

Pro-poor Growth

Peter Warr*

Poverty is not natural. It is man-made.
And it can be eradicated by human action.

Nelson Mandela, July 2005¹

[There] are two paradigms for Human Development:
one that believes in the overwhelming power of economic growth,
another that emphasises the design of pro-poor policies.

Jan Vandemoortele (2005)

Pro-poor growth is often advocated but seldom defined. Some proposed definitions and associated measures are reviewed in this paper. Much of this literature stresses the importance of reducing economic inequality. A basic source of confusion is whether inequality reduction is desired as a means for reducing poverty or as an end in itself. This paper argues that if it is the former, as is usually said, the pro-poor growth literature tends to overstate the importance of reducing inequality, or avoiding an increase. Growth that is most effective at reducing poverty does not necessarily coincide with growth that reduces inequality. This literature is overly pre-occupied with statistical evaluation of the outcomes of economic events, based on changes in the distribution of household incomes or expenditures. What is most needed is solidly based empirical research on the manner and extent to which alternative growth strategies influence the rate of poverty reduction.

Whether or not the scourge of absolute poverty can ever be eradicated, there is no doubt that—as former President Mandela reminds us so powerfully—human action can greatly reduce it. The question is, which courses of action are most effective in doing so? For decades, the dominant view, among economists at least, has been that for poor countries the attainment of significant economic growth is the key to poverty reduction. The reason is

elementary: in the poorest countries, where absolute poverty is most concentrated, even if current incomes could be redistributed radically without reducing total national income, most people would still be poor. There is simply not enough income in these countries to go around. Even the very large volumes of foreign aid currently being proposed will not reduce poverty greatly unless they contribute to raising the incomes of poor people on a sustained basis.

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¹ Televised speech by Nelson Mandela on the occasion of the worldwide *Live-8* concerts in July 2005.

Many studies have examined the relationship between the rate at which absolute poverty incidence declines and the rate of growth of real GDP. Unsurprisingly, these studies confirm a strong statistical correlation between these two variables (World Bank 2000). Dollar and Kraay (2002) report empirical results from a large cross-country data set indicating that 'on average' the incomes of the poorest one fifth of the population rise at roughly the same rate as mean incomes. That is, within this historical data set, the average outcome is that inequality does not change systematically with the rate of growth. Some observers have taken these results to mean that maximising the rate of poverty reduction is best achieved by maximising the rate of growth of output, ignoring distributional issues, though this is not what Dollar and Kraay say.² There is significant variation of individual country experience around the average result that they report. Growth may have greater or smaller effects on poverty reduction, depending on initial conditions, the nature of the growth process, and the policy environment in which the growth takes place.

It seems inescapable that for almost any poor country, policies directed at promoting economic growth must be at the core of a long-term poverty reduction strategy. But it is also clear that different forms of growth will not reduce poverty equally. Which forms of growth reduce poverty the most, and how can they be fostered? Further, how useful for poverty reduction are policies that are purely redistributive, which have no effect on growth and which possibly even reduce it? Recognising the importance of these issues, many institutions have recast their objectives in terms of the achievement of poverty reduction. Examples include international development institutions such as the World Bank, the Asian Development Bank, and the United Nations Development Programme, along with many specialised development agencies, most bilateral development assistance agencies, and numerous

non-governmental organisations. Many have also espoused pro-poor growth as a means of achieving the goal of poverty reduction.

It is surprising how frequently pro-poor growth is recommended without being defined. For example, the former President of the Asian Development Bank (ADB), Tadao Chino, has declared that: 'poverty is the deprivation of essential assets and opportunities to which every human being is entitled' and that 'poverty reduction is now the overarching goal of ADB' (Chino 2002:45). Pro-poor growth is cited as one of the three pillars of the Bank's *Poverty Reduction Strategy*. It is noted that:

Growth is pro-poor when it is labor absorbing, and accompanied by policies and programs that mitigate inequalities and facilitate income and employment generation for the poor, particularly women and other traditionally excluded groups. (ADB 1999:6)³

This statement describes some characteristics that pro-poor growth might reasonably possess, but it is not a definition, and a definition is needed. What is the distinction between growth that is pro-poor and growth that is not? How could policy be effectively directed towards achieving an undefined target?

