half of their income in cash and kind from growing such staples, or working for those who do. Some 70-75 percent of the dollar-poor are mainly engaged in agriculture (sometimes urban agriculture), and many of the rest in rural nonfarm activities whose growth depends mainly on growing demand from farm-based producers and (especially) consumers (IFAD 2001). Policies tending to increase the poor's command over food via more labor income and less food cost will be the main approach. Although much trade liberalization has taken place, poor growers of food staples are often protected by these products' high unit transport costs and low value/weight ratios, so increasing local food production does cut food prices and make food access more reliable. Rapidly rising labor supply and dependency burden, however, restrain growth of the poor's employment income and command over food.

This suggests that making growth more pro-poor in early development equals mainly:

- (i) achieving labor-intensive growth in food staples production, especially by appropriate technical progress;
- (ii) enhancing this impact of cheaper food and higher demand for rural labor by stimulating smaller-scale farms, e.g., via land distribution;
- (iii) increasing incentives to reduce fertility (mainly lower child mortality, more and better female education and work options, and probably family planning information) and spreading them to the poor.

What is the evidence? First, given overall growth of GDP or mean consumption, a *high rate of growth in agriculture* is associated with subsequent poverty reduction, though there is controversy about whether this is also true where agricultural income or land is initially very unequal. Second, *land redistribution* increases the income share of the poor, certainly statically (directly), and also probably by increasing subsequent growth of agricultural value-added, as well as the share of smallholders and laborers in such growth. Third, *declining fertility* causes both faster growth of per-person GDP and consumption, and their more equal distribution, in both cases reducing poverty; there may also be a virtuous circle in which greater equality, and some forms of economic growth, in turn cause fertility decline.

Some general points should be made about all these three effects in the context of pro-poor growth and pro-growth poverty reduction. First, there is some evidence that all three effects are stronger in poorer countries. Second, there are numerous and widespread examples of fertility decline, rapid agricultural growth, and (despite prevailing skepticism) land redistribution (IFAD 2001, 77-82), in developing countries in the past 50 years. In many cases there is, at least, plausible evidence at the national level that such conditions induced subsequent growth, redistribution, and/or poverty reduction. Third, all three conditions are often due to policies (sometimes deliberate, sometimes not), but sometimes to events, including *past* growth or redistribution, which create the prospect of positive or negative feedback between growth that is pro- (or anti) poor and redistribution that is pro- (or anti) growth. Fourth, there may be long, and among countries quite variable, lags between policy change, outcomes for land distribution or agricultural growth or fertility, and especially impacts of such outcomes on growth, distribution, and poverty.

### *Agricultural Growth*

We have seen that agricultural growth has been more pro-poor than other sectoral growth in a range of country cases, but some of the cross-national evidence suggests that in highly unequal developing countries agricultural growth did little or



nothing to reduce poverty. These conflicting findings need more analysis. It is credible that agricultural growth is less pro-poor where income, and especially land, are more unequal than where they are less so. But it is difficult to believe that in those countries agricultural growth does not, as in the other analyses cited, reduce poverty more than nonagricultural growth. Agriculture still produces much food, including food staples, in Latin American (and other unequal) developing countries, and is still much more labor-intensive than industry (and less skill-intensive than most services, especially the fast-growing ones). But these agricultural characteristics are less marked in developing countries with more unequal agricultural sectors. These pro-poor differences in sectoral characteristics apply to marginal (growth) production, as well as to average (initial) production. Therefore, while it is easy to see mechanisms making agricultural growth less poverty-reducing in unequal developing countries than elsewhere, it is hard to see mechanisms making it less poverty-reducing than domestic nonagricultural growth.

The evidence of the Green Revolution is that technical progress is a very substantial cause of agricultural growth, and has been very pro-poor in low-income countries (Kerr and Kohlavalli 1999, Lipton with Longhurst 1989). This indicates the need for national and international measures to revive and spread it to neglected crops and areas (IFAD 2001). Improved price incentives to agriculture obviously have a part to play in this. However, we need to raise questions about what may seem an obviously pro-poor policy sequence, viz: liberalize and remove antiagricultural bias (a good, crisp exposition is Krueger et al. 1996). Agriculture in most developing areas:

- (i) produces most of the poor's main consumable, food staples;
- (ii) employs (or self-employs) most of the poor;
- (iii) pays them in kind, or with access to local products (the poor often being self-employed smallholders or local farm workers with high marginal propensity to consume food) and is thus product self-absorbing, avoiding the demand-side problems above; and
- (iv) has the economy's highest average, and more important marginal, labor/capital ratios (and hence employment per unit of the scarce resource, capital).

Moreover, the great bulk of antiagricultural *price* bias in most developing countries is due to trade and foreign exchange manipulation (Krueger et al. 1996).

It is this argument, together with the quite strong evidence that trade liberalization does speed economic growth (plus the residual Heckscher-Ohlin hope that,

despite some evidence to date, freer trade also stimulates labor-intensive specialization overall), which has led many, including left liberals, to favor trade liberalization so strongly (e.g., Sen 1997). While the argument and evidence have some force, the reasoning is in fact quite complex and often doubtful. There are many caveats (not objections to agricultural liberalization) to the expectation of high food price and employment response, and hence poverty impact. We have space only to list the caveats here:

- (i) Most anti-farm/rural bias is not price bias.
- (ii) Given the internal polity, exogenously reformed cuts in price bias against rural producers bring correspondingly increased nonprice bias, e.g., in education or roads allocation, which, being less susceptible to price response, may harm the poor more.
- (iii) Agricultural liberalization lags other sectors in poor countries and even more in rich ones that overproduce farm products, signaling artificially low values to farmers and governments in developing countries.
- (iv) Agricultural growth and subsequent poverty reduction have historically resulted more from changing incentives by technical progress (raising output/input transformation rates) than by price reforms (raising output/input price ratios).
- (v) The nonfarm poor lose if the farm price rise comes through higher marketed food prices, not from cutting parastatal profits/inefficiencies; in many unequal countries even the rural poor are mostly net food buyers.

Removing farm price repression has helped to stimulate farm employment and production, and to reduce distortions in their composition. But pro-poor agricultural growth has depended more on appropriate technical progress (research, discovery, and innovation) and on the rural infrastructures that made adoption attractive.

#### *Land Redistribution*

“The English are still imbued with the doctrine, which is at least debatable, that great properties are necessary for the improvement of agriculture, and they seem still convinced that extreme inequality of wealth is the natural order of things” (de Tocqueville 1833, cited in Bowles 1999).

Even if the rich are fully compensated for land in a redistributive land reform, and even if the poor gainers (with an intermediate market-rate loan) pay the cost of

such compensation eventually, the poor gain more than the rich lose (and there is a GNP gain), since the poor use that land more labor-intensively and with higher net value added per hectare. Thornton (1848) and Mill (cited in Hollander 1985, 846-7) made the case in the 19<sup>th</sup> century; modern micro-level evidence confirms it (Binswanger et al. 1995, Lipton 1993). The presence of scale diseconomies in farming where labor transaction-cost reductions are central to efficiency, i.e., in labor-surplus economies, probably helps to explain the negative impact of land inequality on subsequent growth (Tyler and el-Ghoneimy 1992, Deininger and Olinto 2000).

### *Fertility Reduction*

Fertility reduction helps the poor both via faster growth and via more equality. The effect is strongest where initial inequality is greatest, poverty most pervasive, and initial mean income least (Eastwood and Lipton 1999). There may be a virtuous circle in which equality causes fertility reduction too (Barro 2000).

This happens at two levels. Nationally, lower labor supply pulls up wage-rates, while lower growth in population presses down the real price of food from the demand side, assuming either imperfectly open economies or significant transport costs. At the household level, lower dependency ratios increase the extent to which given employment income and food price permit adequate household nutrition. The former effect depends on national fertility decline, but the latter depends on the spread to the poor of incentives to cut fertility. Reduced fertility provides a further channel through which pro-poor policies (especially child mortality reduction and female education) improve future growth, since lower fertility contributes significantly to economic growth, albeit with a 10-15-year time-lag that may not be captured in Barro's formulation (Kelley and Schmidt 1994).

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# How Good is Growth?

James Foster and Miguel Székely

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**Abstract.** *This paper argues that the use of different methodologies for characterizing the well-being of the poor can lead to totally different views about the relationship between economic growth and poverty. The paper focuses on “general means”, which are well-known income standards that place greater weight on lower incomes. In contrast to results obtained using the “mean income of the bottom 20 percent of the distribution”, the paper finds that growth is good for the poor, but not necessarily as good as for other sectors of the population.*

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## Introduction

The question of whether economic growth guarantees poverty reduction is not new. But recently it has become the subject of intense debate among economists, with the peculiarity of having trespassed academic circles to arrive at the top of the political and policy agenda.<sup>1</sup>

A key reason for the interest in this topic is that it is at the heart of the debate between two very different models of development: One model emphasizes growth and efficiency under the idea that they eventually, if not immediately, improve the standard of living of the population at large, including the poor; the alternative model stresses that the state must play an active role in determining where the benefits of development end up, since it is not clear that the poor will benefit automatically. Under the first paradigm, governments concentrate in growth-promoting activities, while in the second, they devote considerable effort to redistribute resources.

The recent academic debate around the question on whether economic growth is a sufficient condition for guaranteeing poverty reduction is to a large extent due to the effort by Deininger and Squire (1996) of putting together an improved data base on income distribution. This has allowed researchers to explore the issue with better econometric techniques and more reliable information. However, there has been

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<sup>1</sup>Some of the recent academic papers are Ravallion and Chen (1997), Roemer and Gugerty (1997), Timmer (1997), Bruno, et al. (1998), Gallup et al. (1999), Dollar and Kraay (2000), Ravallion (2000), Morley (2000), and De Janvry and Sadoulet (2000). See for instance, *The Economist* (2000), for a political discussion around this issue.

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much less discussion around another central aspect, namely the methodological approach for characterizing the well-being of the poor.

This paper focuses precisely on this issue by asking whether different methodologies lead to different conclusions about the growth–poverty relationship. Growth, when given in the context of a stable income distribution, will raise the incomes of the whole population, and therefore, will tend to reduce poverty. So, the question is not whether growth is good or not, but rather, if different methodologies lead to differences in our perception about how good growth is.

The paper is divided into four sections. The first section summarizes the debate on the growth–poverty relationship. The second section discusses an alternative approach. The third section asks whether the differences in methodology for characterizing the well-being of the poor lead to different conclusions about the growth–poverty relationship. The fourth section concludes.

### **Previous Evidence on the Growth–Poverty Relationship**

As discussed in Foster and Székely (2001), empirical evidence on whether the benefits of economic growth are shared by the poor started to be produced systematically around the 1970s, when compilations of income distribution statistics for several countries started to become available. The first papers on the subject focused on the relationship between growth and inequality since they were mainly concerned with verifying the Kuznets hypothesis that inequality increases during the initial phases of development, and declines after a turning point. The earlier papers were also specifically concerned with the effects of growth on the standard of living of the poor. For instance, Adelman and Morris (1973), Ahluwalia (1976), and Ahluwalia et al. (1979) asked whether there was a systematic relationship between economic growth and the income share of the bottom quintile. They concluded that this share tends to decline in the early stages of development, but increases in the long run.

The growth–inequality relationship took center stage during the 1980s, and only recently has there been renewed interest on the question of whether the poor specifically—rather than all sectors of society—share the benefits of growth proportionally. Recent papers follow two different approaches for classifying the population into poor and nonpoor. The first uses a relative concept of poverty by estimating the growth elasticity of the per capita income of individuals in the first quintile of the distribution.<sup>2</sup> There are two opposing views on the relation. While Roemer and Gugerty (1997), Gallup et al. (1999), and Dollar and Kraay (2000) argue that the elasticity is practically one, Timmer (1997) obtains an elasticity of around

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<sup>2</sup>The paper by Barro (1999) is one of the only papers to follow the earlier literature by estimating the growth elasticity of the income share of the poorest 20 percent.



0.8. Although these four studies use the same data and similar econometric techniques, they disagree on whether growth in average income leads to a one-to-one improvement in the incomes of the poor, or to considerable smaller gains for this group.

The second approach has been to examine the growth elasticity of poverty defined in absolute terms. Ravallion (2000), Ravallion and Chen (1997), and Bruno et al. (1998) find that the elasticity of the headcount ratio is typically higher than 2, or in other words, when average income increases by 10 percent, the proportion of poor declines by more than 20 percent. Other authors, such as Morley (2000), De Janvry and Sadoulet (2000), and Smolensky et al. (1994) report a smaller elasticity of around one percent, but these are obtained from a smaller sample of countries. Ravallion and Chen (1997) also use poverty lines that combine an absolute and a relative component. Their elasticities are highly sensitive to where the poverty line is located. The elasticity of poverty to growth ranges from -2.59 to -.69 depending on whether the threshold is established at 50 or 100 percent of the average income observed at the initial period of observation.

As compared to the literature on the growth–inequality relationship, the above approaches have the advantage that an intuitive interpretation can be given to the estimated growth elasticity. But this comes at the cost of having to specify the cut off point after which changes in income are ignored. The need to define a threshold for dividing the population into poor and nonpoor introduces three issues into the analysis. The first is that poverty measures are highly sensitive to where the poverty line is set. For instance Chen and Ravallion (1997) report that when using a definition of poverty of one dollar-per-day purchasing power parity (PPP) adjusted to 1993 prices, poverty in Latin America and the Caribbean is 15.6 percent, while if a relative poverty line is applied to the same data, the proportion is 51.4 percent. Székely et al. (2000) arrive at a similar conclusion: the proportion of poor in Latin America ranges from 22.8 to 56.8 percent, depending on which of the poverty lines that are commonly used in the region is adopted. Moreover, in countries where there is high income concentration around the poverty line, even inframarginal variations in the value of the threshold may lead to large differences in poverty rates.<sup>3</sup>

The second issue is that the absolute and relative poverty measures used in the literature give exactly the same weight to all the poor. For instance, household survey data for Argentina 1998 reveal that the highest income among the poorest 20 percent of the population is \$90 per month PPP at 1985 prices, while the average income among the poorest 3 percent is less than \$7 PPP. Should a marginal increase in income for the second individual have the same value as a marginal gain for the first?

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<sup>3</sup>For example, take the case of El Salvador in 1997. If the poverty line is defined as 1985 PPP 2-dollars-a-day, the highest income among the poor turns out to be \$1.99999, while the individual marginally above the poverty line has an income of \$2.00073 per day, a difference of less than 1 thousandth of a cent. In fact, around 1 percent of the total population has an income within 3 cents of the value of the poverty line.

If the interest is on whether relatively poorer individuals gain more from growth, then the answer is clearly no.

The third issue refers to the meaning of being poor. If a relative poverty line—such as the lower 20 percent of the distribution—is adopted then all individuals in the first quintile will be classified as poor, regardless of their absolute standard of living level. This implies assigning the same weight to an individual in the lower 20 percent of the distribution in Sweden, who has an income of \$450 PPP per month in 1991, as an individual in the poorest 20 percent in Kenya, with an income of barely \$12.

### **An Alternative Approach**

The traditional approaches discussed above are comprehensible, but clearly, none of these methods of identifying the poor are entirely satisfactory in the demanding environment of cross-country evaluations over time. Even if there were a thoroughly acceptable methodology for setting poverty lines in this context, there would still be significant questions about the use of an abrupt 0-1 cutoff. Why should an income slightly higher be ignored, just because it is above the arbitrary cutoff being employed? Further questions pertain to the aggregation methods typically used in these studies. For example, why should an income that is just below the poverty standard receive the same weight in the aggregation process as one that is much lower, as is implicit in the use of the headcount ratio, the poverty gap, and the per capita income? A more defensible position might be to require progressively more weight to be placed on incomes further down the distribution.

### **General Means as Income Standards**

Foster and Székely (2001) propose an alternative methodology to track low incomes based on Atkinson's (1970) family of "equally distributed equivalent income" functions, called "general means". The analytical framework and definitions are the following:

An income distribution is a vector of the form  $x = (x_1, \dots, x_n)$  where  $x_i > 0$  is the income of the  $i$ th person. The population size  $n$  may vary across all positive integers. The set of all income distributions under consideration is given by the set  $D = U_{n=1}^{\infty} R_{++}^n$ . The income standard traditionally used in the evaluation of economic growth is the per capita or mean income  $\mu = \mu(x) = (x_1 + \dots + x_n)/n$ , which is the aggregate income in  $x$  divided by the population size  $n$  of  $x$ . The class of general means is given by the formula  $\mu_{\alpha}(x) = [(x_1^{\alpha} + \dots + x_n^{\alpha})/n]^{1/\alpha}$  for all  $\alpha \neq 0$  and  $\mu_{\alpha}(x) = (x_1 \cdots x_n)^{1/n}$  for  $\alpha = 0$ . Clearly, the general mean reduces to the standard mean when  $\alpha = 1$ . The case where  $\alpha = 0$  is often called the geometric mean while  $\alpha = -1$  is known

as the harmonic mean. It is an easy matter to show that for fixed  $x$ , the general mean  $\mu_\alpha(x)$  is increasing in the parameter  $\alpha$ , with the limit as  $\alpha$  falls to  $-\infty$  being the minimum income in  $x$ , and the limit as  $\alpha$  rises to  $\infty$  being the maximum income. Each  $\mu_\alpha(x)$  provides an alternative income standard or representative income for  $x$ , which places more weight on higher incomes for higher parameter values and more weight on lower incomes at lower parameter values.

Foster and Székely characterize the properties of general means formally, and show that unlike some of the alternative characterizations of the well-being of the poor in the first section, such as the per capita income at the bottom 20 percent of the distribution, general means have the advantage of being subgroup-consistent.

For the analysis of the growth–poverty relationship, the focus is on general means that emphasize lower incomes, namely,  $\mu_\alpha(x)$  for  $\alpha < 1$ . The parameter indicates the extent to which poorer incomes are emphasized in the income standard, or its “bottom sensitivity.” Thus, general means for  $\alpha < 1$  are income standards that emphasize the incomes of the poor, but without ignoring the incomes of the near-poor. Progressively less weight is placed on higher incomes. No arbitrary poverty standard is used. Rather, the curvature properties of a general mean ensure that higher incomes contribute very little to its value. In a sense, the presence of low incomes endogenously suppresses the impact of changes in higher incomes.

The method of evaluating the effects of growth on poor incomes is based on a comparison of growth rates for two standards of living: the ordinary mean and a bottom-sensitive general mean. The motivating question becomes: To what extent is growth in the ordinary mean accompanied by growth in the general mean? If growth were distributionally neutral, in that all incomes rise by the same proportion, then both standards would grow at the same rate. However, if the bulk of the increase in the mean takes place at the high end of the distribution, the growth rate in the general mean will lag behind the growth in the ordinary mean. Alternatively, if the general mean grows faster than the ordinary mean, this is a signal that growth disproportionately benefits the poor.

A key indicator in this approach is the growth elasticity of the general mean, or the percentage change in the general mean over the percentage change in the mean. Then proportional growth would lead to an elasticity of one, while pro-poor growth would be associated with an elasticity greater than one. If the elasticity is positive, but less than one, this indicates that although growth favors the richer incomes, it also includes the poor to some extent. However, a nonpositive elasticity is a strong indicator of growth that does not benefit the poor.

This approach yields additional dividends beyond the motivating question. Reinterpreting the general mean as a measure of social welfare as in Atkinson (1970), the question becomes the extent to which growth in per capita income is accompanied by growth in social welfare. So if the above elasticity is greater than one, this indicates growth that favors an even more rapid expansion of social welfare;

while an elasticity less than one indicates that economic growth is somewhat less effective in generating an increase in social welfare. Hence, there is a useful normative interpretation of the methodology.

It is also possible to make statements about inequality in this framework, using Atkinson's definition of inequality as unity minus the ratio of the general mean to the ordinary mean. Clearly if the data show that the elasticity is generally greater than one, the general mean rises faster than the ordinary mean, implying that the associated Atkinson inequality measure is falling. Hence, we have a method of evaluating the impact of growth on welfare and inequality, in addition to our original concern with low incomes.

### **Economic Growth and Poverty Reduction**

This section reproduces empirical results and text from Section 3 of Foster and Székely (2001).

#### **Data Description and Estimation Issues**

Practically all the recent papers asking whether growth is good for the poor use the data set by Deininger and Squire (1996), which includes Gini coefficients and quintile shares for a large number of countries and years. This kind of aggregate data is not suitable for implementing the general means approach because to compute the general means it is necessary to have access to micro data in order to apply a weight to each individual in the distribution. Therefore, it is necessary to construct a data set directly from the micro data in household surveys.

The analysis is performed over 144 household surveys from 20 countries between 1976 and 1999, which are used to compute the general means. The sample includes 17 Latin American countries; Thailand; Taipei,China; and United States. The number of observations per country ranges from 2 for the Dominican Republic, Ecuador, Nicaragua, and Paraguay, to more than 11 data points for Brazil; Costa Rica; Taipei,China; and United States. Appendix Table A1 gives more details of the household surveys included in the sample.

Since the interest of this paper is on changes in welfare at the bottom of the distribution, general means are computed for each household survey for parameter values of  $\alpha=0$ ,  $\alpha=-1$ ,  $\alpha=-2$ ,  $\alpha=-3$ ,  $\alpha=-4$ , and then each observation is linked to the growth in average income from the same survey. Rather than using the original incomes, the data is adjusted to make per capita incomes equal to PPP-adjusted GDP

per capita so that the results are more comparable to other elasticities reported in the literature.<sup>4</sup>

The central equation of interest is therefore:

$$\log \mu_{\alpha}(x)_{i,t} - \log \mu_{\alpha}(x)_{i,t-1} = c + \log \mu_1(x)_{i,t} - \log \mu_1(x)_{i,t-1} + \varepsilon_i$$

where  $t$  is the year in which a household survey for country  $i$  is available, and  $\gamma$  is an error term.

Having direct access to each of the 144 household surveys allows us to produce a data set with a high degree of comparability across observations, which minimizes measurement error in the dependent variable.<sup>5</sup> On one hand access to the micro data allows to assure that the income concept is comparable within each country over time, on the other, the lack of comparability across countries that inevitably remains becomes irrelevant when regressions are estimated in first differences, as is done below.<sup>6</sup> The high degree of comparability comes at the cost of having a reduced sample covering mostly developing countries from only one region in the world, but robustness tests confirm that this characteristic of the sample does not drive the central conclusion.

The timing of the available data points to explore the relation between growth and poverty has been an issue in applied work, mainly because the Deininger-Squire data provides an unbalanced panel with observations scattered over several years. It has been standard practice to produce a reduced data set by spacing observations over 5 to 10 years and to use various estimation methods to impute information when

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<sup>4</sup>PPP GDP per capita figures for years between 1975 and 1992 are obtained from the World Penn Tables. To expand the series up to 1998 the rate of growth of real GDP in local currency from the *World Development Indicators* 2000 is used. The GDP for 1999 was obtained from the Economic and Social Data Base at the Inter American Development Bank. Deaton (2000) has pointed out the various problems introduced by the use of these PPP conversion factors but we still use this methodology to make our results comparable with estimates published by other authors.