If a widely accepted definition of pro-poor growth existed, there would of course be no need for its advocates to keep repeating it. But this is not the case. A rapidly growing and vigorous academic literature has debated the concept, offering rival definitions and measures. To a lesser extent, this literature has also discussed policy strategies conducive to achieving the forms of growth that seem most 'pro-poor' according to these competing definitions. The protagonists are not simply attempting to classify past periods of growth according to whether they fit into this or that arbitrarily defined category. They intend that their particular definitions be adopted as goals of policy. If 'pro-poor growth' is to be taken seriously, the differences in definition are of more than academic interest.

2 Dollar and Kraay state that their result 'does not mean that the potential distributional effects of growth, or the policies that support growth, can or should be ignored' (p.27).

3 Both the ADB's later Review of its *Poverty Reduction Strategy* and the subsequent *Enhanced Poverty Reduction Strategy* (ADB 2004) similarly stress the importance of pro-poor growth, but neither defines it.

This paper attempts to clarify the main concepts of 'pro-poor growth' being proposed and to explore their implications. Some technical discussion cannot be avoided, but the objective is to evaluate the practical usefulness of the concept of 'pro-poor growth' from the perspective of policymakers. The paper illustrates the concepts discussed using data for Thailand.

Two preliminary points must be clarified first. The most important is the meaning of poverty. In particular, does it mean absolute poverty or relative poverty?

- Absolute poverty involves a comparison of the incomes (or expenditures) of households with some pre-determined standard. It is measured by indicators such as the well-known headcount index and related measures.⁴ These measures tend to be highly correlated.
- Relative poverty, subsequently referred to as inequality to avoid confusion with absolute poverty, involves a comparison of the incomes (or expenditures) of poor households with those of the rich. It is measured by indicators such as the Gini coefficient,⁵ among others.

The pro-poor growth literature assumes that the objective of policy is to maximise the rate at which *absolute poverty* is reduced. While this single goal may not correspond to the outcomes sought by any government or international institution, it is taken for granted in this literature that poverty reduction is the objective. The central analytical issue that arises within this literature is the extent to which reducing inequality, or avoiding an increase in it, is important for achieving the assumed goal of poverty reduction. A vital question is thus how the reduction of absolute poverty is, on the one hand, related to economic growth, and

on the other, to policies intended to redistribute assets and incomes.

A second, though less critical, issue is the meaning of growth. Most economists, along with most policymakers, understand economic growth to be the rate of change of real economic output, as captured by national accounts measures such as real Gross Domestic Product (GDP) per person. The price deflator, used to convert nominal values into constant price (real) values, is thus the GDP deflator. But the 'pro-poor growth' literature is generally cast in terms of the rate of change of the variables used to measure poverty and inequality, as derived from household income and expenditure surveys. In many countries this means the real value of household expenditures per person or per adult equivalent, while in others it means the real value of household incomes, again per person or per adult equivalent.⁶ In this case, the deflator is the consumer price index or a variant of it.

When the pro-poor growth literature talks about economic growth, what is actually meant is the rate of change of the mean of real household expenditures per capita or real household incomes per capita, as measured by these household income and expenditure surveys. The closeness or otherwise of the relationship between the macroeconomic national accounts data used to estimate real GDP per capita and the microeconomic household survey data used to estimate real household expenditures or incomes per capita is typically ignored.

The next section of this paper presents a simple analytical framework that helps in visualising the issues involved in the pro-poor growth debate. Two prominent attempts to provide a definition are then reviewed critically and illustrated using data for Thailand. These are due to Kakwani and Pernia (2000)

4 The headcount index measures the proportion of the population whose incomes fall below a given threshold, the poverty line, whose real purchasing power is held constant over time and across regions. The headcount index has some undesirable features but it remains the most widely used indicator of poverty. It belongs to the well-known Foster-Greer-Thorbecke (FGT) class of measures, which also includes the poverty gap index and the severity of poverty index. Foster, Greer and Thorbecke (1984) famously showed that this class of poverty measures has a unique set of convenient properties.

5 The Gini coefficient varies from 0 to 1, with higher values indicating greater inequality.

6 Official poverty estimates for Thailand, Malaysia and the Philippines use household incomes for this purpose, while in Indonesia, Cambodia, Laos and Vietnam household expenditures are used. China uses both.

and Ravallion and Chen (2001). It is concluded that the definitions and measures of pro-poor growth that are advanced in these studies are analytically interesting but add little of practical value in the search for policies that contribute to poverty reduction. The final section of the paper offers an alternative measure that can be easily applied.

Analytical framework: growth, inequality and poverty

This section provides a simple analytical framework for understanding the relationship between growth and changes in inequality on the one hand and changes in poverty incidence on the other. It approaches this relationship as a problem of policy choice, with a structure analogous to consumer choice theory. I begin by postulating, for convenience, that poverty incidence depends on the level of mean incomes and the level of inequality. Thus,

$$P = P(\bar{Y}, G), \quad (1)$$

where P is poverty incidence, which for simplicity is taken to be the headcount index; \bar{Y} denotes the mean of all household incomes per person; and G denotes a measure of inequality such as (but not necessarily) the Gini coefficient. Both \bar{Y} and G are defined over all households, not just the poor.

Though it is assumed, for convenience, that equation (1) holds exactly, it must be recognised that it generally holds only as an approximation. It will be an exact description of the level of poverty incidence if the cumulative distribution of incomes can be described by a two-parameter distribution function. Well-known examples are the log-normal distribution and the gamma distribution. For example, the log-normal distribution is a function of the mean and the variance of the distribution and the Gini coefficient is a simple function of the variance, implying that if the actual distribution is log-normal, equation (1) holds exactly.

Empirical work indicates that either the log-normal or the gamma distribution frequently

provide quite good approximations to the cumulative distribution of income data for many countries. But this is an empirical matter. To the extent that they (or some other two parameter distribution) do not describe the data exactly, there will be some error associated with equation (1), because there will not exist a single measure of inequality that captures the shape of the distribution of incomes accurately enough for equation (1) to be exact.

The equation for changes in poverty incidence is derived by differentiating equation (1) and dividing by P , which gives

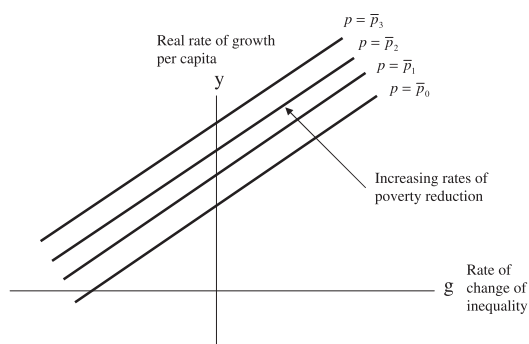
$$p = \eta_{PY}y + \eta_{PG}g, \quad (2)$$

where lower case Roman letters are used to denote proportional rates of change. Thus $p = dP/P$, $y = d\bar{Y}/\bar{Y}$, and $g = dG/G$. In addition, η_{PY} denotes the partial elasticity of the poverty measure, P , with respect to mean household income per person, holding the measure of inequality constant, and η_{PG} denotes the partial elasticity of P with respect to the measure of inequality, G , holding mean income per person constant. From these definitions, it is necessarily the case that $\eta_{PY} < 0$ and (provided the poverty line is below the mean) $\eta_{PG} > 0$.

Equation (2) gives an approximate decomposition of the proportional change in poverty incidence into two components: one due to growth of mean household income, holding inequality constant (the first term on the right hand side), and another due to the change in inequality, holding mean income constant (the second term). Now suppose that the objective of policy is to maximise the reduction of absolute poverty. Equation (2) thus describes the utility function of the policy maker: greater levels of poverty reduction mean higher utility. By setting the left hand side equal to a constant, \bar{p} , an indifference curve is derived that describes the combinations of growth per capita and changes in inequality which produce the same rate of poverty reduction, or the same level of utility. The equation of each such indifference curve is

$$y = \bar{p}/\eta_{PY} - g\eta_{PG}/\eta_{PY}. \quad (3)$$

Figure 1
Effects of growth and changes in inequality on poverty reduction



This is shown in Figure 1, for different rates of poverty reduction (\bar{p}). Since $\eta_{pG}/\eta_{pY} < 0$ the slope of these indifference curves (the marginal rate of substitution between growth and changes in inequality) is positive. In the diagram they are shown as linear, but they need not be. The important point is that they are upward sloping. The arrow shows the direction of increasing preference, corresponding to higher rates of poverty reduction. In the diagram, \bar{p}_3 denotes the highest rate of poverty reduction, \bar{p}_2 the next highest, and so forth. Thus \bar{p}_3 is preferred to \bar{p}_2 , which is preferred to \bar{p}_1 .