<sup>5</sup>Although the Deininger-Squire data is a major improvement over the information available to authors such as Ahluwalia, it still has some limitations. The most important is that the data is not comparable across or even within countries, so it is difficult to distinguish the noise-to-signal ratio it produces. This lack of comparability introduces measurement errors that are very hard to assess. Székely and Hilgert (1999), Atkinson and Brandolini (1999), and Pyatt (1999) provide a more thorough discussion of the problems of these kinds of secondary data sets. Most users of the Deininger-Squire data include some information on the characteristics of household surveys into regression specifications to reduce the comparability problems. However, these controls are not able to correct for fundamental differences such as the types of incomes captured by a survey, or the survey timing. Their importance is clearly illustrated in the recent paper by Panizza (2001), who shows that the relation between inequality and economic growth changes substantially when strictly comparable data is used.

<sup>6</sup>When the income definition changes between surveys for a country, a series with the minimum common denominator to ensure consistency is produced. This entails some loss of information, but we believe that there are larger gains from reducing the noise-to-signal ratio of the series.

an observation for a specific year is missing.<sup>7</sup> As shown in Appendix Table A1, household surveys for several countries in the sample belong to successive years or are only 2 or 3 years apart. Therefore, eliminating observations to produce a balanced panel would entail a significant loss in sample size, so the base estimates refer to the full 144 observations. However, the conclusions are robust to eliminating information for successive years and estimating the growth-poverty relationship with a reduced data set with observations every 3 years.

Regarding estimation techniques, the standard practice has been to estimate the poverty-growth elasticity in first differences, which eliminate the effect of time-invariant country characteristics. However, there are some discrepancies in the literature on how standard errors are corrected. Some authors acknowledge that successive spells within countries have one survey in common, and are therefore not independent observations (see especially Ravallion and Chen 1997). To produce the results reported here the base regressions are estimated in first differences, but in all cases Huber-White robust standard errors are reported in order to address this issue. Most of the poverty-growth elasticities reported in the literature do not acknowledge the potential endogeneity problem that arises from the fact that average income and measures of the standard of living of the poor are computed by using basically the same information. Dollar and Kraay (2000) deal with this by using instrumental variables and also address the problem arising with the inclusion of lagged endogenous variables.<sup>8</sup> Although the results in the following section refer to standard first difference estimations, tests of whether the results are robust to the use of these techniques are applied, with no implications for the argument.<sup>9</sup>

## Empirical Results

Table 1 presents the main results of Foster and Székely (2001).<sup>10</sup> The table reports the value of the elasticity estimated through equation (1), from five separate regressions, corresponding to the use of a different general mean as dependent variable (“t” statistics are included under the coefficient). The results are quite striking since the lower the value of  $\alpha$ , the smaller the elasticity. In other words, the greater the weight attached to the incomes of the poorest individuals, the smaller the gains from growth. For instance,  $\mu_0$  applies a slightly greater weight than  $\mu_1$  to lower

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<sup>7</sup>For instance, when an observation for certain year is missing, Ravallion and Chen (1997) use the distribution of the closest year available, and apply the average income of the target year to produce an estimate of poverty for that specific year. Another example is that when a country-year observation in the Deininger-Squire data has a Gini coefficient but no information on the quintile income shares, Dollar and Kraay (2000) estimate the quintile shares.

<sup>8</sup>Specifically, Dollar and Kraay (2000) use the Arellano and Bover (1995) estimator, which is similar to GMM estimators but does not include fixed effects.

<sup>9</sup>Lundberg and Squire (2000) use a variant of the forward differencing method to estimate a set of simultaneous equations that deal with the problem of reverse causality.

<sup>10</sup>To perform the estimation the Huber iteration is used to reduce the effect of outlier observations.

income individuals, but the difference in weights between the poorest of the poor and individuals close to the mean is not very large. The elasticity of 1.08 suggests those individuals close to the middle of the distribution gain significantly more than one-to-one with growth in the mean. However, once greater weight is given to lower incomes, the elasticity becomes smaller. For  $\mu_{-2}$ ,  $\mu_{-3}$ , and  $\mu_{-4}$ , the elasticity is 0.77, 0.36 and 0.33, respectively, and in all cases, the coefficients are statistically insignificant. The conclusion is that living standards at the bottom of the distribution improve with growth, but that the poor gain proportionally much less than the average individual.

Table 1: **Growth Elasticity of General  
(Independent Variable is Growth in Mean)**

<b>Dependent Variable</b>	<b>Full Sample</b>
General Mean with Parameter = 0	1.08
	8.11
General Mean with Parameter = -1	0.93
	4.56
General Mean with Parameter = -2	0.77
	1.58
General Mean with Parameter = -3	0.36
	0.33
General Mean with Parameter = -4	0.33
	0.22
Number of Observations in Each Regression	123

Source: Foster and Székely (2001).

\*Each of the elasticities reported is estimated from a separate regression.

The conclusions from Table 1 are at odds with the recent papers by Roemer and Gugerty (1997), Gallup, et al. (1999), and Dollar and Kraay (2000), which argue that the poor gain one-for-one from growth in mean income.<sup>11</sup> A straightforward question is whether the differences are due to the fact that those authors use the Deininger-Squire database, while the sample of countries and years reported here is different. To explore this possibility the household surveys in Appendix Table A1 are used to compute the average income of individuals in the bottom 20, 10, and 30 percent of the distribution and equation (1) is estimated by using each of these as dependent variables.<sup>12</sup>

Table 2 presents the results. The first line reports the growth elasticity of the mean income of individuals in the first quintile, which is the dependent variable used by the other authors. An estimate of 1.03, which is higher than the elasticity of 1.019

<sup>11</sup>It must be said, however, that Timmer (1997) obtains a growth elasticity for the per capita income of individuals in the bottom 20 percent of the distribution that is significantly smaller than one, and which is similar to the elasticity we obtain for  $\mu_{-2}$ . Interestingly, Timmer uses the same data and similar econometric techniques as the authors of these papers.

<sup>12</sup>Household incomes are adjusted to match PPP GDP per capita.

and 0.92 reported by Dollar and Kraay (2000), and Roemer and Gugerty (1997), respectively, is obtained, but the elasticity is lower than the elasticity of 1.16 in Gallup et al. Some of these authors report more than one estimate, but we choose the ones that use the same methodology as in Table 1.

Table 2: **Growth Elasticity of Various Welfare**  
(Independent Variable is Growth in Mean)

<b>Dependent Variable</b>	<b>Full Sample</b>
Average Income Poorest Quintile	1.03
	9.21
Average Income Poorest Decile	0.92
	7.34
Average Income Poorest 30%	1.06
	11.76
Headcount Ratio	-1.49
	-5.10
Poverty Gap Index	-2.09
	-5.28
Number of Observations in Each Regression <sup>123</sup>	

Source: Foster and Székely (2001).

\*Each of the elasticities reported is estimated from a separate regression.

Interestingly, when the cutoff point is moved down, the elasticity declines. The second line in Table 2 reports the growth elasticity of the per capita income of individuals in the first decile. For every 10 percent increase in average income, the mean among the poorest 10 percent grows by 9.2 percent. When the cutoff is moved up to the 30<sup>th</sup> percentile, the elasticity is 1.06 (third line in the table). So, the lower the section of the distribution under examination, the smaller the gains from growth. The differences among percentiles 10, 20, and 30 are consistent with the results in Table 1 that when greater weight is given to lower incomes, the growth elasticity is smaller.

Table 2 also includes the growth elasticity of the headcount ratio and the poverty gap index. These measures are included in order to determine whether the use of the data base in Appendix Table A1 leads to the same conclusion as those obtained by Ravallion and Chen (1997) and Bruno et al. (1998) with respect to the effect of growth on these two poverty measures.<sup>13</sup> The estimate of the growth elasticity of the headcount ratio and the poverty gap is of -1.49, and -2.09, respectively. Both coefficients are statistically significant. The elasticities are smaller than those in Ravallion and Chen (-3.12 and -3.69 for the headcount ratio and the poverty gap, respectively), but are of very similar magnitude than those obtained by Morley

<sup>13</sup>To compute the headcount ratio and the poverty gap, a poverty line of 2-dollars-a-day PPP adjusted to 1985 prices is used, and as before, survey incomes are blown up to make them equal to PPP-adjusted GDP per capita so that they are comparable with the relative poverty measures and the results for the general means.



(2000) and De Janvry and Sadoulet (2000), who use a sample restricted to Latin American countries. These comparisons suggest that the headcount ratio and the poverty gap are less responsive to growth in Latin America. But in any case, the conclusions derived from Table 2 are still in line with those of Ravallion and Chen.

Therefore, the results confirm previous findings: (i) that the growth elasticity of per capita incomes in the first quintile is roughly equal to 1; and (ii) that the proportion of poor and the poverty gap decline significantly with growth. The use of a different data set and the inclusion of data from consecutive years does not explain why the general means lead to a different conclusion. The explanation is the difference in methodology.<sup>14</sup>

### **Conclusions**

This paper argues that the use of different methodologies for characterizing the well-being of the poor can lead to totally different views about the relationship between economic growth and poverty. Specifically, using general means for this characterization, rather than other measures, such as the income of the bottom 20 percent of the income distribution, shows that growth is good for the poor, but not necessarily as good as for other sectors of the population.

The point is illustrated by reporting results from an extensive empirical application involving household surveys from 20 countries over a quarter century. Previous results in the literature are replicated, and a growth elasticity of about 1 is estimated for the income of the lowest 20 percent in the sample of countries. It is then reported that growth elasticities for the general means for  $\alpha < 1$  are significantly below 1, suggesting that when the lowest incomes receive greater emphasis (as they do with the general means) then the effect of growth on the poor is not quite as strong as previously thought. The positive value of the elasticity indicates that growth is good for the poor. However, it seems that it is even better for other sectors of society. This suggests a role for additional policies aimed specifically at guaranteeing that the poor share the benefits of development more proportionally.

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<sup>14</sup>In Foster and Székely (2001), a set of robustness tests are applied. The results survive changes in sample composition (that is, restricting the sample to developing countries and to Latin America only, and to shorter time periods); changes in estimation procedure (instrumental variables, corrections for measurement error for low incomes, omitted variables bias, use of non-PPP-corrected incomes); and changes in empirical specification (through the inclusion of additional regressors).

Appendix Table A1: **Household Surveys**

<b>Country</b>	<b>Number of Surveys</b>	<b>Years</b>	<b>Survey</b>
Argentina	3	1980, 96, 98	Encuesta Permanente de Hogares
Bolivia	7	1986 1990, 93, 95 1996, 97	Encuesta Permanente de Hogares Encuesta Integrada de Hogares Encuesta Nacional de Empleo Encuesta Continua de Hogares (condiciones de vida)
Brazil	11	1981, 83, 86, 88 1992, 93, 95, 96, 97, 98, 99	Pesquisa Nacional por Amostra de Domicilios Pesquisa Nacional por Amostra de Domicilios
Chile	6	1987, 90, 92, 94, 96, 98	Encuesta de Caracterización Socioeconómica Nacional
Colombia	6	1991, 93, 95, 97, 98, 99	Encuesta Nacional de Hogares – Fuerza de Trabajo
Costa Rica	10	1981, 83, 85 1987, 89, 91, 93, 95, 97, 98	Encuesta Nacional de Hogares – Empleo y Desempleo Encuesta de Hogares de Propósitos Múltiples
Dominican Republic	2	1996 1998	Encuesta Nacional de Fuerza de Trabajo Encuesta Nacional Sobre Gastos e Ingresos de los Hogares
Ecuador	2	1995, 98	Encuesta de Condiciones de Vida
El Salvador	3	1995, 97, 98	Encuesta de Hogares de Propósitos Múltiples
Guatemala	1	1998	Encuesta Nacional de Ingresos y Gastos Familiares
Honduras	6	1989, 92, 96, 97, 98, 99	Encuesta Permanente de Hogares de Propósitos Múltiples
Mexico	7	1977 1984, 89, 92, 94, 96, 98	Encuesta de Ingreso y Gasto de los Hogares Encuesta Nacional de Ingreso y Gasto de los Hogares
Nicaragua	2	1993, 98	Encuesta Nacional de Hogares Sobre Medición de Niveles de Vida
Panama	6	1979 1991, 95, 97, 98, 99	Encuesta de Hogares - Mano de Obra (EMO) Encuesta Continua de Hogares

Appendix Table A1: (continued)

<b>Country</b>	<b>Number of Surveys</b>	<b>Years</b>	<b>Survey</b>
Paraguay	2	1995 1998	Encuesta Nacional de Empleo Encuesta Integrada de Hogares
Peru	5	1985, 91, 94, 97, 2000 1996	Encuesta Nacional de Hogares sobre Medicion de Niveles de Vida Encuesta Nacional de Hogares sobre Niveles de Vida y Pobreza
Uruguay	6	1981, 89 1992, 95, 97, 98	Encuesta Nacional de Hogares Encuesta Continua de Hogares
Venezuela	8	1981, 86, 89, 93, 95, 97, 98, 99	Encuesta de Hogares por Muestra
United States	23	1976 - 1998	Current Population Survey
Thailand	8	1975, 81, 86, 88, 90, 92, 94, 96	Socio - Economic Survey
Taipei, China	21	1976 - 1996	Survey of Family Income and Expenditure

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# Growth and Poverty Reduction: An Empirical Analysis

Nanak Kakwani

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**Abstract.** *This paper develops an inequality-growth trade off index, which shows how much growth is needed to offset the adverse impact of an increase in inequality on poverty. The empirical analysis based on this index shows that pro-poor policies will have a greater payoff for poverty reduction in Thailand, while growth-maximizing policies may be more adequate for Korea and Lao PDR. For the Philippines, a mixture of growth and pro-poor policies may be deemed as adequate. Further, the paper shows that countries with low initial inequality will have a greater poverty reduction payoff from growth, whereas countries with high initial inequality will have a greater poverty reduction payoff from pro-poor policies. Finally, the paper suggests that if our focus is on ultra poverty, then pro-poor policies would be of greater benefit.*

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## Introduction

**H**ow sensitive is the incidence of poverty to economic growth? This issue has been the subject of extensive research in recent years. A large amount of cross-country evidence suggests that growth and poverty reduction are strongly positively correlated. This result is consistent with the “trickle down” theory that some benefits of growth will always trickle down to the poor. Thus, the incidence of poverty can diminish with growth even if the poor receive only a small fraction of total benefits.

A recent World Bank study by Dollar and Kraay (2000) has come out with a much stronger result that the income of the poor rises one-for-one with overall growth. It means that the proportional benefits of growth enjoyed by the poor are the same as those by the nonpoor. An important implication of this research is that growth is good for the poor irrespective of the nature of growth. Thus, governments

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need not follow pro-poor policies with a focus on poverty reduction. To achieve a rapid reduction in poverty, they should focus on maximizing economic growth while maintaining macroeconomic stability.

The World Bank study, although highly influential, is based on cross-country regressions, which can indicate only the average trends. Individual country experiences can be quite different. We cannot have the same policy prescriptions for all countries. For some countries, the growth-maximizing policies may be adequate but for other countries, there may be a need to have pro-poor growth policies with a focus on reducing inequality (for a detailed discussion of pro-poor growth see Kakwani and Pernia 2000).

The degree of poverty depends upon two factors: average income and income inequality. The increase in average income reduces poverty and the increase in inequality increases it. Thus, the change in poverty can be decomposed into two components: one is the growth component relating to change in mean income, and the other is the inequality component relating to change in inequality. The magnitudes of two components provide the relative sensitivity of poverty reduction to growth and inequality. It is obvious that if the growth component dominates over the inequality component, then growth-maximizing policies may be adequate in achieving a rapid reduction in poverty. If the inequality component dominates, then the policies that are pro-poor and thus reduce inequality should be adopted.

The main objective of the present paper is to measure the tradeoff between inequality and growth, which shows how much growth is needed in order to offset the adverse impact of an increase in inequality on poverty. The magnitude of this tradeoff is estimated for four countries, namely, Republic of Korea (Korea), Thailand, Lao PDR, and Philippines. These four countries are at different stages of development and will require different policies to achieve a rapid reduction in poverty. The magnitude of the inequality–growth tradeoff gives an indication of the policies that individual countries should follow.

### **Economic Growth and Poverty Reduction**

Suppose income  $x$  of an individual is a random variable with distribution function given by  $F(x)$ . Let  $z$  denote the poverty line, then  $H = F(z)$  is the proportion of individuals whose income falls below the poverty line or  $H$  is the proportion of poor in the society.  $H$  is the most popularly used poverty measure and is called the headcount ratio.

The headcount ratio is a crude measure of poverty. The percentage of the population that is poor does not reflect the intensity of poverty suffered by the poor. A suitable measure of poverty should take into account the following three indicators of poverty:

- (i) percentage of poor
- (ii) aggregate poverty gap
- (iii) distribution of income among the poor

A general class of a poverty measure, which combines these three characteristics of poverty can be written as

$$\theta = \int_0^z P(z, x) f(x) dx \quad (1)$$

where  $f(x)$  is the density function of  $x$  and

$$\frac{\partial P}{\partial x} < 0, \frac{\partial^2 P}{\partial x^2} > 0, P(z, z) = 0$$

and  $P(z, x)$  is a homogenous function of degree zero in  $z$  and  $x$ .

Foster, Greer, and Thorbecke (1984) proposed a class of poverty measures that is obtained by substituting

$$P(z, x) = \left( \frac{z - x}{z} \right)^\alpha \quad (2)$$

in (1), where  $\alpha$  is the parameter of inequality aversion. For  $\alpha = 0$ ,  $\theta = H$ , that is, the headcount ratio. This measure gives equal weight to all poor irrespective of the intensity of their poverty. For  $\alpha = 1$ , each poor is weighed by his or her distance from the poverty line, relative to  $z$ . This measure is called the poverty gap ratio. For  $\alpha = 2$ , the weight given to each poor is proportional to the square of his or her income shortfall from the poverty line. This measure is called the severity of poverty ratio. This measure satisfies all the three indicators of poverty stated above.

The degree of poverty depends on two factors: the average level of income and the extent of inequality in income distribution. Thus a poverty measure can always be written as

$$\theta = \theta(\mu, L(p)) \quad (3)$$

where  $\mu$  is the mean income of the society and  $L(p)$  is the Lorenz function measuring the relative income distribution.  $L(p)$  is the percentage of income that is enjoyed by the bottom  $p$  percent of the population.



The growth effect measures the effect of a change in  $\mu$  on  $\theta$  when  $L(p)$  remains constant. On the other hand, the redistribution (or inequality) effect measures the effect of a change in  $L(p)$  on  $\theta$  when  $\mu$  remains constant. The total effect of economic growth on poverty can be decomposed into two factors: (i) the impact of growth when the inequality does not change, and (ii) the impact of change in inequality when the mean income of the society is kept constant. The measures of these two effects are presented in the next two sections.

### **Growth Effect**

To measure the growth effect, Kakwani (1993) derived the elasticity of  $\theta$  with respect to  $\mu$ , keeping  $L(p)$  fixed. This elasticity is given by

$$\eta_{\theta} = \frac{1}{\theta} \int_0^{\epsilon} x \frac{\partial P}{\partial x} f(x) dx \tag{4}$$

which is always negative in view of  $\frac{\partial P}{\partial x} < 0$ . For the headcount measure  $P(z,x) = 1$ , the elasticity is derived as

$$\eta_H = -\frac{zf(z)}{H} < 0 \tag{5}$$

which is the percentage of poor who will cross the poverty line as a result of a 1 percent growth in the mean income of the society.

Substituting (2) into (4) gives the elasticity of the Foster, Greer, and Thorbecke class of poverty measures denoted by  $\theta_{\alpha}$  with respect to  $\mu$  as

$$\eta_{\alpha} = \frac{\partial \theta_{\alpha}}{\partial \mu} \cdot \frac{\mu}{\theta_{\alpha}} = -\frac{\alpha(\theta_{\alpha-1} - \theta_{\alpha})}{\theta_{\alpha}} \tag{6}$$

for  $\alpha \neq 0$ , which will always be negative because  $\theta_{\alpha}$  is a monotonically decreasing function of  $\alpha$ . This elasticity for the poverty gap ratio is obtained by substituting  $\alpha = 1$  in (6), which gives

$$\eta_1 = -\frac{\mu^*}{(z - \mu^*)} \tag{7}$$

where  $\mu^*$  is the mean income of the poor.

The magnitude of  $\eta_1$  depends on  $\frac{\mu^*}{z}$ , which measures the depth of poverty.

The smaller is  $\frac{\mu^*}{z}$ , the greater is the depth of poverty. It can be noted that the

absolute magnitude of elasticity in (7) is an increasing function of  $\frac{\mu^*}{z}$ , from which we may conclude that the impact of economic growth on poverty reduction (when inequality does not change) is smaller (larger) when the depth of poverty is larger (smaller).

### Inequality Effect

$\eta_\alpha$  is the pure growth elasticity, measuring the impact of economic growth on poverty reduction when the inequality of income (measured by the Lorenz curve) does not change with growth. However, economic growth may increase or decrease inequality. Growth may be called pro-poor if it reduces inequality so that the poor benefit proportionally more than the rich.

The measurement of the effect of inequality on poverty is a difficult task because inequality can change in infinite ways. Here we follow Kakwani (1993) and make a simple assumption that the entire Lorenz curve shifts. Using this assumption, the elasticity of poverty with respect to the Gini index can be written as

$$\epsilon_\theta = \frac{1}{\theta} \int_0^z \frac{\partial P}{\partial x} (x - \mu) f(x) dx, \quad (8)$$

which shows that if the economic growth leads to an increase in the Gini index by 1 percent, the incidence of poverty will increase by  $\epsilon_\theta$  percent, provided the poverty line is less than the mean income  $\mu$ .

For the Foster, Greer, and Thorbecke poverty measures, the inequality elasticity is given by

$$\epsilon_\alpha = \mu + \frac{\alpha \theta_{\alpha-1}}{\theta_\alpha} \times \frac{(\mu - z)}{z} \quad (9)$$

For  $\alpha \neq 0$ . This elasticity for the poverty gap ratio is obtained by substituting  $\alpha = 1$  in (9), which gives

$$\varepsilon_1 = \frac{(\mu - \mu^*)}{(z - \mu^*)} \quad (10)$$

which will always be positive.

It can be seen that  $\varepsilon_1$  increases monotonically with  $\left(\frac{\mu^*}{z}\right)$ , which implies that the adverse impact of increase in inequality on poverty will be larger (smaller) when the depth of poverty is smaller (larger).