Now consider the set of alternatives among which the policymaker can choose. The combinations of growth per capita and changes in inequality that are available will depend on the structure of the economy, the nature of the country's politics, and its social norms. The dependence on economic structure is obvious, but politics enters as well in that some changes in inequality (positive or negative) may produce social discontent so great that output growth will be halted or even reversed. It must be accepted that the current stage of development of social science provides limited understanding of the true shape and position of this choice set. It seems clear that the set of available combinations of y and g will look quite different for countries with different histories and different economic and social structures; and for a given country it will presumably change over time.

Figure 2
Maximising poverty reduction I

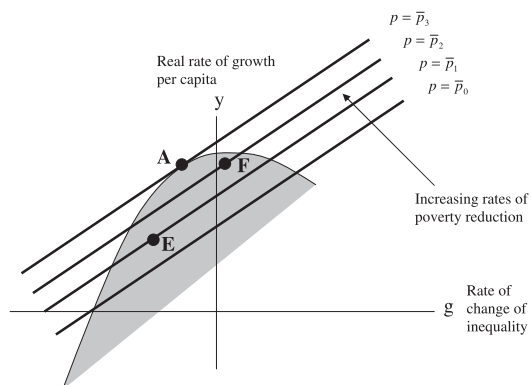
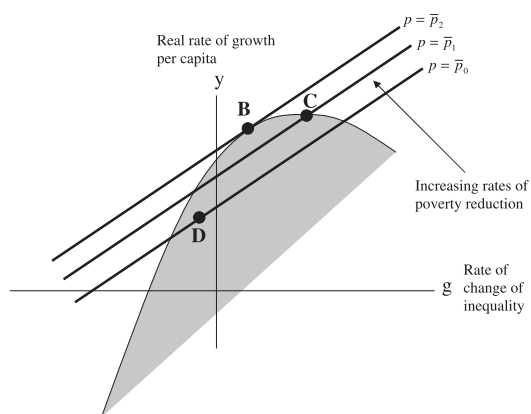


Figure 3
Maximising poverty reduction II



Figures 2 and 3 provide two hypothetical examples of what the set of available alternatives might look like. Each seems plausible, but that is about all that can be claimed for them. The key assumption is that the choice set is convex. The shaded area in each case is the set of combinations of y and g which can actually be attained over the medium term, taking into account all the relevant economic, social and political interactions that influence these outcomes. The available choice set summarised by the shaded area thus represents the outcome for growth and inequality of all

policy options actually available. It should not be assumed that points on the frontier of the choice set are the only relevant ones. Points inside the frontier are relevant if the current set of policies has not generated a technically efficient combination of growth and change in inequality, viewed from the perspective of maximising poverty reduction.

The policy problem, as formulated here, is to choose the best of these available combinations—that which achieves the highest possible rate of poverty reduction. The preference map derived in Figure 1 is thus superimposed on each of Figures 2 and 3. In Figure 2 the optimal combination involves inequality reduction, at point A, while in Figure 3 the most rapid poverty reduction is achieved at point B, with an increase in inequality.

From this simple framework some useful insights can be gained. First, it is clear that achieving the highest possible rate of poverty reduction could involve either a reduction or an increase in inequality. The answer depends on the slope of the indifference curves and the shape of the available choice set, which depend very much on local economic, social, and political circumstances. It would surely be absurd to make strong *a priori* assertions one way or the other about whether cases like Figures 2 or 3 are more likely. Second, the maximum rate of poverty reduction will virtually never be achieved by maximising the rate of economic growth, if such a maximum exists. In Figure 3, for example, the rate of growth is maximised at point C, where the slope of the frontier of the choice set is zero. But the optimum will be a point of tangency where the slope is positive—at which point some growth is being sacrificed in return for lower inequality. This feature of the optimal solution follows from the positive slope of the indifference curves.⁷

7 The positive slope derives from the fact that the elasticity $\eta_{PY} < 0$ and $\eta_{PG} > 0$. It can be shown that the latter requires that the poverty line is less than the mean of the distribution. When the poverty line is equal to the mean of the distribution, $\eta_{PG} = 0$, the indifference curves will be horizontal, and the optimum will correspond to the maximum growth rate.

8 The Dollar and Kraay (2002) empirical finding of stable inequality contradicts this trickle down characterisation of growth. Strangely, Kakwani and Pernia cite the Dollar and Kraay results as supporting the trickle down view and then dismiss the validity of the Dollar-Kraay findings on the grounds that: 'cross-country regressions are generally indicative of average trends; individual country experiences can vary quite significantly' (p.3). Dollar and Kraay also make this point and explicitly reject the trickle down view.

Defining pro-poor growth

Two influential studies are reviewed: one from the Asian Development Bank (Kakwani and Pernia 2000) and one from the World Bank (Ravallion and Chen 2001). In view of the lack of a clear definition in previous writings on pro-poor growth, these contributions are important. Both begin their analysis with the distribution of real household incomes per capita or real household expenditures per capita, depending on which of these variables is used to measure poverty. Growth means an increase in the mean value of this variable and inequality means variance in its distribution around the mean.

The Kakwani-Pernia definition

Kakwani and Pernia (2000) provide a welcome attempt to define pro-poor growth and to explore its implications. They motivate their analysis by describing earlier, market-oriented development thinking and practice as the trickle down approach, implying that growth produces a vertical flow of income from the rich to the poor. Although the poor may receive some benefit from this process and poverty incidence may actually decline, 'the proportional benefits of growth going to the poor will always be less.' (p.2). Obviously, this characterisation of the development process implies that inequality will consistently increase with growth.⁸

The growth process that results from market forces generally benefits the rich proportionately more than the poor . . . Consequently the gap in well-being between the poor and the rich tends to persist, if not widen, over time. To foster the well-being of society, governments need to pursue policies that will reduce this gap.

Promoting pro-poor growth requires a strategy that is deliberately biased in favor of the poor so that the poor benefit proportionately more than the rich. Such an outcome would rapidly reduce the incidence of poverty so that those at the bottom end of the distribution curve of consumption would have the resources to meet their minimum basic needs (Kakwani and Pernia 2000:3).

Thus, Kakwani and Pernia are saying that when growth is not pro-poor—meaning that it benefits the rich proportionately more than the poor—a pro-poor growth strategy is needed to counteract this erstwhile bias in favour of the rich. Doing so will produce a higher rate of poverty reduction than would occur without a pro-poor strategy. It is important to note that Kakwani and Pernia are not proposing that reducing inequality (the gap between poor and rich) should be adopted as the ultimate objective. Rather, they are claiming that implementing policies that reduce inequality, and are thus pro-poor, will help achieve the reduction of absolute poverty. They accept that growth that is not pro-poor might reduce poverty, but their argument is that by making growth pro-poor, or more so, the rate of poverty reduction can be increased.

To assist in achieving pro-poor growth, Kakwani and Pernia propose a measure of ‘pro-poorness’, called an index of pro-poor growth. It is claimed that outcomes with higher values of the index should be preferred to those with lower values because the former are more effective at reducing poverty. Kakwani and Pernia suggest that this analysis has widespread applicability:

The pro-poor growth index can be utilized to formulate pro-poor policies at both the macro and micro levels. The index can be calculated for any sector or region within a country. It can be used to monitor whether a particular sector or region is experiencing pro-poor growth. It could also allow one to assess the impact of a project on pro-poor growth (Kakwani and Pernia 2000:13).

In general, the proposed index measures the degree of ‘pro-poorness’ and should be used as a tool to maximize the extent of poverty reduction. In the selection of projects, the objective should

be to maximize the pro-poor growth index by minimizing any adverse distributional effects (Kakwani and Pernia 2000:13).