### **Tradeoff between Inequality and Poverty**

Economic growth increases mean income, which has an impact of reducing poverty. If economic growth also increases inequality, then poverty increases. What is the tradeoff between inequality and growth? If the Gini index increases by 1 percent, how much should be the growth rate in order that poverty does not increase? The total proportional change in poverty may be written as

$$\frac{d\theta}{\theta} = \eta_\theta \frac{d\mu}{\mu} + \varepsilon_\theta \frac{dG}{G} \quad (11)$$

where the first term in the right-hand side measures the impact of growth on poverty (affecting the mean income) and the second component measures the impact of change in the Gini index on poverty. Equating the total proportionate change in poverty to zero, we obtain the inequality–growth tradeoff index (IGTI) as

$$\text{IGTI} = \phi_\theta = \frac{\partial\mu}{\partial G} \times \frac{G}{\mu} = -\frac{\varepsilon_\theta}{\eta_\theta} \quad (12)$$

If, for example, IGTI is equal to 3.0, it means that a 1 percent increase in the Gini index will require a growth rate of 3 percent in order to offset the adverse impact of increase in inequality. It also means that by following pro-poor policies, if we can reduce the Gini index by 1 percent, then this policy is equivalent to having an additional 3 percent growth rate. This suggests that the larger the IGTI, the greater will be the benefits of following pro-poor policies that would reduce inequality.

The IGTI for the Foster, Greer, and Thorbecke class of poverty measures is given by

$$\phi_{\alpha} = \frac{z\theta_{\alpha} + (\mu - z)\theta_{\alpha-1}}{z(\theta_{\alpha-1} - \theta_{\alpha})} \quad (13)$$

Substituting  $\alpha = 1$  in (13) gives the IGTI for the poverty gap ratio as

$$\theta_1 = \frac{(\mu - \mu^*)}{\mu^*}$$

which is clearly a decreasing function of  $\mu^*$ . This means that the greater the poverty depth, the larger the IGTI. Thus, in the countries, where poverty depth is higher, then pro-poor policies will be more effective in reducing poverty.

### Empirical Analysis

The methodology developed herein is applied to four countries, namely, Korea, Thailand, Lao PDR, and Philippines. These countries are at different levels of development with different levels of poverty and inequality. Korea and Thailand are cited as tiger economies in the Asian and Pacific region. Their per capita GDP growth has been on average over 6 percent for a long period of time until the economic crisis in mid-1997 brought a halt to their impressive growth performance. Although both countries have experienced a rapid reduction in poverty, Korea's performance in poverty reduction has been much superior (Kakwani and Son 2000). Korea achieved high growth while maintaining low inequality whereas Thailand achieved high growth but at the cost of acquiring high inequality. The Philippines's performance in both growth and poverty reduction has not been so good compared with Korea and Thailand. While its growth rate has been much lower, it has maintained a high level of inequality and also high incidence of poverty. Lao PDR is the poorest of the three countries. Almost 45 percent of the population were identified as poor in 1992-1993; fortunately the percentage of poor declined to about 38.7 percent in 1997-1998 (Kakwani 2000b). The rapid poverty reduction was achieved due to an average annual growth rate of 4.6 in the per capita real GDP during the past five years.

Poverty elasticity was computed using the unit record data for the four countries. To compute the elasticity we need to know the poverty threshold for each country. We utilized the threshold for each of the four countries (Kakwani and Prescott 1999 for Korea, Kakwani and Krongkaew 2000 for Thailand, Kakwani 2000a for the Philippines and Kakwani 2000b for Lao PDR). The values of growth and inequality elasticity along with the IGTI index are presented in Table 1.

Table 1: **Growth and Inequality Elasticity and their Tradeoff**

Countries	Poverty Gap Ratio			Severity of Poverty Ratio		
	Growth Elasticity	Inequality Elasticity	IGTI	Growth Elasticity	Inequality Elasticity	IGTI
Thailand, 1998	-2.94	11.96	4.07	-3.27	16.65	5.10
Philippines, 1998	-1.83	4.25	2.32	-2.15	6.77	3.14
Korea, 1998	-3.52	4.32	1.23	-3.76	6.24	1.66
Lao PDR, 1997-1998	-2.41	2.27	0.94	-2.90	3.83	1.32

IGTI means inequality–growth tradeoff index.

The value of IGTI for Thailand is computed to be 4.04 (for the poverty gap ratio), which means that an increase of 1 percent in the Gini index will require a growth rate of about 4 percent in order that the incidence of poverty does not change. It also means that a reduction of inequality by 1 percent is equivalent to having a growth rate of 4 percent. This result suggests that a strategy of inequality reduction will have greater payoff for poverty reduction than the strategy of promoting economic growth. This cannot be said for Korea and Lao PDR. The values of the IGTI for Korea and Lao PDR are 1.23 and 0.94, respectively. These results suggest that the payoff for the strategy of inequality reduction in these countries is much lower and therefore the growth maximization may be adequate for them to achieve a rapid reduction in poverty. For the Philippines, the value of IGTI is 2.32, which is much lower than that of Thailand but much higher than that of Korea and Lao PDR. Thus for the Philippines, a mixture of growth and pro-poor policies may be deemed as appropriate.

How does the initial level of inequality affect the choice of policies? To see this effect, we generated a new income distribution by uniformly shifting the Lorenz curve of the original income distribution downward by 5 percent so that the new distribution had the same mean income as the original distribution but a 5 percent higher value for the Gini index. This new distribution is referred to as the distribution with high inequality. Similarly, we generated a low inequality distribution by uniformly shifting the Lorenz curve upward by 5 percent, which will have a 5 percent lower value for the Gini index. The original income distribution is referred to as the distribution with medium inequality. We computed the IGTI for the three income distributions. The empirical results given in Table 2 show that the value of IGTI increases monotonically with inequality; the higher the inequality, the greater the value of IGTI. This result holds for all the four countries. From these results, we may conclude that the countries with a higher initial level of inequality may be able to reduce poverty more rapidly by following inequality-reducing policies. The countries with low initial inequality can afford to follow growth-maximizing policies.

Table 2: **Growth and Inequality Elasticity and their Tradeoff for Different Levels of Initial Inequality**

Countries	Poverty Gap Ratio			Severity of Poverty Ratio		
	Growth Elasticity	Inequality Elasticity	IGTI	Growth Elasticity	Inequality Elasticity	IGTI
<b>Thailand, 1998</b>						
Low Inequality	-4.22	15.52	3.68	-4.84	21.03	4.34
Medium Inequality	-2.94	11.96	4.07	-3.27	16.65	5.10
High Inequality	-2.08	9.56	4.60	-2.23	13.78	6.17
<b>Korea, 1998</b>						
Low Inequality	-4.02	4.69	1.17	-4.37	6.68	1.53
Medium Inequality	-3.52	4.32	1.23	-3.76	6.24	1.66
High Inequality	-3.06	3.98	1.30	-3.25	5.86	1.80
<b>Lao PDR, 1997-1998</b>						
Low Inequality	-2.73	2.39	0.88	-3.31	3.97	1.20
Medium Inequality	-2.41	2.27	0.94	-2.90	3.83	1.32
High Inequality	-2.13	2.17	1.02	-2.55	3.70	1.45
<b>Philippines, 1998</b>						
Low Inequality	-2.27	4.75	2.10	-2.75	7.45	2.71
Medium Inequality	-1.83	4.25	2.32	-2.15	6.77	3.14
High Inequality	-1.49	3.86	2.59	-1.69	6.23	3.69

IGTI means inequality-growth tradeoff index.

Do we need to follow different policies when our focus is on reducing ultra poverty? To investigate this question, we computed the IGTI for the ultrapoor, who are defined as those having a lower poverty line. The poverty line was uniformly reduced by 20 percent. The calculated values of the IGTI for the poor and ultrapoor are presented in Table 3.

It is noted that the value of IGTI is uniformly higher for the ultrapoor compared to those for the poor. This suggests that inequality-reducing policies will be more beneficial for the ultrapoor than for the poor. Thus, if our focus is on reducing ultra poverty, then we should be more inclined to adopt pro-poor policies.

**Table 3: Growth and Inequality Elasticity and their Tradeoff for Poor and Ultrapoor**

Countries	Poverty Gap Ratio			Severity of Poverty Ratio		
	Growth Elasticity	Inequality Elasticity	IGTI	Growth Elasticity	Inequality Elasticity	IGTI
<b>Thailand, 1998</b>						
Poor	-2.94	11.96	4.07	-3.27	16.65	5.10
Ultrapoor	-3.35	17.21	5.14	-3.67	23.13	6.30
<b>Korea, 1998</b>						
Poor	-3.52	4.32	1.23	-3.76	6.24	1.66
Ultrapoor	-3.82	6.63	1.74	-4.09	9.12	2.23
<b>Lao PDR, 1997-1998</b>						
Poor	-2.41	2.27	0.94	-2.90	3.83	1.32
Ultrapoor	-3.05	3.90	1.28	-3.38	5.86	1.73
<b>Philippines, 1998</b>						
Poor	-1.83	4.25	2.32	-2.15	6.77	3.14
Ultrapoor	-2.17	6.35	2.92	-2.45	9.50	3.87

IGTI means inequality–growth tradeoff index.

### Conclusion

A simple message of this paper is that we cannot have the same policies for all countries. For some countries, growth-maximizing policies may be adequate and for others, there may be a need to have pro-poor policies focusing on reducing inequality. The choice of policies may be made based on the inequality–growth tradeoff index, which has been developed in the paper. The empirical analysis shows that pro-poor policies will have a greater payoff for poverty reduction in Thailand, while growth-maximizing policies may be more adequate for Korea and Lao, PDR. For the Philippines, a mixture of growth and pro-poor policies may be deemed as adequate.

Further, the paper indicates that the initial level of inequality is important in determining the appropriate policies for a country. Countries with low initial inequality will have a greater poverty-reduction payoff from growth, whereas countries with high initial inequality will have a greater poverty-reduction payoff from pro-poor growth.

Finally, the paper suggests that the poverty-reduction payoff from growth is lower for the ultrapoor than for the poor. Thus, if our focus is on reducing ultra poverty, then pro-poor policies would be of greater benefit.

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# Growth Strategies and Poverty Reduction

Siddiqur Rahman Osmani

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**Abstract.** *Recent evidence confirms the existence of a positive growth-poverty nexus—sustained growth almost invariably leads to sustained reduction of poverty. The mere existence of this nexus, however, does not suggest what kind of growth strategy is best suited for poverty reduction. This paper shows that there can exist important trade-offs between growth and poverty reduction so that the policies that maximize the rate of growth need not always maximize the rate of poverty reduction. Evaluation of alternative growth strategies shows that the so-called win-win policies that maximize growth and poverty reduction at the same time are not plentiful. However, experience shows that the combination of policies that promote agriculture at the early stages of development and redistribute assets, especially human capital, toward the poor within a relatively open trade regime can go a long way toward combining rapid growth with rapid reduction of poverty.*

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## Introduction

The 20th century has witnessed unprecedented success in improving the living standards of people in most parts of the world. As the *Human Development Report 1997* succinctly observed, “In the past 50 years poverty has fallen more than in the previous 500” (UNDP 1997). The same period has also witnessed historically unprecedented increases in the overall economic prosperity of nations, as reflected, for example, in the growth of per capita national income. There can be little doubt that these two phenomena are very closely connected. By raising the level of personal incomes of the poor and by expanding the resource base of social provisioning, sustained economic growth laid the foundations on which the impressive record of poverty reduction of the past half century has been achieved.

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But this simple cause-and-effect relation—which may be called the growth–poverty nexus—does not exhaust all there is to learn about the relationship between growth and poverty reduction. If growth is to serve the cause of poverty reduction to the best of its potential, a number of related questions need to be answered.

Does a strategy that maximizes the rate of growth also represent the best strategy for reducing poverty? Or is there a tradeoff between maximizing the rate of growth and maximizing the rate of poverty reduction? What kind of growth-promoting policies are best suited to the goal of poverty reduction—in other words, can some growth strategies be classified as more pro-poor than others? In what ways, if at all, might the pro-poor growth strategies be different for different countries depending on their particular circumstances, including their initial conditions and the stage of development? Does the ability of growth to reduce poverty depend on the initial conditions of a country, in particular, on its initial income distribution? These are some of the questions the paper attempts to answer.

The paper is structured as follows. The second section examines the empirical evidence on the relationship between growth and poverty reduction. There has been a good deal of debate in the past on whether economic growth is an effective vehicle for reducing mass poverty at a rapid pace. Until recently, this debate generated more heat than light, at least partly because it was based on fragmentary and often inaccurate data. The database has improved quite significantly over the last decade, however, and recent studies based on improved data sets clearly demonstrate that sustained economic growth leads to sustained poverty reduction, thus establishing the existence of a strong and positive growth–poverty nexus.

The paper goes on to argue, however, that the mere existence of a positive growth–poverty nexus does not imply that maximizing the rate of growth is always the right strategy for maximizing the rate of poverty reduction. This point is made in the third section with the help a conceptual framework that explores the relationship between growth and poverty, using a set of relationships among growth, inequality, and poverty based on statistical evidence and theoretical arguments found in the literature. This framework shows that there are plausible scenarios in which the strategy of achieving the most rapid rate of growth may conflict with the objective of poverty reduction. This is presented not as an argument for abandoning growth per se, but as an argument against aiming at the maximal possible rate of growth regardless of circumstances.

While recognizing the importance of growth for poverty reduction, there still remains the question of what kinds of growth strategy are best suited to poverty reduction. The remainder of the paper is concerned with this question. Three different growth strategies are evaluated in terms of their potential for poverty reduction: the strategy of outward-oriented trade and industrial development (fourth section), the strategy of agriculture-led growth (fifth section), and redistributive

reform as a growth strategy (sixth section). Some concluding observations are offered in the final section.

### **Impact of Growth on Poverty: Statistical Evidence**

In the late 1960s and the 1970s, it was fashionable to hold a skeptical view on the impact of growth on poverty. This skepticism was based on the notion that, barring fundamental socioeconomic changes, the process of economic growth will tend to tilt income distribution in favor of the rich, leaving little benefit for the poor. This notion derived support from the well-known Kuznets hypothesis, which claimed that as per capita national income rises from low initial levels, inequality first rises and then falls, giving rise to an inverted U-shaped relationship between income and inequality (Kuznets 1955). The original Kuznets hypothesis was based on the historical experience of developed countries. But its significance for the relationship between growth and poverty inspired a series of similar statistical investigations into the conditions obtaining in developing countries in the 1970s and the 1980s.<sup>1</sup>

One major problem with these early studies was that they were based on highly questionable distribution data. Most of them drew upon the compendia of data compiled by Paukert (1973) and Jain (1975), who had put together data from a large number of countries and for different points in time. It has all along been known, however, that most of these data were not comparable to each other, as some of them were derived from sample surveys while others were nonsurvey estimates. Even the surveys were of different types: some with national coverage and others with only partial coverage of the population, some dealing with distribution of total household income and others dealing with only wage income, and so on.

Over the last decade or so, much effort has been made, mostly under the auspices of the World Bank, to remedy this situation and to create a comparable set of distribution data.<sup>2</sup> Fields (1989a) made a first attempt. He retained only those distribution data that (i) were based on household surveys rather than estimates drawn from national accounts statistics or other aggregate sources, and (ii) represented the whole population, rather than a part such as rural, or urban, or taxpayers, etc. However, many of the surveys he retained referred to the distribution of only wage income, rather than a comprehensive measure of either income or expenditure. This last deficiency has been removed by two new data sets, one created by Ravallion et al. (1991), Chen et al. (1994), Ravallion (1995), and Ravallion and

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<sup>1</sup>The findings of these early studies have been competently reviewed by Adelman and Robinson (1988) and Fields (1989b), among others.

<sup>2</sup>Outside the World Bank, an independent attempt to construct a comparable data set was made by Ram (1988), but subsequent work has largely ignored this set.

Chen (1997); and the other by Deininger and Squire (1996a).<sup>3</sup> Although far from ideal, these data sets have for the first time made it possible to compare poverty and inequality across time and countries with a reasonable degree of consistency.

At the same time, internationally comparable income data has also become available in the form of Summers-Heston purchasing-power-parity-adjusted national income estimates. The simultaneous availability of the refined distribution data on the one hand and comparable national income data on the other has given impetus to a new wave of cross-country investigation of the relationship between income, distribution, and poverty. A great deal of new work has been done over the last decade or so. These can be classified into two groups: those that investigate the impact of growth on inequality and thus indirectly shed light on the growth-poverty nexus, and those that directly investigate the nexus itself.

### **On the Growth-Inequality Relationship**

The hypothesis at issue here is the rising part of the Kuznets curve. If inequality rises with income at the early stage of development, then it is quite possible that growth will bypass the poor in developing countries. Indeed, as noted before, the skeptical view on the relationship between growth and poverty drew its sustenance mainly from the rising part of Kuznets curve. But the current wisdom regarding the Kuznets hypothesis is that it can be dismissed for all practical purposes. Three kinds of evidence have been marshaled in support of this dismissal.

The first set of evidence comes from cross-country regressions using single observations for each country at a point in time. The most recent of such regressions, which are based on the new improved distribution data sets described above, have found no evidence for the existence of rising inequality at the lower end of the income scale (e.g., Deininger and Squire 1996b, Ravallion 1995, Ravallion and Chen 1997).<sup>4</sup>

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<sup>3</sup>The main difference between them is essentially that Ravallion et al. (1991) apply more stringent criteria than Deininger and Squire. For instance, they accepted only those surveys where they had either raw or tabulated data from which they could themselves calculate poverty and inequality, whereas Deininger and Squire accepted inequality estimates from "reliable" secondary sources. Furthermore, Ravallion's distribution data are all converted in terms of fractiles of persons whereas in the Deininger-Squire set some are fractiles of persons and others are fractiles of households. Finally, while the Deininger-Squire set includes observations from the 1950s onwards, Ravallion and his colleagues do not use any pre-1980 data on the grounds that the quality of surveys has so vastly improved in most developing countries since 1980 that the new surveys are hardly comparable with the old ones even when they are based on the same methodology. Both these sets are being periodically updated and further refined.

<sup>4</sup>This is in contrast with the earliest cross-country regressions which did find such evidence using data for the 1960s and early 1970s (e.g., Adelman and Morris 1973, Ahluwalia 1976, Loehr and Powelson 1981), but in agreement with most of the later studies that used data for more recent periods (e.g., Bourguignon and Morrisson 1990, Papanek and Kyn 1987, Anand and Kanbur 1993). Bruno et al. (1998) speculate that earlier studies showing the upward rising part of the Kuznets curve were subject to an omitted variable bias, namely, a country-fixed effect arising from differences in the nature of data. In the earlier decades, low-income countries in Asia used consumption surveys, while richer Latin American countries used mostly income surveys; and since consumption inequality is naturally lower than income inequality, low income got to be associated with low inequality. As Asian economies are becoming richer, this effect is now getting blurred.

Secondly, time series evidence for a number of countries shows that as per capita income has risen in most countries, inequality has shown no systematic pattern of change. It has fallen in about as many cases as it has risen (Fields 1989b, Deininger and Squire 1997).

The third set of evidence comes from cross-country panel regressions involving countries that have comparable distribution data for at least two points in time. Using such data, Ravallion and Chen (1997) regressed the change in the Gini coefficient on change in per capita income (or expenditure), and found no systematic relationship between the two.<sup>5</sup> In a similar vein, several authors have regressed change in per capita income of the bottom quintiles of the population on change in per capita GDP and have found a positive coefficient that is not significantly different from unity. This means that if per capita GDP goes up, then per capita income of the bottom quintiles also rises in same the proportion, indicating that inequality remains stable in the face of rising per capita GDP (Roemer and Gugerty 1997, Gallup et al. 1998).

The Kuznets curve is thus nowhere to be seen. There is, however, another version of Kuznets's hypothesis, which is also relevant in the present context. While the original hypothesis related inequality to the level of income, this version relates inequality to the rate of growth of income, i.e., inequality is supposed to go up as the rate of growth of income goes up. But even this version finds little empirical support. For instance, using new improved distribution data, Fields (1989b) has found no systematic relationship across countries between the direction of change in inequality over time and the rate of growth of income.<sup>6</sup>

Thus neither the original version nor the rate-of-growth version of the Kuznets' hypothesis finds empirical support, especially from the new improved distribution data sets. These findings undermine the skeptical view on the relationship between growth and poverty, for if growth does not tend to create a more unequal distribution of income, then in general there is no reason to suspect that it will fail to reduce poverty.

### **On the Growth–Poverty Relationship**

Strictly speaking, poverty may fail to decline with rising per capita income even if distribution remains unchanged by some measure of inequality, if, for example, worsening of distribution at the lower tail is offset by an improvement in the middle income range at the expense of the very rich. But this rarely happens in actuality. This is confirmed by studies that have attempted to test directly the relationship

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<sup>5</sup>In fact, the authors did find a significant relationship, but a negative one, for the full sample. However, further analysis showed that the negative relationship owed itself entirely to the inclusion of the transition economies of Eastern Europe and Central Asia, who are in a rather special situation. Once these countries are removed from the regression, the coefficient turns out to be insignificant.

<sup>6</sup>Earlier, Ahluwalia (1974) and Fields (1980) had reached the same conclusion using older and more limited data.

between growth and poverty. For instance, using the new improved data sets for distribution and poverty across a large number of countries and over a period of time, Fields (1989b) and World Bank (1990) have found that only in exceptional cases did higher income entail a rise in poverty.<sup>7</sup>

The evidence further shows that the exceptional cases in which poverty did rise despite rising income tended to be associated with slow growth of income. This was demonstrated by Fields (1989b) by assembling data for all countries that had comparable distribution surveys for at least two points in time. He defined the experience of a country between two successive surveys as a “spell”, and for each spell for each country he then observed the direction of change in poverty and calculated the growth rates of per capita income. His data revealed that poverty declined in all but one spell with growth rate above 3 percent, and the cases of rising poverty were concentrated in spells with growth rates of less than 3 percent. A probit regression across the spells confirmed that higher growth rate was associated with higher probability that poverty will decline.

Recently, Roemer and Gugerty (1997) carried out a similar exercise with the Deininger-Squire data set, which is both bigger and more refined than the one utilized by Fields. As indicator of change in poverty during a spell, they measured the change in the average income of the bottom two quintiles of the population, and observed that out of 39 spells with growth rates of more than 2 percent, only six were characterized by rising poverty.<sup>8</sup>

These findings suggest that rising per capita income will generally lead to lower poverty, especially if the rate of growth is sustained at a reasonably high rate, which on current evidence would mean not less than 2-3 per cent per annum.

Some recent studies have gone one step further and attempted to quantify the responsiveness of poverty to income growth by estimating the “growth elasticity” of poverty, i.e., the percentage change in poverty due to a 1 percent change in per capita income. For instance, Ravallion and Chen (1997) have found that the head-count index of poverty has a growth elasticity of -3.1, i.e., a 1 percent increase in per capita income was associated with a 3.1 percent reduction in poverty.

The same authors have also found that when alternative poverty lines were used to measure the incidence of poverty, the estimated growth elasticity was higher for lower poverty lines. The implication is that the incidence of extreme poverty was even more responsive to growth in average living standards than the incidence of moderate poverty. In other words, not only does growth help the poor, it apparently helps the poorest of the poor more than the moderately poor. Other authors such as Deininger and Squire (1996b), Roemer and Gugerty (1997), Timmer (1997), and

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<sup>7</sup>Similar findings, based on older data, were reported by Ahluwalia et al. (1979) and Fields (1980).