That is, Kakwani and Pernia claim that in choosing among mutually exclusive projects or between mutually exclusive policy strategies, selecting the one where their pro-poor growth index is highest will reduce poverty the most.

Kakwani and Pernia apply their proposed measure to data from Thailand, Lao PDR and Korea. Their results indicate that for Thailand and Lao PDR their index of pro-poor growth is smaller than 1 and that for Korea it is greater than 1. In the cases of Thailand and Lao PDR, they conclude that although poverty incidence declined over the period covered by their calculations:

The implication is that poverty reduction would have been even faster if the governments had followed pro-poor policies, or avoided policies with adverse consequences on income distribution (Kakwani and Pernia 2000:13).

Of course, terms like pro-poor policies or pro-poor growth may be defined in any way. But since Kakwani and Pernia are proposing that policy actually be directed towards achieving pro-poor growth, as they define it, a review of the implications of this proposal is appropriate. Kakwani and Pernia begin with a decomposition of proportional changes in poverty incidence into a growth component and an inequality component, similarly to equation (2), above.⁹ Using the notation developed above, their index can now be understood as follows. From equation (2), consider the proportions of the observed rate of poverty reduction that can be attributed to growth and changes in inequality: $\eta_{pY}y/p$ and $\eta_{pG}g/p$, respectively. Denoting these proportionate contributions π_Y and π_G , respectively, then $\pi_Y + \pi_G = 1$. The index of pro-poor growth is the inverse of the first of these proportions. It is the ratio of the rate of poverty reduction to the contribution that growth makes to poverty reduction. Thus,

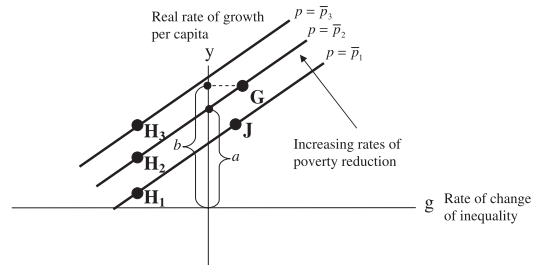
$$\phi = 1/\pi_Y = 1/(1 - \pi_G) = p/\eta_{pY}y. \quad (4)$$

9 Kakwani and Pernia emphasise that by inequality they do not necessarily mean the well-known Gini coefficient of inequality, which they criticise (2000:13–14). See also Fields (1980).

If inequality does not change, growth will account for all of the observed change in poverty ($\pi_Y = 1$) and the index will be exactly 1. Kakwani and Pernia say that growth should be considered pro-poor when $\phi > 1$, 'meaning that the poor benefit proportionately more than the non-poor, i.e. growth results in a redistribution in favour of the poor. This would be the first-best outcome.' (p.6). Clearly, by this definition, growth will be pro-poor ($\phi > 1$) if and only if inequality is declining.¹⁰ Further, it will be more pro-poor if the proportion of poverty reduction accounted for by growth is small and thus the proportion accounted for by reductions in inequality is large. Similarly, Kakwani (2001) states that growth is pro-poor when it reduces inequality; and Kakwani and Son (2002) say that growth is pro-poor when $\phi > 1$, which occurs when inequality declines, and not pro-poor if $\phi < 1$, which occurs when inequality rises.¹¹

Suppose it was accepted that pro-poor growth meant outcomes where $\phi > 1$ and that achieving this form of growth should be adopted as an objective of economic policy. Would this be equivalent to maximising the rate of poverty reduction? A comparison of Figures 2 and 3 shows immediately that it would not. The outcome that maximises the rate of poverty reduction might be pro-poor by the Kakwani-Pernia definition, as in Figure 2, or it might not, as in Figure 3. If the set of available growth and inequality combinations took the form shown in Figure 3, the highest rate of poverty reduction would be achieved at B, which is not pro-poor (inequality is rising). In this case, any available outcome that is pro-poor would result in lower poverty reduction than point B. For example, point D is pro-poor (inequality

Figure 4
The Kakwani-Pernia index of pro-poor growth



is declining), but the rate of poverty reduction at D is lower than at B.¹² But suppose that the policy that maximises poverty-reduction is indeed pro-poor (inequality-reducing) as occurs in Figure 2 at point A. Now compare two non-optimal points such as E (pro-poor) and F (not pro-poor). Contrary to the pro-poor index, poverty reduction is higher at F.