<sup>8</sup>These six spells were People’s Republic of China (1986-92), Colombia (1970-78), Costa Rica (1971-77 and 1983-89), Dominican Republic (1984-89), and Greece (1981-88).

Gallup et al. (1998) have come to the same conclusion using somewhat different methodologies.<sup>9</sup>

These are quite remarkable findings. Together with the evidence presented earlier on the relationship between growth and inequality, these findings fly in the face of the skeptical opinion often voiced in the 1970s that economic growth in the developing world tends generally to bypass the poor, especially the poorest among the poor. The new evidence suggests strongly that growth does help the poor, including the poorest of the poor.

### **Rate of Growth, Pattern of Growth, and Pro-Poor Growth Strategies: Some Conceptual Issues**

One obvious conclusion that follows from the preceding discussion is that it is time to ditch once for all any vestiges of antigrowth attitude that might still linger among those concerned for the poor. Growth is a powerful ally of the poor, not their enemy. There remains the question, though, of exactly what conclusions are to be drawn from this evidence as regards the choice of a growth strategy.

One facile interpretation of the evidence would be that since growth has a positive impact on poverty reduction, the strategy of maximizing the rate of growth would constitute a pro-poor growth strategy par excellence. This was indeed the underlying logic of the “growthmanship” of the 1950s and the 1960s. The explicit objective was to maximize the rate of growth, in the implicit belief that this was also the best strategy for helping the poor. The newly revived faith in the power of growth shares this objective of maximizing the rate of growth; in fact, the statistical evidence discussed above is now seen as a strong justification for pursuing this objective. We shall argue, however, that from the point of view of rapid poverty reduction, pursuit of the most rapid rate of growth may not always be the best growth strategy.

A growth strategy may be defined as a set of policies designed to promote economic growth by allocating resources, either indirectly by molding the structure of incentives, or directly by redistributing resources between different sectors of production as well as between different owners of factors of production. Depending on the allocation of resources induced, any given growth strategy will lead to a certain rate of growth and a certain distribution of income among individuals. These effects on the rate of growth and the distribution of income—which together can be

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<sup>9</sup>One exception to this finding has been noted by Demery and Squire (1996). In an evaluation of several structural adjustment programs implemented in sub-Saharan Africa during the late 1980s and early 1990s, they found that as economic growth revived in countries that successfully implemented these programs, the poor have generally gained, but the poorest of the poor have sometimes become worse off. It is arguable, however, that what happens during the traumatic economic dislocations caused by economic crises and by the harsh medicine of structural adjustment designed to overcome those crises cannot perhaps be taken as representative of what happens in the normal process of economic growth.

described as the “pattern of growth” induced by a growth strategy<sup>10</sup>—will determine the impact the strategy will have on the rate of poverty reduction. Different growth strategies will differ in their impact on poverty because they will induce different patterns of growth defined as above. We shall argue that the strategy of maximizing the rate of growth will not always induce the most pro-poor pattern of growth.

The argument is developed below with the help of a stylized model, but it needs to be emphasized that the model is used here for illustrative purposes only. The model captures only a few of the many causal links that may exist between growth and poverty in any specific economy, but it serves well enough to establish the general points we wish to make. The discussion proceeds in two steps. Under certain assumptions about the economy, we first establish a relationship between growth and distribution, and then use it to establish a relationship between growth and poverty.

### **A Stylized Model**

Consider an economy in which output depends on both physical and human capital. A homogenous commodity is produced, which is either consumed or saved. The savings can be invested in either physical or human capital, and human capital is produced with the help of both physical and human capital.

We now make two important assumptions about the structure of the economy. First, we assume in the spirit of the two-sector model developed by Rebelo (1991) that the production process of the two forms of capital is characterized by differential factor intensities. In particular, human capital production is assumed to be more intensive in the use of human capital compared to the production of consumption-cum-investment good. Secondly, we assume that the poor have a lower propensity to save compared to the rich.

The first assumption establishes a link between the pattern of growth (i.e., whether human or physical capital accumulation is emphasized more) and the rate of savings. Output can be increased by the accumulation of either human or physical capital, but because of differential factor intensities, the route of output growth via physical capital accumulation involves greater reliance on savings than the alternative route through human capital accumulation.

The second assumption helps establish a relationship between savings and income distribution. It ensures that if the rate of savings is to be pushed very far, then it will become essential at some point to change the distribution in favor of the rich

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<sup>10</sup>Note that on this definition, there is no sense in maintaining the traditional dichotomy between “the rate of growth” and the “the pattern of growth” that is often found in the literature, because the rate of growth is subsumed under the notion of pattern of growth. This point is further developed below.



through measures such as tax/subsidy schemes, price interventions, or outright asset redistribution, etc.<sup>11</sup>

Combining the two assumptions, we can establish a relationship between growth and distribution via the mechanism of saving. If growth is pursued mainly via human capital accumulation, then the savings requirements will remain low (by the first assumption). As a result, it will be possible to accelerate the rate of growth with little or no change in income distribution (by the second assumption). Recall, however, that one needs human capital to produce human capital; so the rate of human capital accumulation will be constrained by the size of the existing stock of human capital.<sup>12</sup> Therefore, beyond a certain point, further acceleration of growth will require a switch to the route of physical capital accumulation and hence a much greater savings effort, which at some stage will necessitate a worsening of income distribution (by the second assumption).<sup>13</sup> We thus have the following relationship between growth and inequality.

Up to a point, growth can be accelerated with little or no worsening of income distribution by following a growth strategy that relies relatively heavily on human capital accumulation, but as the growth rate is pushed further, inequality will have to rise because growth will then have to rely more heavily on physical capital accumulation.

Assuming for simplicity that income distribution does not worsen at all so long as human capital accumulation can be relied upon as the main engine of growth, we can graphically illustrate the growth-inequality relationship as a kinked line as in Figure 1.<sup>14</sup> In this diagram, rates of growth are shown on the horizontal axis and initial inequality is shown on the vertical axis. At a given level of inequality  $I_1$ , the rate of growth can be accelerated up to  $G_1$  without any change in inequality, but for growth rates higher than  $G_1$ , inequality rises monotonically (as the required savings rate rises monotonically with increasing reliance on physical capital accumulation.)

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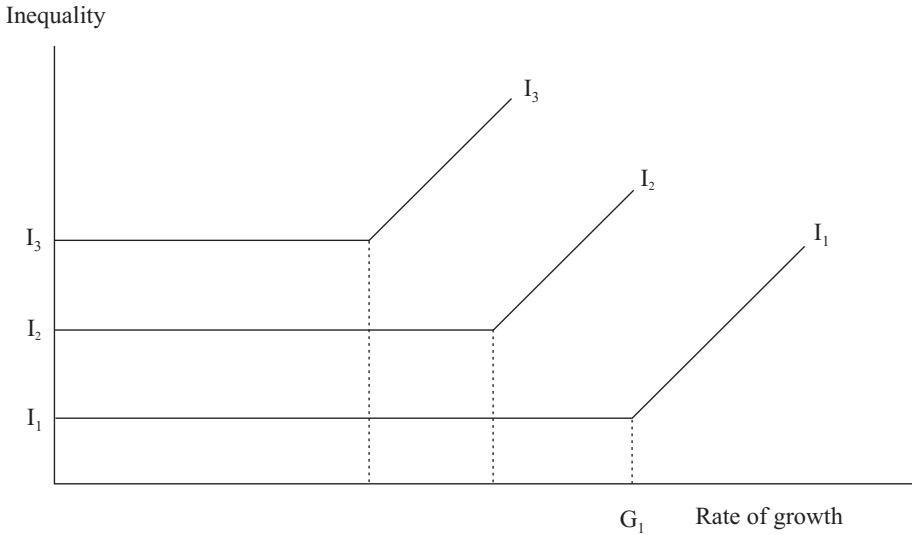
<sup>11</sup>Generalizing this idea, many development economists have argued that, barring a fundamental change in existing property relations, growth can only be accelerated in developing countries by enriching the already rich industrialists and landowners. See, for example, Griffin and Khan (1972) and Sheehan (1980).

<sup>12</sup>The idea that the existing stock of human capital constrains the rate of human capital accumulation is central to the explanation of persistent differences in the growth of nations offered by Lucas (1988) in his pioneering model of endogenous growth. Note that this idea is also valid in an open economy context because of the political and cultural barriers that restrict the movement of people, as distinct from the movement of commodities and capital, across geographical boundaries.

<sup>13</sup>This conclusion has also been reached by Galor and Tsiddon (1996) within the framework of a human capital model with credit constraint, but following a somewhat different line of reasoning than the one presented here.

<sup>14</sup>In fact, there is no *a priori* reason why the frontier cannot have a downward segment, i.e., there is no reason why inequality cannot fall when human capital accumulation is being used as the main engine of growth. Allowing for this possibility will not, however, alter the essence of our argument.

Figure 1



Any point on the kinked line is a feasible combination of growth and inequality. Note, however, that points above the line are also feasible. For instance, a point above the line could be reached by pursuing a growth strategy that yielded the same growth rate as given by a point vertically below, but relying more heavily on physical capital and less on human capital accumulation and therefore leading to higher inequality. The points on the kinked line thus represent the lowest levels of inequality that are feasible at given rates of growth. In this sense, the kinked line can be described as the growth-equity frontier of an economy with initial inequality  $I_1$ , and the growth rate  $G_1$  associated with the kink can be described as the threshold growth rate beyond which higher growth rates will necessarily entail higher inequality, other things remaining the same. As noted earlier, the threshold rate will depend on the size of the existing stock of human capital.

The growth-equity frontier will not be identical for all economies. It will depend, among other things, on the initial level of inequality. The argument turns on a link between inequality and human capital accumulation in the presence of credit market imperfections.<sup>15</sup>

The story goes something like this. The poor have lower levels of human capital than the rich; therefore, given the standard assumption of diminishing returns to capital, the poor would normally have a greater propensity to acquire human capital

<sup>15</sup>This link has been explored by a number of recent studies that purport to show that equality can be helpful for growth (e.g., Galor and Zeira 1993). Other mechanisms linking initial distribution with human capital formation also exist. These issues are further discussed in the sixth section below.

than the rich. But the poor happen to be credit-constrained while the rich are not; so unlike the rich, the poor cannot make optimal investments in health, education, etc. The actual size of the poor's suboptimal investment depends on their command over self-finance. Naturally, their command over self-finance will be higher in a society with greater initial equality of income distribution than in one with less equality, for a given level of per capita national income. Therefore, a more equal society will be able to accumulate more human capital, other things remaining the same.

Now recall that an economy's stock of human capital has an influence on its threshold growth rate, i.e., the larger the stock, the higher the threshold. It follows that a more equal economy will have a higher threshold rate of growth than a more unequal economy, other things remaining the same. The horizontal segment of the growth-equity frontier will therefore be longer for an economy with lower initial level of inequality (Fig 1).

All this can now be translated in terms of the relationship between growth and poverty reduction. What happens to poverty when growth rate picks up depends to a large extent on what happens to inequality. If inequality does not rise, as in the horizontal segment of the growth-equity frontier, faster growth will necessarily entail faster reduction of poverty. Even when inequality does rise, as in the upward-sloping segment of the growth-equity frontier, faster growth may still entail faster reduction of poverty so long as inequality rises only modestly in relation to growth. But if inequality rises sharply in relation to growth, i.e., if the rising segment of the growth-equity frontier is very steep, then beyond a certain point on the rising segment faster growth may well entail slower reduction of poverty.

This last scenario is demonstrated in Figure 2. For each growth-equity frontier in Figure 1, there is a corresponding frontier in Figure 2 relating growth rates with rates of poverty reduction. Thus, the frontiers  $P_1$ ,  $P_2$ ,  $P_3$  in Figure 2 correspond to the frontiers  $I_1$ ,  $I_2$ ,  $I_3$  in Figure 1.<sup>16</sup> Each frontier of Figure 2 is initially upward rising, but after the growth rate crosses the threshold corresponding to the kinks in Figure 1, at some stage the frontier begins to slope downwards. The growth rate up to which the frontier keeps on rising is higher for economies with lower initial levels of inequality.

These ideas on the relationship between growth and poverty may be summarized in the form of the following three propositions:

**Proposition P.1:** So long as the rate of growth remains below the threshold corresponding to the kink of the growth-equity frontier, faster growth will reduce poverty faster.

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<sup>16</sup>As drawn (lower frontiers in Figure 1 correspond to higher frontiers in Figure 2), these figures assume that at any given rate of growth the rate of poverty reduction is higher for economies with lower initial level of inequality. This assumption is justified by the empirical finding of Ravallion (1997) discussed in the sixth section.

**Proposition P.2:** If the rate of growth is pushed too far above the threshold, faster growth may eventually lead to slower reduction of poverty, depending on how steeply inequality happens to rise and how far the rate of growth is pushed.

**Proposition P.3:** Other things remaining the same, lower initial inequality enhances an economy's opportunity to pursue high growth rates without causing a slowdown in the rate of poverty reduction.

### **The Rate of Growth versus the Pattern of Growth: A False Dichotomy**

The second of the three propositions established above alerts us to the possibility that there may exist a tradeoff between the objective of maximizing the rate of growth and the objective of maximizing the rate of poverty reduction. In much of the recent literature on growth and poverty, it is recognized that the rate of growth is not the only thing that matters for poverty reduction, the pattern of growth also matters. But this recognition does not fully capture the message we are trying to convey. What is usually meant by this recognition is that a given rate of growth may be achieved in different ways, each with different implications for income distribution and poverty reduction. The policy prescription that follows from this recognition is that we should try to combine the strategy of maximizing the rate of growth with a set of policies that would induce the most pro-poor pattern of growth. There is no recognition here that sometimes the rate of growth may itself have to be compromised a little in order to have the maximum possible impact on poverty, which is precisely the point we are trying to make here.

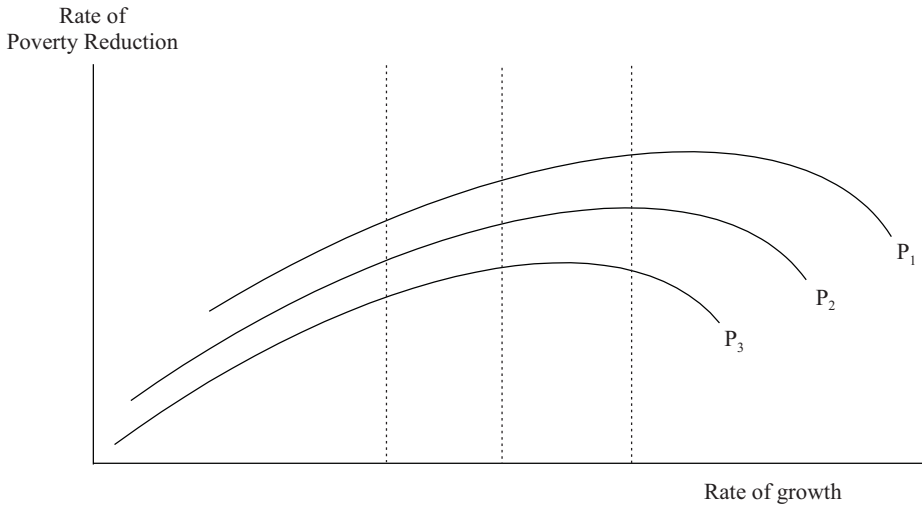
Underlying the traditional view that the "pattern of growth also matters" is an untenable dichotomy between the rate of growth and the pattern of growth. This dichotomy must be abandoned if the possibility of a tradeoff between growth and poverty is to be contemplated. This point is best clarified by noting that in the framework of the model developed above the notion that "growth pattern also matters" can have three distinct meanings, and the traditional notion usually refers to just one of them.

The first meaning is that for any given growth rate, some patterns of growth will be more conducive to poverty reduction than others. For example, a growth pattern that relies on greater labor intensity of production would be more helpful than one that relies on greater capital intensity. This is the standard meaning. In terms of our framework, it means that the growth pattern associated with a point on a frontier in Figure 2 is more conducive to poverty reduction than a point directly below. The policy advice then is that one should always try to be on the frontier rather than inside it.

This is sound advice, but it does not exhaust the meaning of "growth pattern also matters". In our framework, growth pattern matters not just because it affects

poverty for given rates of growth, but also because it affects poverty through its influence on the rate of growth itself. In other words, the choice of growth pattern determines not just whether an economy will be on or inside its frontier but also where on its frontier it will be. This choice matters because some points on the frontier are better than others; in particular points closer to the peak of a frontier (see Figure 2) are better than points away from the peak, on either side. So, from the point of view of poverty reduction, the most desirable growth patterns are those that enable an economy to remain in the vicinity of the peak. This is the second sense in which the phrase “growth pattern also matters” can be understood.

Figure 2



The third meaning relates to the fact that the frontier itself is amenable to policy choices and to the growth patterns engendered by those choices. The scenario in which higher initial equality will extend the horizontal segment of the growth-equity frontier (Figure 1) would lengthen the rising segment of the growth-poverty-reduction frontier (Figure 2), allowing the economy to accelerate the growth rate further without causing a decline in the rate of poverty reduction. A growth strategy that is bold enough to embrace a degree of egalitarian asset redistribution will help the poor in two ways: directly, by allowing them to earn higher income by using their newly acquired assets, and indirectly, by expanding the economy’s opportunity to pursue faster growth without sacrificing egalitarianism. It is this effect on the opportunity to pursue rapid but egalitarian growth that constitutes the third meaning of “growth pattern also matters”.

It should be clear that once all three meanings are recognized, it no longer makes sense to maintain the traditional duality that poverty depends on both the rate of growth and the pattern of growth. The pattern of growth is all there is to it, because the rate of growth itself is predicated on the pattern of growth. All one needs for analytical purposes, therefore, is a broad notion of “growth pattern” as defined above—one that determines not only whether an economy will be on or off the frontier but also where on the frontier it will be and what shape the frontier itself will take. The evaluation of alternative growth strategies in terms of their impact on poverty should then proceed by asking what kinds of growth patterns, broadly defined, are induced by each strategy. It is in this spirit that we attempt below an analysis of the poverty impact of several alternative growth strategies that have figured prominently in the past and current literature on development economics.

### **Trade Policy and the Growth–Poverty Nexus**

In recent discussions on what constitute pro-poor patterns of growth, outward-orientation of the economy has come to occupy a pride of place. Policy advice from official development agencies as well as the dominant strand of academic literature emphasizes that the pursuit of an open trade regime that does not discriminate against tradables in general and exports in particular, and perhaps actively promotes them, is essential for achieving pro-poor growth in developing countries.

This view represents quite a reversal of the attitude toward free trade that dominated the discussion on economic development around the 1950s, when the colonial era was coming to an end. At that time, to advocate an open trade regime for a typical developing country was seen as being tantamount to advocating the perpetuation of a colonial pattern of trade that was evidently not pro-poor. The essential characteristic of colonial trade was the existence of a small export-oriented sector that specialized in a narrow range of crops and mineral products destined for the markets of western developed economies and had very little linkage with the rest of the domestic economy, where most of the poor people eked out a subsistence living. In this dualistic setting, an open trade regime would have entailed little gain for the majority of the poor people.<sup>17</sup> This line of thinking was instrumental in bringing about the restrictive trade regimes that fostered inward-looking, import-substituting industrialization in most developing countries in the immediate post-war years.

In retrospect, it is fair to say that the fear that outward orientation would perpetuate the colonial pattern of trade in post-colonial countries was unduly exaggerated. To a large extent the colonial pattern of trade was an artificial construct fostered

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<sup>17</sup> Indeed, it has been argued by some that the pursuit of open trade regime in the context of colonial trade actually harmed the poor in many cases as the trade-induced expansion of the enclave—in the shape of an expanding plantation economy—encroached on the land of the peasant economy (e.g., in Sri Lanka).

and propped up by colonial rulers for their own advantage; therefore, its persistence was not a necessary consequence of free trade in a post-colonial state. It is true that the particular specializations that underpinned colonial trade had an economic rationale in terms of comparative advantage based on natural resource endowments, and to that extent there was nothing artificial about it. What was artificial though was, firstly, the enclave nature of export production with little or no linkage to the overall economy and, secondly, persisting with the same specialization decade after decade with no attempt to diversify the economic structure or to climb the technological ladder through dynamic comparative advantage. The policies and institutions that helped sustain these adverse features were part and parcel of colonial rule, but post-colonial states did not have to carry them around.

Unfortunately, many of them did, especially in Sub-Saharan Africa, where most of the economies have continued to remain heavily dependent on the colonial pattern of trade. This has become a lingering source of economic distress as the terms of trade of their “colonial” exports have plummeted over the last few decades. Yet, it is arguable that such dependence was not inevitable. In recent years, Malaysia, and to a lesser extent Botswana, have shown how countries can take advantage of the colonial pattern of trade rather than be stymied by it, by adopting policies that promote linkages and diversification. Malaysia, in particular, has used its colonial legacy to great advantage by using it as a springboard for graduating into a more mature and diversified economy. The contribution made by its “colonial” exports to easing the foreign exchange constraint has helped in no small measure to transform Malaysia into the rapidly industrializing country that it is today.

Most of the developing countries, however, failed to emulate this pattern. Instead, the fear of trade led them to raise protective walls behind which inefficient import-substituting industries were nurtured indefinitely. The accumulated evidence has clearly demonstrated the folly of this response: if the colonial pattern of trade was no friend of the poor, its replacement by inward-looking import-substituting industrialization was not of much help to the poor either.<sup>18</sup>

This was so for two reasons. First, this kind of industrialization could not ensure lasting growth. After an initial burst, growth petered out as inefficiency became entrenched and the domestic market served by inefficient industries became saturated; obviously, short-lived growth of this kind could not provide a lasting basis for long-term poverty reduction. Second, such growth as occurred tended to bypass the poor, as the capital-intensive nature of import-substituting industrialization inhibited the growth of employment and wages.

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<sup>18</sup>It should be stressed, however, that the folly did not consist in the adoption of import substitution as such because in a late industrializing country industrialization cannot but proceed by substituting imported goods with at least some early protection; the problem lay in the failure to transform the protected industries into competitive ones.

The tide has now turned in favor of outward-looking export-oriented growth, so much so that it is now claimed by many to be an essential element, if not the most important component, of any strategy for pro-poor growth. The argument is in two parts. First, growth of this kind will be both rapid and sustainable and hence will provide a lasting basis for poverty reduction. Second, the pattern of growth will be especially helpful for the poor as it will promote labor-intensive production. In short, growth is expected to be both rapid and egalitarian. In terms of the conceptual framework developed in the third section, outward orientation should enable an economy to get closer to the growth-equity frontier while accelerating the rate of growth.

### **Trade and Distribution**

The standard argument that outward-oriented growth is especially beneficial for the poor is based on the simplest version of the Heckscher-Ohlin theory of comparative advantage. In a two-commodity two-factor world, characterized by perfect competition and free factor mobility within a country, this theory predicts that more open trade will promote the production of those commodities in which a country's more abundant resources are used more intensively. For a developing country with abundant labor and little capital, this typically means that trade will promote labor-intensive production, which should benefit the poorer segment of the population who have mainly their labor power to sell.