Figure 4 is helpful in understanding these concepts more fully. It repeats the preference map shown in Figure 1, together with a hypothetical combination of growth and inequality, at point G, leading to the rate of poverty reduction \bar{p}_2 . The vertical intercept of this indifference curve is given by the distance a , which (from equation (2), above) is equivalent to \bar{p}_2 / η_{PY} . The rate of growth corresponding to point G is the vertical distance b . Thus the ratio of these two vertical distances is $a/b = \bar{p}_2 / \eta_{PY} y = \phi$. It is obvious from the diagram that $a/b < 1$ whenever the growth-inequality outcome is to the right of the vertical axis, meaning that inequality is rising, and that $a/b > 1$ whenever the outcome is to the left of the vertical axis, meaning that inequality is declining.

10 It is clear that $\infty > \phi > 1$ as $1 > \pi_G > 0$ or, equivalently, $\pi_Y < 1$. But recalling that with poverty declining, $p < 0$, then since $\eta_{PG} > 0$, $\pi_G = \eta_{PG}g/p$ will be positive if and only if $g < 0$. Similarly, $0 > \phi \geq 1$ if and only if $g > 0$.

11 Strangely, in their concluding section (p.13), Kakwani and Pernia amend the wording used to describe different values of their index. They describe the outcome $\phi > 1$ as strictly pro-poor, but comment that 'imposing an index value that is greater than 1 (i.e. strictly pro-poor) though ideal, may be too stringent'. They then propose the classification: negative values of ϕ are anti-poor, values between 0 and 0.33 are weakly pro-poor, values 0.33 to 0.66 are moderately pro-poor, values 0.66 to 1 are pro-poor and values greater than or equal to 1 are highly pro-poor. Despite the inconsistency of wording, the point remains that higher values of the index are claimed to be superior to lower values because they correspond to greater poverty reduction.

12 As noted above, poverty reduction would also not be maximised at point C, the point at which the growth rate is maximised.

Consider the values of the Kakwani-Pernia pro-poor index within the pro-poor section of the diagram, which corresponds to declining inequality. Would the index of pro-poor growth assist in locating points of greatest poverty reduction? Confining ourselves to outcomes where growth is positive, as Kakwani and Pernia do, suppose that points H_1 , H_2 and H_3 were all within the available choice set. These points are arranged vertically, so that the rate of inequality reduction is the same for all three. Compare the values of the Kakwani-Pernia pro-poor index at these three points. The index is greater than 1 at all three, but from the above discussion it is easily seen that it is highest at H_1 , followed by H_2 , followed by H_3 .¹³ But the rate of poverty reduction is the highest at H_3 and the lowest at H_1 . If the Kakwani-Pernia index were used to rank these three points, it would choose the point resulting in the smallest rate of poverty reduction.¹⁴

Now consider the values of the Kakwani-Pernia pro-poor index within the non-pro poor section of the diagram, corresponding to increasing inequality. Compare points G and J. At both points inequality is rising, growth is positive and poverty incidence is falling, so $0 < \phi < 1$ for both points. Consider moving point G outwards along the indifference curve $p = \bar{p}_2$, away from the vertical axis (in a northeasterly direction). Since all such points remain on the same indifference curve, the rate of poverty reduction remains the same. The index of pro-poor growth, however, declines steadily as G moves outwards. The index will remain between 0 and 1, but aside from this there is no lower bound to the values it could take.

Suppose we choose a point where the index is, say, 0.5.