But the picture can be quite different in a more elaborate version of the theory, which allows for more than two factors and two commodities. Consider, for example, a three-factor world, in which a country is more abundantly endowed with land (natural resources) relative to labor and capital. Trade will promote specialization in land-intensive products in that country, and if capital happens to be complementary to land (as in mineral production), then freer trade may actually make the laborers poorer even though the country may have relatively more abundant labor compared to its trading partners. The existence of nontraded goods may also lead to a similar result if the nontraded sector happens to be more labor-intensive than the export sector.

Despite these theoretical ambiguities, the empirical evidence has generally been believed to offer overwhelming support to the simplest version of Heckscher-Ohlin theory. This evidence came largely from East Asia, where during the 1960s and 1970s employment and real wages of labor increased at an unprecedented rate, and the wage differentials between unskilled and skilled labor narrowed down. Some doubts have recently emerged, however, in light of the recent experience of Latin America where the wage differential between unskilled and skilled labor has widened in several countries following the opening up of their trade regimes (Robbins 1996).



Of course, greater wage inequality among unskilled and skilled workers does not necessarily imply that the poor unskilled workers of Latin America have lost out in absolute terms. The effect on absolute wages would depend on the mechanism underlying the widening of wage differentials. Two hypotheses have been suggested in this context, which try to explain the contrasting experience of East Asia in the 1960s and 1970s and that of Latin America in more recent years.

One hypothesis is based on the notion of technological bias. It starts from the premise that opening up of trade enables a country to absorb better the latest technologies that are available in the world market. It then suggests that technology has become more skilled-biased in recent years, so that countries that are opening up only recently are absorbing more skill-biased technologies than did countries that opened up a couple of decades earlier (Robbins 1996). The other hypothesis is based on the notion of effective factor proportions in the world economy. It begins by noting that the effective world supply of unskilled labor has increased enormously in recent years with the entry of large poor countries like Bangladesh, People's Republic of China, India, and Indonesia into the world market. As a result, the middle-income countries of Latin America now find that their comparative advantage lies in commodities that are intensive in medium-skilled as opposed to unskilled labor (Wood 1997).

As Wood (1997) notes, the two hypotheses have two very different implications for the absolute wages of unskilled workers. The technological bias hypothesis allows that absolute wages might rise even though relative wages will fall, while the effective factor proportions hypothesis implies that both absolute and relative real wages will fall under standard assumptions. Empirical evidence has so far been unable to discriminate between these two hypotheses. One cannot be sure that freer trade has disadvantaged the poor unskilled workers of Latin America, but one can infer from the evidence of widening wage inequality that trade has failed to exert as strong a poverty-reducing effect in Latin America as it did in East Asia.<sup>19</sup>

The impact on poverty would of course depend not just on wage inequality but on the overall inequality of personal income distribution. It is, therefore, of interest to know what impact opening up of trade has had on overall inequality in the developing countries. The theoretical ambiguities discussed earlier as well as the divergent experience of East Asia and Latin America in respect of wage inequality suggest that one is unlikely to find a general pattern. This is confirmed by a cross-country analysis by Edwards (1997) in which changes in inequality between the 1970s and 1980s were regressed on changes in trade orientation along with a number of control variables (e.g., change in secondary education, inflation, GNP growth, and initial trade distortion). Several alternative measures were used to quantify the degree of trade distortion and the changes therein; all measures yielded similar results. The

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<sup>19</sup>For a fuller discussion of the impact of trade on income distribution in both developed and developing countries, see Bhagwati (1998).

overall finding was that "...countries that initially had a more distorted external sector experienced an increase in inequality; trade reform, however, does not appear to have significantly affected changes in income distribution" (Edwards 1997, 209). In yet another cross-country study, Gallup et al, (1998) failed to uncover even the association between initial distortion and subsequent change in distribution. Using the openness indicators devised by Sachs and Warner (1995, 23), this study concluded that: "Foreign trade openness is just as good for the incomes of the poor, on average, as for the rest of the population."

The problem of causality no doubt bedevils these studies. Yet, they permit at least the negative conclusion that existing empirical evidence does not provide any support for the view that greater trade orientation leads inevitably to greater equality within developing economies. It then follows that any impact trade orientation might have on poverty will operate principally via growth. This is corroborated by a recent cross-country study by Stryker and Pandolfi (1997). They related changes in poverty as measured by human development indicators such as schooling, malnutrition, life expectancy, etc. to a number of policy and structural variables and found that greater trade orientation had no effect on poverty independently of its effect through growth.

### **Trade and Growth**

This leads us to consider the impact of trade orientation on growth. The recent success of East Asian economies has lent popularity to the idea that outward orientation is the key to rapid economic growth. The fact that these economies have achieved phenomenal growth of income along with equally phenomenal growth of exports has been interpreted by many as a vindication of standard economic theory's prediction regarding the virtues of free trade. But this inference is being increasingly questioned on both theoretical and empirical grounds.

In the first place, the standard theory of trade actually says rather little about the effect of trade on growth. The virtue of free trade that this theory claims is simply a once-for-all rise in income stemming from static efficiency gains; nothing about the rate of growth can be inferred directly from this. In fact, when the standard theory of trade is combined with the standard neoclassical theory of growth, it can be shown that freer trade will do nothing to raise the steady-state rate of growth. It will, however, raise the steady-state level of income, and will also ensure a higher transitional rate of growth during the period when the economy is approaching the steady state (Corden 1971).

From the perspective of the standard neoclassical theory, therefore, greater trade orientation can be given credit only for a temporary acceleration of growth. Of course even a temporary acceleration is no mean achievement if it is sharp enough and can last for long enough. After all, the East Asian economies have all but eliminated poverty by enjoying sharply accelerated growth for just two to three

decades. From the point of view poverty elimination, therefore, it hardly matters if the growth rate now begins to decelerate.

The problem, however, lies not in the temporariness but in the magnitude of acceleration that can be attributed to trade. The usual estimates of static efficiency gains that can be expected from freeing up trade are in the range of 1-2 percent of GDP, which suggests only a minuscule acceleration in the transitional rate of growth (see Havrylyshyn 1990 for a review of the evidence). With a broader notion of gains from trade (higher X-efficiency, greater capacity utilization, reduced wastage from rent-seeking, etc.) that many expect from freer trade, the estimates rise to 10-15 percent of GDP, but even that translates into less than a 1 percent acceleration in growth rate over two to three decades. Nothing spectacular can thus be claimed for the growth-enhancing effect of trade from within the standard neoclassical framework.

However, the emerging literature on endogenous growth theory allows one to say more. The open economy endogenous growth models of the kind developed by Lucas (1988) and Romer (1990) show that outward orientation can actually raise the long-run steady-state rate of growth, not just transitional growth. In these models, growth depends, *inter alia*, on the productivity-raising effect of the creation and absorption of superior technology, and trade promotes growth by facilitating this process.

One problem, however, is that the theoretical predictions of this genre of models is not always unambiguous. It is generally necessary in this class of models to replace the standard assumption of perfect competition with that of imperfect competition; when this is done, trade can be shown, under certain assumptions, to hamper technological progress and reduce the rate of growth (e.g., Helpman and Krugman 1989, Rodrik 1992).

The more serious difficulty lies on the empirical side. All attempts to demonstrate the growth-enhancing effect of trade have come up against serious methodological and factual problems. Many studies have demonstrated positive cross-country correlation between growth of exports and growth of income, but they have generally left open the question of the direction of causality. One study that did explore the issue of causality, using Granger causality tests, came up with ambiguous results; in fact, for the majority of export-oriented developing economies, causality was found to run in the opposite direction—from higher growth to higher exports (Jung and Marshall 1985). Another set of studies claims to have demonstrated the growth-enhancing effect of trade by showing a positive cross-country correlation between growth and the degree of openness of the economy (e.g., Sachs and Warner 1995, Edwards 1998). But the problem of causality still remains; furthermore, the measures of openness used in these studies have been found to have serious problems, which create ambiguity in interpreting the correlation (Rodriguez and Rodrik 1999). Some authors have argued that the best way to demonstrate the productivity-raising effect

of trade is to compare export-oriented industries with other industries within the same country. But as the reviews of the relevant evidence by Havrylyshyn (1990) and Tybout (1992) show, no clear-cut picture emerges from such comparisons either.

The most telling blow to the notion that trade promotes growth by raising productivity has come from some recent reevaluations of the East Asian experience. Using different methodologies, several authors have demonstrated that factor accumulation was the driving force behind East Asian growth and that productivity growth played a minor, if any, role (Lau and Kim 1994, Krugman 1994, Young 1995). Thus the endogenous growth perspective, which emphasizes the role of productivity growth, does not do much better than the standard neoclassical perspective, which emphasizes the role of allocative efficiency, in making a credible case for the growth-enhancing effect of trade.

It can be argued, however, that allocative efficiency and productivity are not the only channels through which trade can promote growth but may work through factor accumulation as well. Findlay (1995) has demonstrated the theoretical possibility of this channel through an ingenious marriage between the Heckscher-Ohlin theory of comparative advantage and Lewis's theory of a dual economy with surplus labor. In a labor-surplus economy, trade will lead to specialization in labor-intensive production, a la Heckscher-Ohlin; the resulting absorption of surplus labor in the modern sector will then allow rapid accumulation of capital, a la Lewis.

The quantitative significance of this process remains to be assessed, though. In the context of the East Asian economies, for instance, it has to be remembered that capital accumulation was but one element of factor accumulation that was the driving force behind growth. According to the careful growth accounting of Young (1995), accumulation of raw labor and human capital together played quantitatively a more significant role than capital accumulation. And it is not known how much of capital accumulation itself can be attributed to trade.

Nonetheless, when one considers all the probable effects of trade—operating via allocative efficiency, productivity, and capital accumulation—it is reasonable to assume that the combined effect will in general be beneficial for growth. What is not warranted on the basis of existing knowledge, however, is to assign a preeminent place to outward orientation as a stimulus to growth.

### **Trade Policy Alone is not Enough**

The new orthodoxy in trade policy expects that outward orientation will reduce poverty in two ways: by speeding up the rate of growth and by inducing an egalitarian pattern of growth. The preceding review of evidence shows, however, that while there may be cases where outward orientation induced egalitarian growth, there is no evidence that this is the general pattern in developing countries. The existing empirical studies indicate a neutral distributional impact, on the average. This

suggests that any general poverty-reducing effect must operate via the effect of outward orientation on the rate of growth of per capita income. Here again, a careful review of the evidence gives no reason to suppose that greater trade orientation can be given credit for the spectacular acceleration of growth anywhere in the developing world, including the much-vaunted countries of East Asia that are often held up as the paradigmatic case of trade-inspired growth. This is not to deny that trade orientation can promote growth, and since its distributional impact is at least neutral, on the average, it will generally help reduce poverty. But the magnitude of such impact is, by all accounts, rather modest.

Latest research shows that trade can only be a powerful force for reducing poverty, if it is accompanied by complementary policies to overcome the disadvantages of the poor. East Asia is a prime example. Outward orientation has had an especially strong beneficial effect on the poor in East Asia, only because pro-poor complementary policies such as redistributive land reforms and widespread education interacted with trade policy to create a virtuous circle of growth and poverty reduction (Birdsall et al. 1995). These policies enabled the poor East Asians to acquire the human capital necessary for participating effectively in outward-oriented activities. At the same time, open trade policies raised the return to human capital and provided further stimulus to human capital acquisition, which in turn enhanced the population's ability to gain from outward-oriented activities, thus, the virtuous circle of reinforcing growth and reducing mass poverty at the same time.

The role of complementary policies may be just as important in other parts of the developing world as well, as shown by a couple of recent model-based simulations for Zimbabwe and Morocco. In Zimbabwe, outward-oriented trade policy reform (dismantling of import and foreign exchange controls, and reduction of import taxes to a low uniform rate) is shown to increase aggregate disposable household income significantly. However the least income gain accrues to smallholder farm households, which account for about four fifths of the poor in Zimbabwe, so the equity impact is unfavorable. Model simulation shows that the twin objectives of overall income growth and poverty reduction would be achieved much more effectively, if trade liberalization were combined with effective land reform and restructuring of government expenditure and taxation (Bautista et al. 1998).

Similarly, in Morocco, trade liberalization, especially in the form of removal of nontariff barriers, is found to have strong positive aggregate effects on factor incomes and household welfare, but it disfavors the rural poor, especially in rainfed areas. When combined with complementary domestic policies such as a nondistorting transfer program that fully compensates the owners of rainfed resources and skill upgrading for the rural labor force, trade liberalization can lead to a win-win outcome: the welfare of all household groups increases significantly more rapidly than if status-quo policies are followed (Lofgren et al. 1999).

### **Sectoral Priorities from the Point of View of Pro-Poor Growth Strategies: The Case for Agriculture-led Growth**

In the early days of development economics, lively debates used to take place as to relative roles of industry and agriculture in the development process. The majority of people in the developing world, including the majority of their poor, used to live in rural areas and derive their livelihood from agricultural pursuits, which is still substantially true today. It would seem natural to think that an agriculture-focussed growth strategy would be the best way of helping the poor people of these countries. Yet, there was an influential view at that time, propounded most powerfully by Hirschman (1955), which held that these countries should emphasize industry more than agriculture. The reason, it was argued, lay in the allegedly weak linkage effects of agriculture relative to industry. It was feared that because of its poor linkage effects an agriculture-focussed growth strategy would fail to create enough dynamism in the overall economy, which in the long term would be no help to the poor after all.

Subsequent research on linkage effects has not, however, been kind to this view. Agriculture may have weaker production linkages, which is what Hirschman had focussed on, but it has been found to have very strong consumption linkages, which serve not only to generate strong growth for the overall economy but also a growth pattern that is especially favorable to the poor. The sheer size of agriculture in less developed economies ensures that a rapidly growing agriculture will create a large enough demand for nonagricultural products to provide a strong growth stimulus to the rest of the economy. And the nature of rural demand is such that it creates a bias for labor-intensive production in the overall economy, which is helpful for the employment and income of the poor.<sup>20</sup>

Yet, a revisionist view seems to be emerging in some quarters, which tends to play down the potential of an agriculture-biased growth strategy. One manifestation of this tendency is to attribute the East Asian miracle almost exclusively to export-oriented manufacturing, neglecting the role that agriculture played even before export orientation came to be the dominant feature of these economies. Another example is some recent debates on the performance of the Indian economy. India has made good progress in reducing poverty since the early 1970s where the proportion of poor population has come down from over 50 percent to just over 30 percent in two decades and a half. In certain quarters, this achievement has been attributed to the acceleration in industrial growth India has achieved in the last two decades due at least partly to economic liberalization that started slowly in the 1980s and gained momentum in the 1990s.

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<sup>20</sup>Much of the evidence as well as general discussion of the issues involved can be found in Mellor (1991), Hazell and Haggblade (1993), and Delgado et al. (1998).

Careful empirical analysis has shown, however, that the major impetus to poverty reduction came in India from agricultural growth. Several kinds of evidence point to this conclusion.

Ravallion and Datt (1996) studied the interlinkage between the sectoral composition of economic growth and the urban-rural composition of poverty, using econometric methods to disentangle the various effects within and across sectors. The main conclusion was that rural economic growth was the main contributor to national poverty reduction, through both its direct effect within the rural economy and through spillover effects on the urban economy. In particular, rural growth reduced both rural and urban poverty, while urban growth reduced only urban poverty without leaving any discernible effect on rural poverty. Thus, almost the whole of rural poverty reduction and a part of urban poverty reduction came through rural economic growth, which essentially means agricultural growth in the Indian context.

Of course, the rural-urban distinction in income growth does not quite capture the differential impact of agricultural versus industrial growth. But the above finding was confirmed when the growth of national income was broken down by output-based sectors: it was found that primary (mainly agricultural) and tertiary sector growth reduced poverty in both rural and urban areas. By contrast, secondary (mainly manufacturing) sector growth brought little gain for the poor, either urban or rural.

The overwhelming importance of agricultural growth is also revealed by an analysis of the factors that explain why certain states in India have done better than others in terms of growth and poverty reduction. Datt and Ravallion (1997) used pooled cross-section time series data (for 15 states over 21 survey rounds) to explain the differential performance of the states in terms of their agricultural growth, nonagricultural growth, and a set of initial conditions, which included physical infrastructure and human capital. Their analysis shows that agricultural growth had a significant positive effect on average consumption and negative effect on poverty in rural areas, but nonagricultural growth (rural and urban combined) had no discernible effect on rural poverty.<sup>21</sup>

The importance of agriculture for poverty reduction has also been demonstrated for the countries of Latin America. This set of evidence is especially significant, for two reasons. First, since many of the Latin American countries belong to the middle-

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<sup>21</sup>The deviation of nonagricultural output growth from the trend did, however, have a significant effect on rural poverty: when growth was above the trend, poverty declined; when growth was below the trend, poverty increased. The authors conjecture that the deviation from the trend in the state's nonagricultural output may be picking up the effects of changes in nonfarm rural demand, while the trends are dominated more by the urban economy, which as the earlier results showed had a negligible spillover effect on the rural economy. This conjecture cannot be directly verified at this stage owing to the absence of data on nonfarm rural output growth at the state level. But if the conjecture is valid, it would strengthen the claim for the overwhelming importance of agricultural growth in India, because changes in rural nonfarm demand would reflect to a large extent the various linkage effects of agricultural growth.

income rather than low-income category, one would expect a somewhat diminished role of agriculture. Second, unlike in Asia and Africa, poverty in Latin America is not a predominantly rural phenomenon. The debt and adjustment crisis of the 1980s has created a whole new class of new urban poor, but even before the crisis almost half of the poor population lived in urban areas. For both these reasons, one might have suspected that agriculture may not play a crucial role in reducing poverty in Latin America, but some recent analyses suggest otherwise.

De Janvry and Sadoulet (1995) have recently analyzed the linkage between growth, inequality, and poverty in a number of Latin American countries for the period 1970-1990. Their analysis distinguished between rural and urban poverty, and looked separately at the periods of growth and recession in order to allow for the possibility that the effect of per capita income change on poverty might differ in the two periods. A couple of their findings are especially relevant in the present context.

First, changes in agricultural value-added are significantly related to rural poverty in periods of both growth and recession, where growth reduces poverty and recession increases it. By contrast, urban poverty is sensitive only to recession but not to the growth of urban income. In other words, only agricultural growth has been effective in reducing overall poverty in Latin America, and urban income growth has played no part in this process.

Second, bias toward agriculture, as indicated by a positive deviation from the trend growth of agricultural income, had an independent effect on poverty, in addition to the effect of trend growth, especially during recessions. This means that when the overall economy was faltering, differential agricultural growth provided a source of vertical mobility.

One should be careful, however, in drawing lessons about the relative importance of agricultural growth vis-à-vis industrial growth for poverty reduction from the experience of India and Latin America. The observed relative weakness of industrial growth in these cases may lie not so much in any intrinsic inability of the industrial sector to match agriculture's capacity to reduce poverty, but in the nature of the industrial growth that has occurred. The capital-intensive nature of the predominantly import-substituting industrialization in India and Latin America has been well documented. The recent waves of liberalizing reforms may have begun to change that picture, but the reforms have been slow, incomplete, and halting. Under the circumstances, such industrial growth as has occurred must have had only a small effect on employment.

An indirect evidence of this comes from the study by Ravallion and Datt (1996), which shows that even though urban growth did reduce urban poverty to some extent, the impact was small, partly because the kind of growth that occurred led to a more unequal income distribution in urban areas. This unequalizing nature of urban growth is surely a consequence of inadequate employment creation. Given this



inability of India's industrialization to create enough employment, it is hardly surprising that industrial growth had no spillover effect on rural poverty.

More broad-based evidence is presented by Bautista and DeRosa (1996), who investigated the relative growth-promoting effects of agriculture and exports through a cross-country regression covering 94 developing countries. They related the growth of these two variables to the growth of GDP and the growth of industrialization. In order to allow for the possibility that the relative importance of the two sources of growth might change over time, the analysis was done separately for two subperiods, 1970-1980 and 1980-1993. For the first subperiod, agricultural growth was found to dominate export growth in terms of their effects on both GDP growth and the rate of industrialization. For instance, the elasticity of GDP growth with respect to agricultural growth was four times as high as the elasticity with respect to export growth. The situation was very different for the second subperiod, however. While agriculture still remained a significant determinant of growth, it no longer dominated export. For GDP growth, the two sources turned out to be equally powerful for the latter period, but for industrial growth, export growth was more than twice as powerful as agriculture.

The authors explain this role reversal by noting that by the end of the 1970s most of the fast-growing economies, especially those in East and Southeast Asia, had graduated into higher levels of economic development in which the relative importance of agriculture had declined.<sup>22</sup> Accordingly, they interpret the contrasting findings for the two subperiods as corroborating the hypothesis that an agriculture-led growth is a more powerful strategy of poverty reduction in comparison with export orientation at the early stage of economic development, when economies are still predominantly agricultural.

There are a number of methodological problems with this approach though, some of which the authors themselves recognize. The main problem is that of causality—the methodology does not allow for the possibility that causality may also run from GDP growth and industrial growth to the growth of agriculture and exports. There is also the possibility of omitted variable bias since no other variable except the two sources of growth are included in the regression. In addition, there may be a problem in treating agriculture and exports as two separate variables, because a part of the exports might originate from agriculture, as it in fact did for several of the countries in East and Southeast Asia at the early stage of their export drive. Moreover, the two sources of growth may also causally affect each other, which means that their true effects cannot be determined within a single equation framework.

Some authors have used the alternative technique of general equilibrium modeling in order to get a better hold over the causality issue. In a seminal exercise,

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<sup>22</sup>An additional factor, not mentioned by the authors, was that the rate of agricultural growth had actually decelerated in the second subperiod as compared with the first (Bautista and DeRosa 1996, Table 1).

Adelman (1984) used a computable general equilibrium model for the Republic of Korea to address the question of whether agriculture-led growth or industrial export-led growth was the superior strategy for the country. Model simulation was done over a 15-year period starting from 1963, the year around which the Republic of Korea did in fact embark on export-led growth. The agriculture-led strategy was defined as one in which the agricultural terms of trade remained constant, and agriculture's share in public investment was initially doubled and then gradually brought down to the base level by the end of the simulation period. The industrial export-led growth strategy was defined as one in which exporting sectors were given 60 percent subsidies, import tariffs were eliminated, and the domestic currency was depreciated by 10 percent.

Simulation results showed that the two strategies generated roughly the same rate of industrial growth. However, the agriculture-led strategy was found to generate a higher rate of overall GDP growth and a faster rate of poverty reduction. The latter result was a consequence of both faster output growth and a more equal distribution of income resulting from a higher rate of labor absorption. Export-led growth is expected to be labor-intensive for developing economy, but these results show that agriculture-led strategy can be even more labor-intensive. While the strategy of export-led growth has generally been credited with ensuring both rapid growth and greater equity in the Republic of Korea and other East Asian countries, Adelman's results show that the alternative strategy of laying greater emphasis on agriculture was in fact more effective on both counts.

The important role that agriculture played in both stimulating growth and reducing poverty in East and Southeast Asia cannot be overemphasized (Bautista and DeRosa 1996, Bautista 1999). In contrasting the differential performance of this region as compared to the rest of the developing world, attention has usually been focussed on their difference in trade orientation, but their difference in agricultural performance is no less revealing. In the 1970s, for instance, agriculture grew at 4-5 percent in Indonesia; Malaysia; Taipei, China; and Thailand, as against less than 3 percent in South Asia and less than 2 percent in sub-Saharan Africa. These differences in the rates of agricultural growth in the three regions correlate neatly with their differential performance in terms of both overall growth and poverty reduction.

#### *Can the Agriculture-led Strategy Avoid a Growth-Equity Conflict?*

It should be noted, however, that although rapid agricultural growth has generally been conducive to both overall economic growth and poverty reduction, it does not follow that a strategic focus on agriculture will necessarily resolve the growth-equity conflict. Much depends on the distribution of land and infrastructure. In East

and Southeast Asia, agriculture did resolve the growth-equity conflict because an egalitarian land reform and broad-based development of infrastructure allowed wide dispersion of the benefits of agricultural growth. But elsewhere, where the initial conditions were different, results could be different too.

For example, in the early days of Green Revolution in rice-based agriculture in South and Southeast Asia, it was believed by most analysts that given the unequal access to land and other resources among the rural populace, the benefits of the Revolution would be captured almost exclusively by the rich. It was feared that the poor would be left behind and may even be harmed (e.g. Bardhan 1970, Byres 1972, Griffin 1974). That view was first seriously challenged by Ahluwalia (1978a, 1978b) who ran a time-series regression between poverty and agricultural value-added for the period from 1956/1957 to 1973/1974, and found agricultural value-added to have a significantly negative relationship with poverty.

Ahluwalia's pioneering analysis was further extended and refined by others. Saith (1981), for instance, pointed out a weakness of the statistical specification used by Ahluwalia. He noted that the estimates could be subject to omitted variable bias since an important variable not included in the regression was the cost of living index whose year-to-year fluctuations could have a significant effect on poverty. At about the same time, working at the International Food Policy Research Institute, Dharma Narain was arriving at a specification similar to Saith's, but from a different direction. He wanted to explore the hypothesis that higher food prices aggravate poverty; and in order to isolate the effect of prices, he used agricultural production and time-trend as additional variables. Thus two quite different lines of enquiry converged on a common economic relationship in which poverty was related to an agricultural output variable, a price variable and a time-trend.

Narain did not live to publish his final results, but his friends and admirers have christened this relationship as the "Dharm Narain relation" and explored its statistical and economic implications in great detail in Mellor and Desai (1985). Narain's original regression has been refined and updated to 1977/1978 by Ahluwalia (1985) and Gaiha (1989), and further refined and updated to 1983 by Bhattacharya et al. (1987) and Ghose (1989). All these extensions and refinements lent support to Ahluwalia's original contention that as far as the time series evidence shows, growth tends to reduce poverty even in the specific institutional setting of rural India, which many thought would inhibit the trickle down process.

Initial cross-section evidence, however, seemed to indicate otherwise. In a pioneering work, using the National Sample Survey (NSS) data for 1977/1978, Bardhan (1985, 90-1) concluded that "...the evidence on trickle-down effects of growth on poverty are at best rather mixed and occasionally quite negative. Agricultural Growth and productivity improvements in general tend to help raise incomes all around, but certain types of growth processes generate negative forces

for the poor, particularly in an institutional setting of highly unequal distribution of assets and access to resources.”

There are, however, good reasons to suspect that the specification of his regression equations was not sharp enough to permit the kind of conclusions he reached. All that his coefficients can reveal is the distributional effect of private ownership of agricultural equipment reflecting the new technology, after abstracting from their growth-mediated effects.<sup>23</sup> If these “partial” effects have been found to be harmful for the poor, that is not ground enough for concluding that the overall effect of large-farmer dominated growth is also harmful. In fact, subsequent cross-sectional analyses that avoided this specification problem confirmed the time series finding that agricultural growth did lead to the reduction of poverty in rural India (e.g., Sundaram and Tendulkar 1988, Mahendra Dev 1988). Further confirmation has come from more recent studies using pooled cross-section and time series data, covering a long time span from the 1950s to the early 1990s (e.g., Datt and Ravallion 1998).<sup>24</sup>

Yet, there are reasons to believe that unequal access to resources did play a role in attenuating the poverty reduction effect of agricultural growth in India. In their rigorous study of the effect of agricultural growth on rural poverty in India, Datt and Ravallion (1998) have found that the bulk of the gains to the poor came through rising average income rather than improved distribution. The small amount of gain that did come from improved distribution was confined in the late 1950s and early 1960s, when agricultural growth had not yet picked up and reduction of poverty was sluggish. But when growth did pick up after 1970 and poverty began to fall appreciably, it was almost entirely the rise in average income that made poverty fall; distribution remained more or less unchanged. It is noteworthy that this was also the period when India embarked upon a series of poverty alleviation programs, most of which appear to have had some beneficial effect on poverty, as indicated by micro evidence. The fact that overall rural income distribution did not improve despite these interventions perhaps indicates that the growth process in Indian agriculture was actually unequalizing. It is just that the unequalizing effect was not strong enough to completely offset the poverty-reducing effect of rising per capita income.

Elsewhere, where land distribution is much more unequal than in India, the unequalizing effect has been stronger, and the poverty reducing effect has been

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<sup>23</sup>For example, one set of regressions showed that while growth of agricultural output tended to reduce poverty, greater use of oil engines and electric pump-sets tended to accentuate it. It also showed that regions with a higher proportion of large farmers were subject to greater poverty. Since oil engines and pump-sets tended to be privately owned by larger farmers, these findings led Bardhan to conclude that even though agricultural growth in general seems to be helpful for the poor, large-farmer-dominated growth that is dependent on private ownership of modern equipment need not be. The problem with this conclusion is that since the “growth” variable is included among the regressors, the coefficients of oil engines and pump-sets may fail to capture their growth-mediated effect on poverty.

<sup>24</sup>For detailed analysis of the poverty-reducing effect of agricultural growth spurred by Green Revolution in South and Southeast Asia, see, among others, Pinstrup-Anderson and Hazell (1985), Hazell and Ramaswamy (1991), David and Otsuka (1994), Hanumantha Rao (1994) and Osmani (1998).

correspondingly weaker. For instance, the Philippines experienced almost as rapid a rate of agricultural growth as the rest of Southeast Asia in the period 1965-1980, and yet its record of poverty alleviation is distinctly poorer, largely because of its unequal land distribution (Bautista 1995). For Latin America, the study by de Janvry and Sadoulet (1995) discussed earlier has noted that even though a sectoral bias toward agriculture contributes to faster poverty reduction, it also leads to a more unequal distribution of income, as the fruits of this bias are appropriated mostly by the rich. This finding implies that without a more equal distribution of land, the poverty-reducing effect of an agriculture-biased growth strategy will not be as strong as it otherwise could be (see also de Janvry and Sadoulet 1993).

It has been argued that quite apart from technological bias toward the rich, the phenomenon of increased commercialization of agriculture that is often induced by technological progress can also give rise to a growth-equity conflict. Several channels have been identified through which the poor can become absolutely worse-off as a result of growing commercialization.

In the first place, whatever may be the gain for the producers of cash crops, landless and near-landless people who have to depend on the market for their food may suffer from reduced availability and higher prices. The argument that higher export earnings will enable a country to maintain the level of food supply by importing food from outside may be cold comfort for them, because they may not have the purchasing power to induce the market to import basic food items instead of the relative luxuries that cash crop producers and others may desire. Thus, unless commercialization of agriculture is accompanied by public intervention to modify market supply of food—something that is not looked upon particularly favorably in the new economic environment—there is a distinct possibility that some of the land-poor households might lose out, at least in the short run.

Second, the shift from subsistence to commercial crops sometimes brings with it reduced control of women over household income. This can happen if women are relatively more involved in subsistence production and men are more involved in cash crop production as in many parts of Africa, or if women lose their title to land in the process of converting traditional food crop land into modern cash crop land. If this happens, then household food security may decline even if income rises.

Finally, households shifting toward the market in pursuit of higher income might end up exposing themselves more to sudden shocks to food security because of uncertainties in the market. It is true that even the most commercialized households tend to maintain a certain amount of subsistence production as a hedge against uncertainty. But this strategy cannot ensure that food security will not worsen. If the agents are rational, then the extent of hedging would be optimal given the information they have and the constraints they face, but optimality in this sense does not preclude the possibility that food security might worsen, it only means that things

might have been worse! Rationality and free choice are therefore no guarantee against diminished food security.

But the probable equity effects of commercialization are not all one-sided. There are pathways through which poor may actually gain. First, insofar as the shift toward the market occurs because production for the market entails higher rates of return on land and labor, such a shift will increase household income, which in turn will improve household food security. Second, experience shows that the benefit of improved technology, inputs, and infrastructure that are usually pressed into service for producing cash crops can rub off onto the production of food crops as well, so that total food production may not decline even if land and labor inputs shift away from it. Third, even if food production declines, increased export earnings from cash crops should enable a country or a region to import enough food to maintain the overall level of food availability. Finally, insofar as the shift is partial, i.e., subsistence production is not given up entirely, market orientation will contribute toward diversification of livelihood structure and thereby improve a household's ability to cope with lean times and occasional crises.

Taking all the effects together, the actual impact of commercialization on the poor has generally been found to be positive. A comparative study of commercialization in developing countries undertaken by the International Food Policy Research Institute has found that, with few exceptions, commercialization benefits the poor by generating employment and raising agricultural productivity. Both the households that are commercializing production and the hired laborers receive direct income benefits. Furthermore, in all but one study area, the increased household income generated by commercialization was associated with an improvement in the nutritional status of children in the household.<sup>25</sup>

This is not to deny that commercialization can have adverse consequences for the poor. But this generally happens when the farmers do not have secure property rights over their resources. Indeed, some of the worst cases of apparent failures of commercialization cited in the literature, such as eviction of small tenants by profit-hungry commercializing landlords, can be traced mainly to poor enforcement of property rights than to the process of commercialization itself (von Braun 1995).

Yet another possible source of unequalizing growth is widening regional disparity that may be induced by technological progress. Numerous studies on India have shown, for instance, that the states and districts that experienced more rapid infrastructural development, especially irrigation infrastructure, did better in terms of both growth and poverty reduction. Furthermore, it has been noted that the areas that were already better endowed with irrigation facilities were generally the ones that developed the facilities even more, at least in the early stage of the growth spurt. There would thus appear to exist an inherent tendency for regional disparities to

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<sup>25</sup>For an extensive review of the literature on the effects of commercialization, see among others Binswanger and von Braun (1991), von Braun and Kennedy (1994), and Dorward et al. (1998).

widen. As a consequence, the poor farmers of the laggard regions may even become absolutely worse off, if the overall effect of technological progress is to lower the prices of crops and to raise the costs of inputs.

If an impoverishing effect of this kind does exist, it would give rise to a real conflict between the objectives of growth and poverty reductions. Evidence suggests, however, that India may have been able to avoid this conflict at least since the second phase of the Green Revolution that commenced after the mid-1970s. The reason lies in the ability of the second generation Green Revolution technology to develop high yielding seeds that were suitable for rainfed areas. Since the 1980s, the adoption of high yielding varieties has proceeded the fastest in rainfed areas, and not in the irrigated areas, and that is where productivity has also grown the fastest (see the discussion in Kerr and Kolavalli 1999 and Evenson et al. 1999). As a result, widening regional disparity is no longer a necessary consequence of rapid agricultural growth.

So long as technology favored the more developed areas, the quest for rapid growth would have required concentration of public investment in those areas too, thereby reinforcing the unequalizing tendency. But in a recent study, Fan and Hazell (1997, 1999) have argued that the marginal productivity of irrigation has fallen sufficiently in the major irrigated areas of the country to warrant a new approach. Their analysis shows that the strategy of concentrating public investment in the rainfed areas now provides the best opportunity for both accelerating agricultural growth and reducing poverty. Since this strategy would bring benefits to many of the areas that were previously left behind, it would appear that reorientation of public investment is capable of generating a growth process that can avoid the growth-equity conflict.

One should, however, note that even if this conclusion is true for India, it need not be true generally. Consider the case of the PRC, for example. It is well-known that since around the mid-1980s the PRC's economic growth has been characterized by rising inequality, with the result that the rate of poverty reduction has drastically fallen in comparison with the first half of the 1980s. This rise in inequality is essentially a reflection of rising regional disparity, as regions with backward infrastructure are increasingly being left behind. Can redirection of public investment toward these lagging regions be a win-win policy as in the case of India?

The analysis of Ravallion and Jalan (1999) suggests that it might not be. The lagging areas seem to suffer from a spatial externality that makes for a lower rate of return to investment in comparison with the more advanced regions. If this is true, redirection of public investment toward these areas will involve a sacrifice of overall

growth. Yet, faster pace of poverty reduction requires that public investment should be redirected toward these areas. A growth-equity conflict obviously looms large.<sup>26</sup>

In summary, while an agriculture-led growth strategy may be the best route of reducing poverty in those developing economies that still remain predominantly agricultural, it cannot be claimed that such a strategy does not involve any growth-equity conflict. The conflict will obviously exist if land distribution is highly unequal, the property rights of the poor are not clearly defined, or technology is biased toward the more advanced regions. In any case, distributional issues must be addressed if the poverty-reducing effect of growth is to be maximized by lessening, if not resolving, the growth–equity conflict.

### **Redistributive Reforms, Growth, and Poverty**

Traditionally, more egalitarian distribution of income and assets has been seen to have two conflicting effects on poverty. For any given level of average income, a more egalitarian distribution would generally mean less poverty—this is the positive effect. On the other hand, greater equality was believed to be detrimental to the growth of average income for such reasons as reduced savings, reduced incentive for wealth creation, etc. Slower growth, in turn, would mean slower reduction of poverty operating through the growth-poverty nexus—this is the negative effect. The positive effect ensures less poverty today, while the negative effect implies more poverty in future compared to what might have been if distribution had been less egalitarian today. In consequence, pro-poor redistributive policies were seen to entail an intertemporal tradeoff of poverty in favor of the present at the expense of future.

By and large, mainstream economic thinking has tended to frown upon this tradeoff, implicitly making the judgment that the future loss in terms of slower reduction of poverty was too high to justify striving for less poverty today through redistribution of income and assets. As a result, redistributive policies have seldom figured in the standard policy advice given to the developing countries. This is not to suggest that those who offer such advice do not value egalitarian distribution as a means of reducing poverty or even as a goal in itself, but this goal is to be pursued through means other than redistributive policies. The favored means are those that are likely to result in egalitarian growth. This is indeed the rationale for according a pre-eminent place to policies such as outward orientation and investment in human capital in the antipoverty strategy of the World Bank and other policy advisers. These policies are expected to promote growth and egalitarian distribution at the same time—hence their presumed superiority over redistributive policies.

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<sup>26</sup>It is possible, however, that the return to public investment in laggard areas is not fully captured in this study, since the study was conducted in the early stage of the Chinese government's recent drive toward greater rural investment.



This line of thinking no longer seems valid, however, in the light of recent advances in our understanding of the links between distribution and growth.<sup>27</sup> Among the many ideas that have emerged in this literature two are especially relevant in this context. Firstly, for any given rate of growth, the rate of poverty reduction may be faster in economies with higher initial level of equality. Secondly, contrary to conventional wisdom, greater equality may actually be beneficial for growth. If true, the two propositions together suggest that redistributive policies will ensure not only less poverty today but also a faster reduction of poverty in the future, because on one hand average income would grow faster, and on the other the power of growth to reduce poverty will also improve. Redistributive policies need not, therefore, involve any intertemporal tradeoff; they may in fact be regarded as growth strategies *par excellence*.

The first proposition is in the nature of an empirical regularity, first noted by Ravallion (1997). Using high-quality distributional data for 23 developing countries at two points in time, he estimated what he calls the growth-elasticity of poverty—the rate at which poverty declines in response to an increase in the rate of growth—and found this elasticity to vary considerably with the initial distribution of income. For instance, at the lowest Gini index in the sample (0.25) growth elasticity of poverty (as measured by the headcount index) was 3.33, while at the highest Gini index (0.59) it was 1.82. Thus, for any given rate of growth, the power of growth to reduce poverty was nearly doubled as one moved from the least equal to the most equal country in the sample.

The virtue of equality is further strengthened by the second proposition, which states that the rate of growth may itself be higher with higher initial equality. Over the last decade or so, a growing number of theoretical studies have explored the various channels through which greater equality in the distribution of income and assets could lead to a faster rate of growth. Four main channels have been identified, namely endogenous fiscal policy, capital formation under credit constraint, endogenous schooling and fertility decisions, and sociopolitical instability (for extensive reviews of these theories, see in particular Alesina and Perotti 1994, Benabou 1997, and Perotti 1996).

According to the endogenous fiscal policy theories, distribution of income determines government's choice of fiscal policy, which in turn affects the rate of growth. Consider the case where government wants to pursue a redistributive fiscal policy by imposing a tax on capital income and by redistributing the proceeds uniformly across the population. The government wants to choose as high a tax rate as possible in order to maximize the scope for redistribution, but at the same time it wants to ensure that the chosen rate is not considered too high by the majority of the people.

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<sup>27</sup>Kanbur and Lustig (1998) provide an excellent discussion of the reasons behind the revival of interest in distribution issues.

Such a tax rate is found by applying the “median voter theorem”. Note that since redistribution will take place at the expense of the rich, the richer a person is, the lower will be his preferred rate of tax. In general, an individual’s preferred tax rate will vary negatively with his income. Given this pattern of preferences, the tax rate preferred by the person located in the middle of the income distribution—the so-called median voter—will play a crucial role. The government will choose a tax rate that is marginally lower than the one preferred by the median voter, because that is the highest possible rate that will not be considered too high by the majority.<sup>28</sup> The chosen tax rate will be lower for a more equal distribution of income, because for any given level of per capita income, a more equal distribution will imply higher income for the poorer half of the population and thus a lower tax rate preferred by the median voter. The lower tax rate in turn will entail less damage to incentives and hence faster growth.<sup>29</sup>

The second group of theories also links equality with growth through capital accumulation, but unlike the endogenous fiscal policy theories they focus on capital accumulation by the poor faced with a credit constraint. These theories have dealt with both human and physical capital (the strand dealing with human capital has already been mentioned in the third section). The underlying idea is simply that credit constraint prevents poor people from either acquiring physical capital or educating their children as much as they would have liked. A more equal distribution of income will then enable more of them to finance capital acquisition out of their own resources, and hence promote faster accumulation of capital. It is of course true that while enhancing the poor’s command over self-finance, a more equal distribution will also reduce that of the rich, but this will not have any adverse effect on capital accumulation, as the rich have ready access to the credit market. On the whole, then, a more equal society will be able to accumulate more capital and grow faster, other things remaining the same.<sup>30</sup>

The third group of theories draws the link between distribution and growth via people’s decision to have children and to educate them. An equal distribution of income is supposed to affect the schooling and fertility decisions in a manner that would help to promote economic growth. To see how this link works, first note that schooling and fertility decisions are usually intertwined. The decision to give more education to children usually goes with the decision to have fewer of them. This is known in the literature as the “quantity versus quality” tradeoff, where people who want to improve the “quality” of children tend to reduce their quantity.

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<sup>28</sup>The majority in this case will consist of the poorer half of the population plus the person whose income is marginally higher than that of the median voter.

<sup>29</sup>Different versions of this class of models have been developed by Alesina and Rodrik (1994), Bertola (1993), Perotti (1993), and Persson and Tabellini (1994).

<sup>30</sup>The pioneering papers in this tradition are Galor and Zeira (1993) on human capital, and Aghion and Bolton (1997) and Banarjee and Newman (1991, 1993) on physical capital.

The extent of this tradeoff depends on the cost of raising children and the cost of educating them. These costs are often related to the level of household income. For a poor family, the cost of educating children can be quite high, especially in terms of opportunity cost, i.e., income foregone. Young children of poor families are known to contribute significantly to household income, especially in the rural areas of the developing world. If these children are to be sent to school, household income will go down substantially at least in the immediate future. For richer families, however, this opportunity cost is negligible relative to their total income. On the other hand, the cost of raising an extra child is pretty low for a poor family, given the bare minimum of food, clothing, and shelter with which they are accustomed to. For richer families, this cost is not so small. Besides, their opportunity costs of raising children will also be high if working mothers have to give up well-paid jobs, or if they have to employ paid workers to look after the children.

These relationships suggest that as a family climbs up the income scale, the cost of raising children will go up while the cost of educating them will go down. Parents will then be more inclined to limit fertility and to educate their children, i.e., to trade off quantity for quality. It follows, then, that, for a given level of per capita income, a society with a more equal income distribution will have lower fertility and higher education than one with a less equal distribution, because a more equal society will have fewer poor families. Both these consequences—lower fertility and higher education—will in turn help a poor economy to grow faster.<sup>31</sup>

The sociopolitical instability theories essentially formalize the age-old idea that gross inequalities are likely to incite violence, rebellion, or attempts to sabotage the established order on the part of those who feel relatively deprived. The resulting breakdown in the rule of law will create uncertainty in the enforcement of property rights, which in turn will discourage investment and reduce the rate of growth. By implication, a more equal society will enjoy greater certainty of property rights and hence more robust growth.<sup>32</sup>

The proponents of these theories have also generally tried to test them by using the framework of cross-country regression. The standard procedure is to add an inequality variable on the right hand side of a typical Barro-type growth regression (Barro 1991). The initial tests almost invariably came up with a negative sign of the inequality variable, thus lending support to the theories. But these tests were subject to a couple of special problems, in addition to the usual ones associated with cross-country regressions. Firstly, the inequality variable was measured from poor-quality distribution data, with all the problems of noncomparability and nonreliability discussed in the second section. Secondly, since the test was done through a reduced form equation, it was not possible to discriminate between the alternative theories.

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<sup>31</sup>The model of endogenous fertility developed by Becker et al. (1990) implies this particular linkage between distribution and growth, although the paper itself does not address the distribution issues directly.

<sup>32</sup>Examples of this class of models are Alesina and Perotti (1996) and Gupta (1990).

Perotti (1996) has tried to address both these problems. He has used carefully screened distributional data, and tried to discriminate among alternative theories by deriving testable implications that are different (but not mutually exclusive) for different theories. Using a sample comprising both developed and developing countries, he has confirmed the earlier finding that inequality does appear to have a negative effect on growth. He also finds that among the four mechanisms discussed above, there is strong empirical support for the instability mechanism and somewhat weaker support for the endogenous schooling and fertility mechanism, but not much support for the other two.

More significant in the present context, however, is the finding that inequality had no impact on growth in the subsample of poor countries (defined as having per capita income of less than \$1,500 in 1985 PPP dollars). None of the mechanisms linking inequality to growth seemed to operate for these countries. It used to be said that equality is a luxury only the rich countries can afford, because while the quest for equality might retard growth, the rich countries can afford to make the necessary sacrifice. Perotti's findings would now seem to suggest that even if equality promotes rather than retards growth, it is again only the rich countries that can enjoy this happy congruence between equality and growth—they can eat the cake and still see it enlarge—while the poor are left out of the party.

Further reflection shows, however, that such a negative conclusion may not really be warranted. In the first place, as Perotti himself notes, the nonsignificance of the inequality variable in the subsample of poor countries may merely reflect the econometric problem of errors in variable. It is possible that despite all the attempts to screen distributional data for noncomparability and nonreliability, there still remain serious measurement errors in the data of poor countries in comparison with the rich.

The preceding argument implies that the negative effect of inequality on growth could be true as much for the poor countries as for the rich, it is only the measurement error that hides the fact for the poor countries. Even if this is dismissed as a triumph of hope over facts, and the finding is taken at its face value, it still follows that the evidence provides no support for the traditional view that the quest for equality will retard growth. This conclusion establishes at least a weak case for adopting redistributive policies as a component of an antipoverty strategy.

It is arguable, however, that the case for redistributive policies is in fact much stronger, Perotti's finding notwithstanding. There are two fundamental reasons why his finding cannot be taken as decisive evidence for the inability of redistributive reforms to promote growth in poor countries, even if all the issues of data problems are left aside.

The first reason lies in the very nature of the regression equations that form the basis of this finding. All one can infer from these equations is that *incremental* changes in inequality have no effect on growth. That leaves open the question of

what happens when radical reforms are undertaken to bring about large changes in the distribution of income. There are in fact some plausible models in which small reduction in inequality will not promote growth, but large changes will. These models are characterized by a threshold effect. For example, in the models of human capital formation with credit constraint, the poor household may face such a severe constraint that a small increase in income will not be enough to overcome the minimum threshold of fixed costs that are involved in acquiring human capital (examples of this class of models are Perotti 1993 and Aghion and Bolton 1997). A large-scale redistribution will solve this problem.

In fact, when one recalls that the recent theoretical interest in the growth-promoting effect of equality has its origin in the experience of East Asia, one should realize that it is large-scale redistribution that is really relevant. What happened in East Asia were not marginal changes in tax/expenditure policies that can only tinker with the distribution, but radical land reforms that fundamentally altered the distribution of income. There are good reasons to suppose that if greater equality did have a growth-promoting role in East Asia, it was only because distribution was altered so radically.

It is instructive in this context to recall an argument Jeffrey Sachs once made to explain the contrasting growth performance of East Asia and Latin America. He started from the well-trodden ground that East Asia grew more rapidly because it adopted a more export-oriented policy compared to Latin America, but then made the novel point that it was actually the more egalitarian distribution of East Asia that enabled it to adopt more export-oriented policies (Sachs 1987).

The argument went as follows. The adoption of export-oriented policies requires a realistic exchange rate, which typically calls for devaluation in the developing countries. Effective devaluation, however, lowers the real wage rate while raising the relative price of tradables. This means that the owners of land producing tradable agricultural crops will gain and landless workers will lose from devaluation. In Latin America, where land is heavily concentrated among a few landlords, devaluation would therefore imply huge gains for a few at the cost of the majority of rural population. This was not politically feasible; in consequence, effective devaluation and export-oriented growth proved difficult in Latin America. By contrast, radical land reforms in East Asia had ensured that its agriculture was dominated by a large number of nearly equal sized peasant farmers, with hardly any landless laborer. So, almost everybody was to gain from devaluation, and in roughly equal measure. This made devaluation and, therefore, the adoption of export-oriented policies, politically feasible in East Asia.

In the context of the present discussion, the key point of this story is that devaluation was feasible because it made almost all the farmers in East Asia gainers, with hardly a loser in sight. This in turn was only possible because of a radical land

reform that had created a community of equal farmers; marginal tinkering with income distribution would not have done the trick.

The second reason why Perotti's finding cannot be regarded as decisive is that it deals exclusively with the distribution of private income. This focus may be too narrow, especially in the context of human capital formation. For improving the education and health of poor children, public provision of good quality services may be more important than small increments in the private incomes of their parents. The celebrated examples of PRC, Costa Rica, the Indian state of Kerala, and Sri Lanka prove this point (for further elaboration and illustration of this argument, see Dreze and Sen 1989). In poor areas, where private schools and health facilities have not developed because the potential clientele are too poor to make the necessary investment worthwhile, higher private incomes on the part of the poor will fail to buy any extra education or health services. Public provision will be much more effective in this situation. This line of argument suggests that redistributive policies that take the form of greater public provisioning for the poor may well be growth-promoting, even though redistribution of private incomes may not always be.

It follows from the preceding argument that if one wants to test the effect of equality on growth with the help of cross-country regression, then it may not be enough to include only a measure of private income distribution. More revealing would be the inclusion of a variable reflecting the distribution of human capital so as to capture the distribution of both private income and public provisioning. In a recent cross-country regression, Birdsall and Londono (1997) actually included such a variable, educational inequality. Their results show that when both income and educational inequality are included in the growth regression, the former turns out to be insignificant but the latter is robustly significant. This finding indicates that a broader concept of redistribution may well be growth-enhancing.

This study also found that the effect of educational equality on growth of income is nearly twice as strong for the poor as for the population as a whole. This means that redistributive policies that preferentially augment the human capital of the poor will contribute to poverty reduction in two ways: by raising the growth of average income and by tilting the final distribution in favor of the poor. The latter point is consistent with the empirical regularity mentioned earlier that higher initial equality makes for higher growth elasticity of poverty reduction.

### **Conclusion**

The last two decades have seen a great revival in economists' faith in the power of economic growth. In a sense this is a throwback to the decades immediately following the Second World War, when "growthmanship" reigned supreme, only to lie low in the 1970s. Despite the essential similarity, however, the revived faith in

growth does not represent a straightforward imitation of the immediate post-war views. There is at least one fundamental difference. The post-war growthmanship did not much concern itself with the question of whether some particular patterns of growth were especially beneficial for the poor. Maximizing the rate of growth was the primary concern. By contrast, the new view recognizes that not just the rate but the pattern of growth is also fundamentally important.

Although the emphasis on the pattern of growth is the distinguishing feature of the new view, there is a danger that the revived enthusiasm for growth might slip into a kind of growth fundamentalism in which maximizing the rate of growth is again seen to be the best way of reducing poverty.<sup>33</sup>

This is certainly the general tone of a spate of empirical studies that have recently been carried out for assessing the impact of growth on poverty (see the second section). Most of these studies arrive at the conclusion that with rare exceptions, growth helps the poor. While this conclusion has its usefulness, especially as a counter to the antigrowth sentiment that might still linger in some quarters, there is a danger of reading too much into it. The implication typically drawn from these findings is that faster growth will reduce poverty faster, which is just another way of saying that maximizing the rate of growth is equivalent to maximizing the reduction of poverty. In other words, there is apparently no tradeoff between growth and poverty reduction.

The propensity to ignore the possibility of such a tradeoff is one of the more worrying aspects of the current enthusiasm for growth. A good example of this propensity can be found in a recent influential World Bank document on the strategy for poverty reduction in sub-Saharan Africa (World Bank 1997). The main thrust of this report is to reassure policymakers that there exists a set of “win-win” policies that can accelerate growth and at the same time reduce poverty rapidly in sub-Saharan Africa, so that neither needs be sacrificed for the sake of the other.

Even a quick reading of the document makes it clear, however, that this message is but a triumph of hope over logic. For example, one component of the so-called “win-win” strategy is said to be “pro-poor public expenditure patterns” (World Bank 1997, 11). But it is not explained why such expenditure patterns won’t be inimical to growth, at least in the short to medium term, especially if the existing stock of skill and knowledge is concentrated disproportionately among the rich. Another example is “sectoral policies that encourage employment of the poor”; but what is the guarantee that technologies that encouraged employment a bit less and boosted productivity more would not lead to faster growth? Questions like these are not even addressed. This reluctance to face up to the possibilities of tradeoffs can be ultimately damaging, by justifying the single-minded focus on the rate of growth and detracting from the need for paying attention to the pattern of growth.

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<sup>33</sup> A cautionary note against this tendency was earlier voiced by Lipton (1997) and Kanbur (1998).

A related problem is that even when attention is paid to the pattern of growth, there is a propensity to single out a particular pattern of growth that has come to be associated with the notions of outward orientation and trade liberalization. It stands to reason that if a labor-abundant poor country adopts an outward-oriented growth strategy, the poorer people will gain because the considerations of comparative advantage will dictate that the country specializes in labor-intensive activities. It is, therefore, reasonable to suggest that the move toward outward orientation should constitute an important element of a country's poverty-reducing growth strategy. The problem, however, lies in trying to accord this idea the most privileged status in the concept of poverty-reducing growth, to the exclusion of all else, as several recent studies have attempted to do. A number of recent studies show that a liberal trade policy is likely to have a significant effect on poverty, only when combined with other instruments of policy, including redistribution of assets.

The present paper has been motivated by an explicit recognition of these shortcomings of the currently predominant view. Firstly, it has argued that despite the observed positive relationship between growth and poverty reduction, it does not necessarily follow that faster growth will reduce poverty faster. Secondly, it has argued that there is a case for laying much greater emphasis on agricultural growth and redistributive reforms than is currently done when we come to think about pro-poor growth strategies.

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# Poverty Reduction and Economic Growth: The Asian Experience

Peter Warr

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**Abstract.** *The Asian experience of poverty reduction has varied widely. Over recent decades the economies of East and Southeast Asia have achieved large reductions in absolute poverty incidence, but in South Asia the achievement has generally been less impressive. This paper examines the relationship between these outcomes and the rate of economic growth, both in aggregate and in the agricultural, industrial, and services sectors. It uses available data on the headcount measure of poverty incidence in India; Indonesia; Malaysia; Philippines; Thailand; and Taipei, China over the period from the 1960s to the 1990s, in aggregate and in both rural and urban areas. It then uses this data set to analyze the economic determinants of changes in poverty incidence and attempts to explain the differences in the country outcomes that are obtained. The evidence supports the view that the overall rate of economic growth is much more important than its sectoral composition.*

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## Introduction

If policies are to be designed to reduce absolute poverty most effectively, much remains to be understood about the causes of poverty and the conditions that lead to its reduction. For example, it is now well established that the rate of economic growth is a significant determinant of the rate at which poverty declines over time. However, it seems likely that the effectiveness of overall growth as an engine of poverty reduction varies from one country to another, and may also vary from time to time (World Bank 1996, 200). We wish to know not only whether economic growth is associated with poverty reduction, but also the degree to which the nature of the economic growth also matters. Assuming it does, we then wish to know which kinds of growth are most conducive to reducing poverty.

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The present paper looks at three regions of Asia with these issues in mind. It studies the relationship between changes in the headcount measure of absolute poverty incidence and the rate of economic growth in South Asia (India); East Asia (Taipei,China); and four countries of Southeast Asia (Indonesia, Malaysia, Philippines, Thailand). The data cover the period from the 1960s to the 1990s. The above six economies were chosen for their wide geographical coverage and for the availability of data on aggregate poverty incidence covering a significant number of years in each case.

Average rates of poverty reduction differed substantially in these three regions. In India the incidence of absolute poverty declined from 60 percent of the total population in 1957 to 41 percent in 1992 (Table 1), an average annual rate of reduction of 0.7 percent. The comparable rate of reduction for Taipei,China was 1.6 percent per year, and for Southeast Asia the average rate was 1.4 percent (Indonesia 1.4, Malaysia 1.6, Philippines 0.9 percent, and Thailand 1.9). The growth of real gross domestic product (GDP) per person followed a pattern roughly similar to these data on poverty incidence (World Bank 1993). The growth rates of real GDP per person, covering the same periods as the poverty data above were: India 1.9; Taipei,China 6.9; and Southeast Asia 3.5 percent (Indonesia 4.2, Malaysia 4.3, Philippines 1.1 percent, Thailand 4.2). Nevertheless, crude correlations between average GDP growth rates and average rates of poverty reduction, extending over long periods of time, do not necessarily indicate that the differences in GDP growth rates *caused* the differences in rates of poverty reduction.

The limited availability of data that may support statistical analysis has been an impediment to the systematic study of poverty incidence. Some recent studies have attempted to explore the relationships involved by analyzing cross-sectional data sets involving average rates of poverty reduction and growth across many countries, or across regions or households for individual countries, while others have attempted to assemble long-term time series data sets on poverty incidence for individual countries. This paper begins with the time series approach, and then pools data for different economies to increase the number of observations available for analysis. The exercise amounts to testing whether year-to-year fluctuations in GDP growth rates are associated with similar year-to-year fluctuations in rates of reduction in poverty incidence. The second section reviews the data to be studied and the third section summarizes the analytical approach to be used. The fourth section describes the results and the fifth section concludes.



**Poverty and Growth: India; Taipei,China; and Southeast Asia**

Figures 1 to 6 and Table 1 present the data on aggregate poverty incidence and its rural and urban components in the six Asian economies. Significant poverty reduction has been achieved in all six economies but the rate of reduction in Taipei,China and in each of the four countries of Southeast Asia was larger than that in India.

First, we discuss the decomposition of the data on poverty incidence themselves. Table 1 shows the results of this decomposition. All results shown in this table are evaluated at the mean values of the data set. For example, the mean annual change in the aggregate level of poverty incidence for Thailand was -1.9 percentage points per year (i.e., an annual reduction, on average, from numbers like 20 percent to numbers like 18.1 percent). Equation (2) above is an identity and must apply at all points in the data set. It must therefore apply at the means of the data. The equation shows that this mean aggregate change in poverty incidence can be decomposed into three components: average poverty reduction in urban areas, average poverty reduction in rural areas, and average movement of population between these two areas.

Figure 1: Poverty Incidence: India, 1957 to 1997

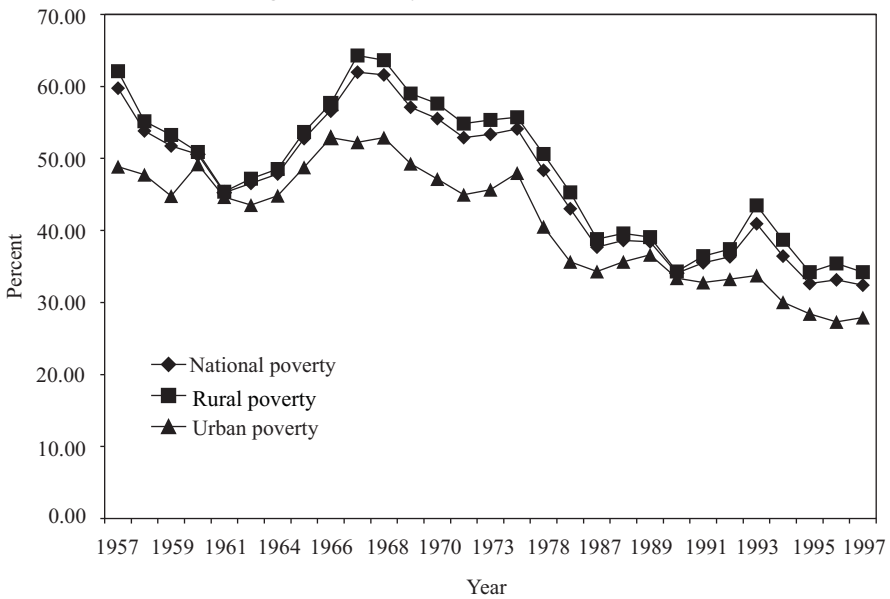


Figure 2: Poverty Incidence: Taipei, China, 1964 to 1995

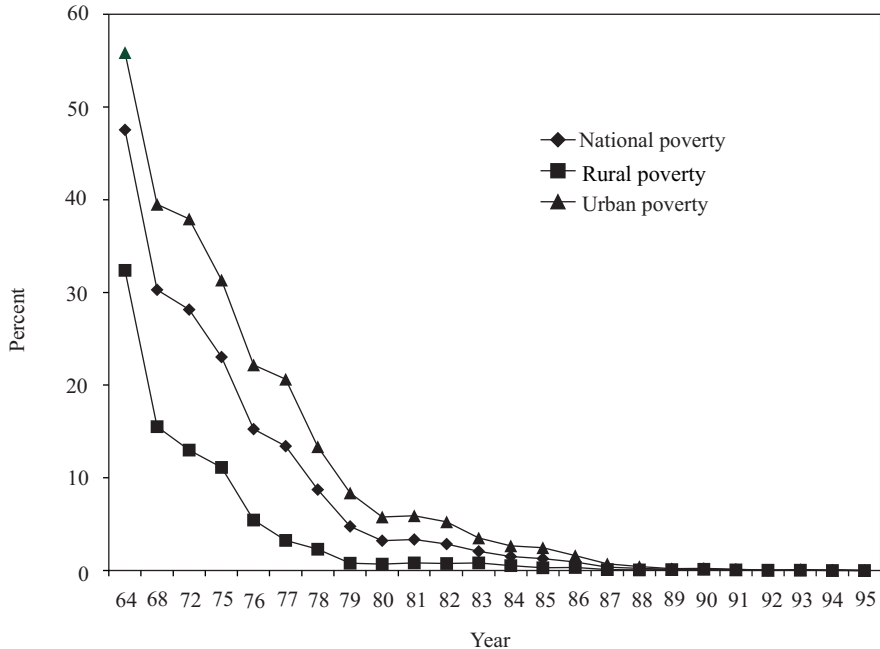


Figure 3: Poverty Incidence: Thailand, 1969 to 1999

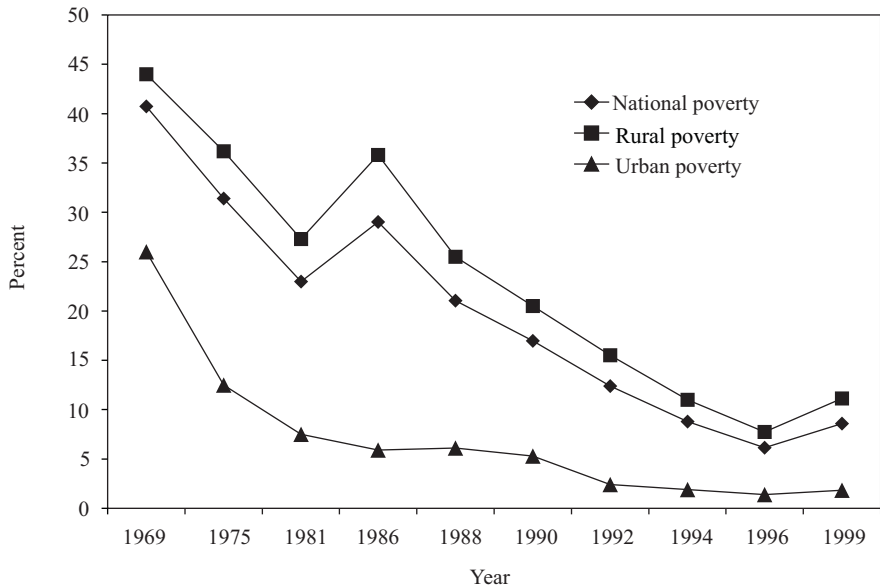


Figure 4: Poverty Incidence: Indonesia, 1976 to 1999

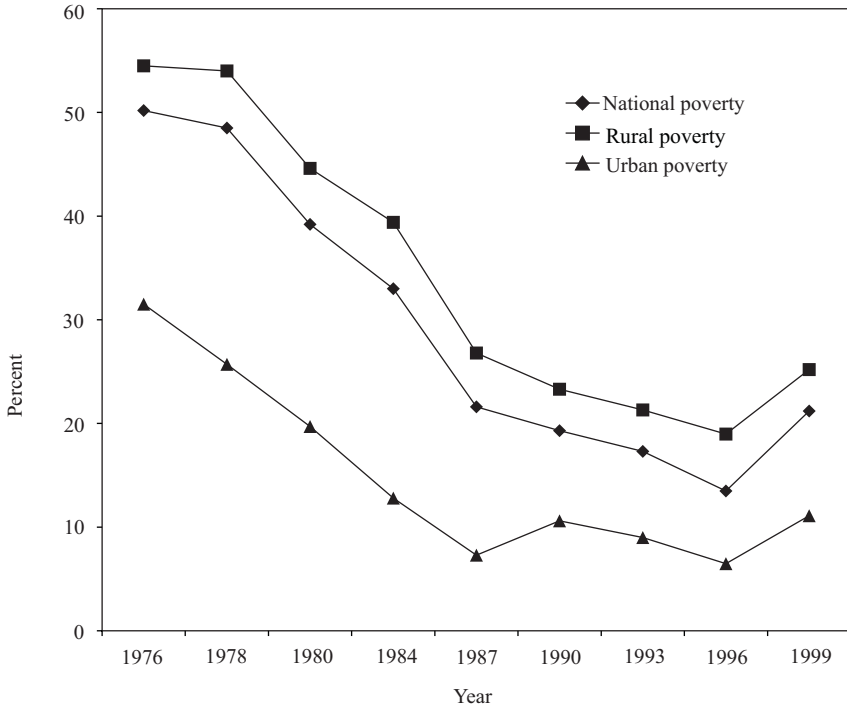


Figure 5: Poverty Incidence: Malaysia, 1976 to 1995

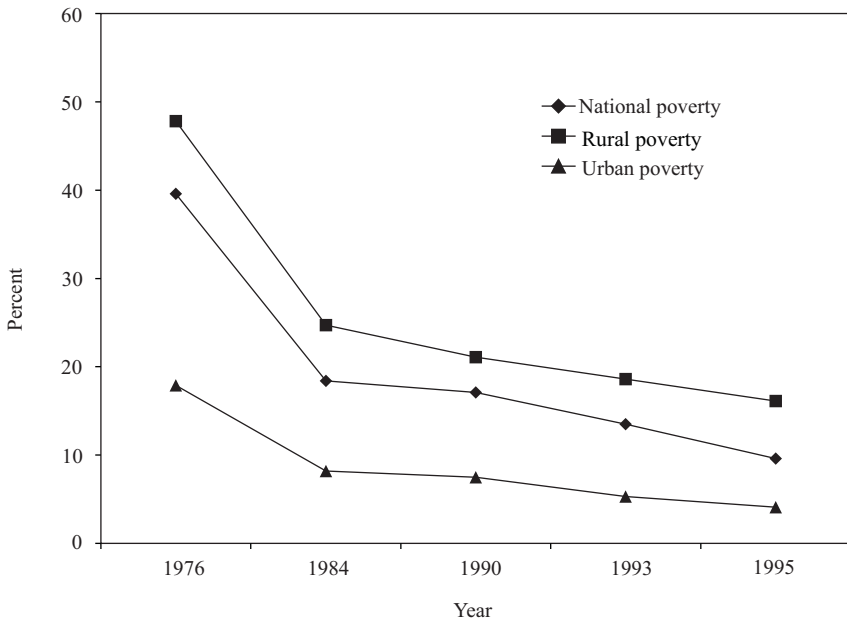


Figure 6: Poverty Incidence: Philippines, 1976 to 1999

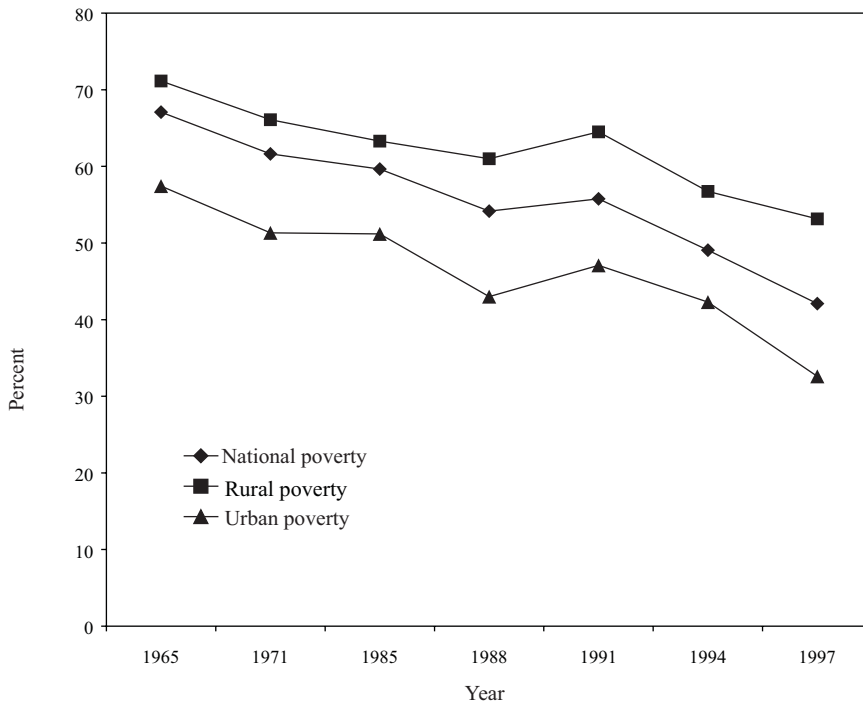


Table 1: Data Decomposition: Annual Rate of Change of Poverty Incidence<sup>a</sup>

	India (1957-1992)	Taipei,China (1964-1995)	Thailand (1969-1999)	Indonesia (1976-1999)	Malaysia (1976-1995)	Philippines (1965-1997)
	Actual					
Aggregate <sup>b</sup>	-0.7	-1.6	-1.9	-1.4	-1.6	-0.9
Rural <sup>c</sup>	-0.3	-1.1	-1.0	-0.6	-1.1	-0.5
Urban <sup>d</sup>	-0.4	-0.4	-0.2	-0.3	-0.3	-0.4
Migration <sup>e</sup>	-0.0	-0.0	-0.6	-0.6	-0.2	-0.1
	Normalized (aggregate=100)					
Aggregate <sup>b</sup>	100.0	100	100	100	100	100
Rural <sup>c</sup>	48.1	71.2	56.0	41.2	68.8	51.4
Urban <sup>d</sup>	46.9	28.9	10.0	18.5	18.8	39.2
Migration <sup>e</sup>	5.0	-0.1	33.9	40.3	12.4	9.4

Notes:

<sup>a</sup> The decomposition relates to the terms of equation (2). Aggregate = urban + rural + migration.

<sup>b</sup> Mean annual value of  $dP$ , the year-on-year change in aggregate poverty incidence.

<sup>c</sup> Mean annual value of  $\alpha^R dP^R$ , the year-on-year population share-weighted change in rural poverty incidence.

<sup>d</sup> Mean annual value of  $\alpha^U dP^U$ , the year-on-year population share-weighted change in urban poverty incidence.

<sup>e</sup> Mean annual value of  $(P^R - P^U) d\alpha^R$ , the year-on-year migration-induced change in poverty incidence

The second half of Table 1 normalizes the decomposition by dividing all values by this mean change in aggregate poverty (-1.9 for Thailand, for example) and multiplying by 100. For Thailand, reductions in rural poverty accounted for 56 percent of the overall reduction in poverty; in urban poverty, 10 percent; and in migration, 34 percent. Migration effects were even more important for Indonesia, but for all six economies reductions in rural poverty account for more than 40 percent of the total reduction in poverty incidence.

The above calculations are, of course, merely descriptions of the data. We wish to know what caused these observed changes in poverty incidence to occur and, in particular, what caused the differences across countries. Poverty incidence and its changes over time obviously depend on many factors—of which economic variables are only part of the story—and among the economic variables many issues aside from simply the overall rate of growth will be relevant. Changes in commodity prices will play a role, along with tax policies. The sectoral composition of growth and the degree to which it is directed toward export markets or domestic markets may also be important. Nevertheless, the data suggest superficially that the overall rate of growth may be an important part of the story. The data on real GDP growth per person are summarized in Table 2, covering the same time periods as the poverty data reviewed above.

**Table 2: Annual Average Rates of Growth of Real GDP Per Person and its Components**

	<b>India (1957-1992)</b>	<b>Taipei,China (1964-1995)</b>	<b>Thailand (1969-1999)</b>	<b>Indonesia (1976-1999)</b>	<b>Malaysia (1976-1995)</b>	<b>Philippines (1965-1997)</b>
Total	1.9	6.9	4.2	4.2	4.3	1.1
Agriculture	0.4	0.1	2.0	1.8	1.3	0.3
Industry	4.4	7.6	8.0	6.6	6.4	1.9
Services	4.3	7.5	5.3	5.2	5.0	1.6

India’s rate of GDP growth was the lowest, as was its rate of poverty reduction. Taipei,China’s rate of economic growth was the highest and its rate of poverty reduction was the third highest, after Thailand and Malaysia, and higher than the average for Southeast Asia. Among the Southeast Asian countries, reductions in poverty have been achieved in each of the four countries but the rate of reduction was lowest in the Philippines, where the average rate of growth was also lowest. At the level of individual economies, a relationship between the rate of poverty reduction over time and the rate of growth over time also seems possible. For example, in Thailand poverty incidence fell throughout the period indicated except

for the recession period of the early 1980s when measured poverty incidence increased; and again in the Asian crisis period of the late 1990s when it increased once more. We shall explore this statistical relationship in more detail below.

### Analytical Framework

We shall review first the relationship between aggregate, rural, and urban poverty incidence and then turn to the manner in which each of these measures is affected by economic growth. Changes in aggregate poverty incidence may be decomposed into rural and urban components, as follows. We shall write  $N$ ,  $N^R$  and  $N^U$  for the total, rural, and urban populations, respectively, where  $N = N^R + N^U$ . We write  $\alpha^R = N^R / N$  and  $\alpha^U = N^U / N$  for the rural and urban shares of the total population, respectively, where  $\alpha^R + \alpha^U = 1$ . The total number of people in poverty is given by  $N_p = N_p^R + N_p^U$ , where  $N_p^R$  and  $N_p^U$  denote the number in poverty in rural and urban areas, respectively. Aggregate poverty incidence is given by

$$P = N_p / N = (N_p^R + N_p^U) / N = \alpha^R P^R + \alpha^U P^U, \quad (1)$$

where  $P^R = N_p^R / N^R$  denotes the proportion of the rural population that is in poverty and  $P^U = N_p^U / N^U$  the corresponding incidence of poverty in urban areas.

Now, differentiating (1) totally, we obtain a key relationship,

$$dP = \alpha^R dP^R + \alpha^U dP^U + (P^R - P^U) d\alpha^R. \quad (2)$$

From (2), the change in poverty incidence may be decomposed into three parts: (i) the change in rural poverty incidence, weighted by the rural population share; (ii) the change in urban poverty incidence weighted by the urban population share; and (iii) the movement of populations from rural to urban areas weighted by the difference in poverty incidence between these two areas. This equation is the basis for the decomposition of changes in poverty incidence shown in Table 1.

The last of these terms is described by Anand and Kanbur (1985) and by Ravallion and Datt (1996) as the ‘‘Kuznets effect’’ building on Lewis (1954). As the population moves from rural to urban areas, a change in aggregate poverty incidence will occur even at constant levels of rural and urban poverty incidence, provided that the levels of poverty incidence in these two sectors is different. In growing economies, we expect to find that the rural population share is falling ( $d\alpha^R < 0$ ) and that the incidence of poverty in rural areas typically exceeds that in urban areas ( $(P^R - P^U) > 0$ ). Thus, the expected sign of  $(P^R - P^U) d\alpha^R$  is negative. How important the Kuznets effect is as a determinant of overall poverty reduction is, of course, an empirical matter.

We now turn to the manner in which poverty incidence is affected by economic growth and, for simplicity, we hypothesize initially that the total number of households in poverty,  $N_p$ , depends on the aggregate level of real income,  $Y$ , and the size of the population,  $N$ . Thus

$$N_p = \varphi(Y, N). \tag{3}$$

The incidence of poverty is defined as

$$P = N_p / N = \varphi(Y, N) / N. \tag{4}$$

Totally differentiating this equation,

$$dP = (\varphi_Y Y / N)y + (\varphi_N - \varphi / N)n, \tag{5}$$

where lower case Roman letters represent the proportional changes of variables represented in levels by upper case Roman letters. Thus  $y = dY / Y$  and  $n = dN / N$  are the growth rates of aggregate real income and of population, respectively. In the special case where the function  $\varphi(\cdot)$  is homogeneous of degree one in  $Y$  and  $N$ , (3) may be written  $N_p = \varphi_Y Y + \varphi_N N$  and (5) reduces to

$$dP = (\varphi_Y Y / N)(y - n). \tag{6}$$

In this case the change in poverty incidence depends on the growth of per capita income. We shall impose this assumption and will therefore be estimating expressions of the form

$$dP = a^1 + b^1(y - n). \tag{7}$$

The constant term  $a^1$  captures the impact of factors other than growth, which also influence changes in poverty incidence. We wish to test whether the coefficient  $b^1$  is significantly greater than zero and whether there are systematic differences between countries or regions in this coefficient.

We wish to study the way economic growth affects each of the components of the change in aggregate poverty incidence, as given by (2). Ravallion and Datt apply an ingenious method for estimating decomposed equations systems of this kind. We have a four-equation system, consisting of (7) and:

$$\alpha^R dP^R = a^2 + b^2(y - n) \tag{8}$$

$$\alpha^U dP^U = a^3 + b^3(y - n) \tag{9}$$

$$(P^R - P^U)d\alpha^R = a^4 + b^4(y - n). \tag{10}$$

But from the identity given by (2), these equations are linearly dependent. Equation (7) is identically the sum of equations (8), (9), and (10). Of these four equations, only three need to be estimated. The parameters of the fourth can be computed from (2). It is therefore possible to estimate equations (7), (8), and (9) and then to infer the parameters of (10) from the identities  $a^4 = a^1 - a^2 - a^3$  and  $b^4 = b^1 - b^2 - b^3$ .

### Statistical Method

Data were assembled for the dependent variables  $dP$ ,  $\alpha^R dP^R$  and  $\alpha^U dP^U$ . For India and Taipei,China the data are approximately annual, but for the countries of Southeast Asia, they are not. Allowance must be made for this fact. Each interval between the data points indicated in Figures 3 to 6 is used to construct the change in the value of the dependent variable for each of the economies concerned, with the calculated value divided by the number of years corresponding to that time interval, giving an annual rate of change for that variable. These annualized rates of change then become the dependent variables used in the regression analysis. There was a single independent variable, rate of growth of GDP per person, and it was constructed on a comparable basis. In the regression analysis, observations were then weighted by the number of years in the interval concerned.

Since the meaning of the poverty lines is different in each of the six economies studied, and since the structure of the economies is also different, we should not expect that the same relationship between poverty incidence and aggregate growth per person would exist in all these economies. Intercept and slope dummy variables were used to determine the relationship most consistent with the data. Initially, intercept and slope dummy variables were used for five of the six economies (all but the Philippines). Slope dummies for each of the four Southeast Asian countries proved to be highly insignificant and were dropped. Thus all four of the Southeast Asian countries have the same slope term. Intercept dummies were also insignificant for these countries, though not to the same extent as the slope dummies, and they were retained for all four countries but one (Philippines). The intercept dummies for the other three Southeast Asian countries are therefore to be interpreted as differences from the Philippines intercept term, which is the constant term for the overall regression. Slope and intercept dummies were retained for India and Taipei,China but only intercept dummies were retained for Southeast Asia. The meaning of the slope dummies for India and Taipei,China is therefore that they are differences from the slope coefficient for Southeast Asia. The estimated slope coefficient for each of those economies (India and Taipei,China) is obtained by adding its slope dummy variable to the overall slope coefficient for the data set (the coefficient for Southeast Asia). We wish to determine whether these slope dummies for India and Taipei,China are significant and if so, their signs.



## Results

### Statistical Results

The regression results are summarized in Table 3. The surprising feature of the results is that while the overall slope coefficient for the combined regression was highly significant (significant at the 1 percent level), slope dummies for individual economies were all insignificant, including both India and Taipei,China. What this indicates is that the relationship between the change in absolute poverty incidence and economic growth per person is significant and approximately the same for all six economies. That is, the results imply that the power of economic growth to reduce poverty did not differ significantly among these six economies. To the extent that the differences in the poverty outcomes can be attributed to economic growth, it is primarily not differences in the *quality* of growth that explains their different performance in terms of absolute poverty reduction, but differences in the *rate* of economic growth per person. Similar results were obtained in this respect for aggregate poverty incidence, rural poverty, and urban poverty.

Table 3: Poverty Incidence and Aggregate Growth:  
Weighted Regression Results

Variable	Percentage Change in Total Poverty		Percentage Change in Rural Poverty		Percentage Change in Urban Poverty	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	-0.5	-1.5	-0.1	-0.5	-0.3	-2.5***
GDP growth per capita	-0.4	-4.8***	-0.3	-5.7***	-0.1	-2.4**
Slope dummy, Taipei,China	0.1	0.6	0.1	1.1	-0.0	-0.3
Slope dummy, India	-0.0	0.3	0.1	0.6	-0.0	-0.8
Intercept dummy, Thailand	0.3	0.6	0.5	1.4	0.4	1.6
Intercept dummy, Indonesia	0.8	1.5	1.0	2.5***	0.3	1.2
Intercept dummy, Malaysia	0.7	1.2	0.5	1.2	0.3	1.1
Intercept dummy, Taipei,China	1.0	0.9	0.4	0.5	0.5	1.2
Intercept dummy, India	0.3	0.6	0.1	0.2	0.1	0.7
R-squared	0.4		0.4		0.1	
Adjusted R-squared	0.4		0.4		0.1	
F-statistic	15.5***		14.1***		3.2***	
No. of observations	174		174		174	

Notes:

\* Significant at 10 percent level

\*\* Significant at 5 percent level

\*\*\* Significant at 1 percent level

It is notable that the response of poverty incidence to growth was approximately the same in all six economies in spite of the fact that the composition of their growth was quite different. Table 2 shows that the sectoral composition of growth differed considerably among the six economies. For example, agriculture's contribution to overall growth was quite high in Indonesia and Thailand and low in India; Philippines; and especially Taipei,China. These results suggest that the sectoral composition of growth may be a secondary issue. The overall *rate* of growth is apparently the overwhelmingly important determinant of the rate of poverty reduction—regardless which sector of the economy actually generates the growth. Further research will nevertheless be required before any generality could be attributed to this result.

### Quality of Growth

That the effect of growth on absolute change in poverty incidence is approximately the same across countries does not imply that the proportional change is the same. The estimated response of absolute poverty incidence to economic growth (incorporating the slope dummy variable estimates shown in Table 3) can be used to estimate the elasticity of poverty incidence with respect to the rate of growth of real GDP per capita. These estimates, evaluated at sample means, are as follows:

#### Growth Elasticity of Aggregate Poverty

India	-0.9
Taipei,China	-3.8
Thailand	-2.0
Indonesia	-1.4
Malaysia	-2.1
Philippines	-0.7

These elasticities should be understood as the proportional change in absolute poverty incidence relative to the proportional change (growth rate) of real GDP per person. The result that the change in poverty incidence per unit of economic growth is similar across countries implies that the elasticity of poverty with respect to growth is highest in economies where average levels of poverty incidence is lowest and lowest where average levels of poverty incidence is highest.

It is notable that the more open economies—Taipei,China, followed by Malaysia and Thailand—exhibit the highest growth elasticities. The least open economies—India and the Philippines—exhibit the lowest growth elasticities. The issue raised by these results is whether the “quality of growth”, interpreted here as its capacity to reduce poverty incidence, is causally related to trade policy in particular and to development strategy in general. The evidence produced by the small sample

of countries considered here is consistent with the hypothesis that a more open trade policy leads to a pattern of development that entails (i) a higher rate of growth and (ii) a pattern of growth that is more poverty-reducing. The sample is too small to support strong conclusions in that regard, however, and much more evidence would be required before a relationship of this kind could be asserted. There are nevertheless analytical reasons to suggest that a relationship of this kind may exist.

Consider the pattern of industrialization that has occurred in Taipei, China, on one hand, and in India on the other. Taipei, China's pattern was not supported by protection of manufacturing but by exploitation of Taipei, China's comparative advantage. This produced a labor-intensive pattern of industrial growth, involving a high proportion of small-scale and medium-scale enterprises and included extensive rural-based industrial development. India's pattern was based on high levels of industrial protection. This led to industrial development that was capital-intensive, involving predominantly large-scale enterprises that were urban-based and isolated from rural areas. It would hardly be surprising if Taipei, China's export-oriented strategy was not merely more growth-promoting, but also led to a pattern of growth that reduced poverty incidence more effectively *per unit of growth* than India's import substitution-based strategy. Of course, the issue is ultimately empirical. It remains to be seen whether systematic exploration of the evidence on this point supports these theoretical conjectures.

The analytical issue that seems central is the demand for unskilled and semi-skilled labor. Unskilled and semi-skilled labor are the principal resources owned by poor people. This line of reasoning suggests that patterns of development that increase the demand for unskilled labor—involving more labor-intensive modes of production and high rates of productivity advance—will produce more rapid poverty reduction.

### **Determinants of Poverty Reduction**

The results confirm that the rate of growth of real GDP per person has a significant influence on the rate of poverty reduction. Naturally, it is not the only determinant. The R-squared statistics indicate that only around 40 percent of the annual variation in the rate of poverty reduction is explained by variation in the rate of growth. Moreover, the presence of a constant term means that on average some change in poverty incidence occurs regardless of the rate of growth. That is, the effect that all the nongrowth factors have on poverty incidence does not have a mean of zero. The importance of the constant term is further explored in Tables 4 to 9. These tables decompose the changes in poverty incidence at the means of the data set. We know that at the mean of the data, the value of the error term is zero. But the constant term is nonzero. The mean change in poverty incidence can be decomposed into two parts: the estimated effect of growth and the estimated net effect of all other

influences. What Tables 4 to 9 show is that for all six economies the growth effect (the slope component) outweighs the net effect of all other variables (the constant term component).

Table 4: **Decomposition of Changes in Poverty Incidence, India**

		Estimated (% points change per year)	
		Constant	Aggregate Growth per Capita
Aggregate	-0.7	-0.2	-0.5
Rural	-0.3	-0.0	-0.3
Urban	-0.3	-0.1	-0.2
Migration	-0.0	0.0	-0.1
		Normalized (aggregate=100)	
Aggregate	100	25	75
Rural	48	7	41
Urban	47	22	25
Migration	5	-5	10

Table 5: **Decomposition of Changes in Poverty Incidence, Taipei,China**

		Estimated (% points change per year)	
		Constant	Aggregate Growth per Capita
Aggregate	-1.6	0.5	-2.1
Rural	-1.1	0.3	-1.4
Urban	-0.4	0.2	-0.6
Migration	0.0	0.0	0
		Normalized (aggregate=100)	
Aggregate	100	-30	130
Rural	71	-19	90
Urban	29	-11	40
Migration	-0.1	-0.1	0.0

Table 6: **Decomposition of Changes in Poverty Incidence, Thailand**

		Estimated (% points change per year)	
		Constant	Aggregate Growth per Capita
Aggregate	-1.9	-0.2	-1.7
Rural	-1.0	0.4	-1.4
Urban	-0.2	0.1	-0.3
Migration	-0.6	-0.7	0.0
		Normalized (aggregate=100)	
Aggregate	100	9	91
Rural	56	-21	77
Urban	10	-6	16
Migration	34	36	-2

Table 7: **Decomposition of Changes in Poverty Incidence, Indonesia**

		Estimated (% points change per year)	
		Constant	Aggregate Growth per Capita
Aggregate	-1.4	0.3	-1.7
Rural	-0.6	0.9	-1.4
Urban	-0.3	0.0	-0.3
Migration	-0.6	-0.6	0.0
		Normalized (aggregate=100)	
Aggregate	100	-22	122
Rural	41	-61	102
Urban	19	-3	22
Migration	40	43	-2

Table 8: **Decomposition of Changes in Poverty Incidence, Malaysia**

		Estimated (% points change per year)	
		Constant	Aggregate Growth per Capita
Aggregate	-1.6	0.2	-1.8
Rural	-1.1	0.4	-1.5
Urban	-0.3	0.0	-0.3
Migration	-0.2	-0.2	0.0
		Normalized (aggregate=100)	
Aggregate	100	-10	110
Rural	69	-24	93
Urban	19	-1	20
Migration	12	14	-2

Table 9: **Decomposition of Changes in Poverty Incidence, Philippines**

		Estimated (% points change per year)	
		Constant	Aggregate Growth per Capita
Aggregate	-0.9	-0.4	-0.5
Rural	-0.5	-0.1	-0.4
Urban	-0.4	-0.3	-0.1
Migration	-0.1	-0.0	-0.1
		Normalized (aggregate=100)	
Aggregate	100	43	57
Rural	51	12	40
Urban	39	31	8
Migration	9	1	9

## Conclusion

This paper has analyzed the statistical evidence on the relationship between poverty incidence and economic growth in six economies: India; Indonesia; Malaysia; Philippines; Taipei, China; and Thailand. The economies were chosen because they each provide estimates of aggregate poverty incidence over a large number of years. Data on these six economies were pooled to determine whether the relationship between the rate of growth and the rate at which absolute poverty incidence declined was different among the six. The somewhat surprising result was

that the effect that a unit of growth of real GDP per person has on the decline of total poverty incidence was very similar across the six economies. The surprise arises from the fact that the sectoral composition of growth was very different for the six economies. For example, the contribution of agriculture to overall growth differed widely.

The above results suggest that the sectoral composition of growth may be a less important issue in determining its poverty-reducing capacity than was previously thought. Further research would be needed before any generality could be attributed to results of this kind. But if these results are confirmed, their implications could be considerable. They would imply that policies intended to influence the sectoral composition of growth—on the grounds that, say, growth of agriculture is more poverty-reducing than growth in other sectors—could actually *reduce* the rate at which poverty declines if these policies have the effect of reducing the rate of overall growth.

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