Next, consider point J, lying on the lower indifference curve $p = \bar{p}_1$. Moving J along this indifference curve towards the vertical axis (in a southwesterly direction), as J approaches the vertical axis, the vertical intercept (distance a) becomes close to the level of growth (distance b) but remains smaller than it. By placing J sufficiently close to the vertical axis, the value of ϕ can be made arbitrarily close to 1, say, 0.9. Ranking these points according to the Kakwani-Pernia index chooses point J, where the increase in inequality is smaller but where the rate of poverty reduction is also lower.¹⁵

Further insight into the meaning of these concepts is obtained by using equation (2):

$$\phi = p / \eta_{PY}y = (\eta_{PY}y + \eta_{PCG}g) / \eta_{PY}y = 1 + \eta_{PCG}g / \eta_{PY}y. \quad (5)$$

Thus

$$p = \eta_{PY}y(1 + \eta_{PCG}g / \eta_{PY}y) = \eta_{PY}y\phi. \quad (6)$$

That is, the rate of change of poverty incidence is the product of three terms: the elasticity of poverty incidence with respect to mean household income, the rate of growth of mean household incomes, and the Kakwani-Pernia index of pro-poor growth, ϕ . The parameter η_{PY} may be considered locally constant. Alternative policies or projects will face the same value of it, but will differ regarding ϕ and y . Maximising the rate of poverty reduction means selecting the policy/project where the product of ϕ and y is the highest. Selecting only those policies or projects for which $\phi > 1$, regardless

13 Among points resulting in this rate of inequality reduction (arranged on this vertical line) the highest values of the index occur at points closest to the horizontal axis, at which the rate of growth (distance b) is lowest. Among these points, these are the outcomes of smallest poverty reduction. As the horizontal axis is approached, the value of the index approaches infinity. It follows that the value of ϕ is not maximised at the optimum, point A.

14 It would be incorrect to suppose that applying the Kakwani-Pernia index maximises the rate of inequality reduction. Consider two points in the pro-poor (northwestern) quadrant of Figure 4, K and L. Point K is located well above the horizontal axis. Now compare it with point L, lying to the right of K, thus corresponding to a lower level of inequality reduction, but still to the left of the vertical axis. Let the value of ϕ at point K be ϕ_K . Now move point L vertically towards the horizontal axis, thus holding the rate of inequality reduction constant. As L approaches the horizontal axis, the value of ϕ_L approaches infinity. Thus higher values of ϕ do not necessarily indicate higher rates of inequality reduction.

15 Similarly, moving say point E₁ along the indifference curve $p = \bar{p}_1$ but remaining within the northwestern quadrant, the value of ϕ will span the interval $1 < \phi < \infty$, approaching 1 as the point approaches the vertical axis and ∞ as it approaches the horizontal axis. But the rate of poverty reduction remains the same.

of the value of y , will not achieve this result. The values of *both* ϕ and y are relevant.

A simple numerical example may be helpful. Suppose $\eta_{PY} = -1$ and $\eta_{PG} = 1$. Now consider two mutually exclusive policies or projects, A and B. Policy A raises mean household incomes by 3 per cent and *raises* the Gini coefficient by 0.5 per cent. Policy B raises household incomes by 1 per cent and *lowers* the Gini coefficient by 0.5 per cent. From equation (5), the value of ϕ for Policy A is $\phi_A = 1 - 1/6 = 0.84$. For policy B it is $\phi_B = 1 + 1/2 = 1.5$. But from equation (2) the rate of poverty reduction from Policy A is 2.5 per cent while for Policy B it is 1.5 per cent. In this example, the project or policy that is not pro-poor generates higher poverty reduction than the project/policy that is pro-poor, because the former achieves a growth rate large enough to overcome the fact that it increases inequality.¹⁶

The Kakwani-Pernia definition of pro-poor growth and the proposed measure of pro-poor growth based on it must be rejected as goals of policy. Contrary to the claims made for it, this measure fails to provide correct guidance as to which outcomes reduce poverty the most. The suggestion that policies or projects be assessed in terms of this measure places excessive emphasis on inequality reduction and is inconsistent with the objective of maximising the rate of poverty reduction.

The Ravallion-Chen definition

Ravallion and Chen (2001) address the question of whether a given change in the distribution of household incomes is pro-poor (by which they mean poverty-reducing). They make the following assumptions:

- (i) A measure of pro-poor growth should be consistent with the way aggregate

poverty is measured in that 'a reduction (increase) in poverty must register a positive (negative) rate of pro-poor growth' (2001:4).

- (ii) The measure of pro-poor growth should satisfy three axioms for poverty measurement advanced in a famous theoretical paper by Sen (1976): the *focus axiom*, which states that the measure is unaffected by income changes for the non-poor; the *monotonicity axiom*, which states that any income gain to the poor will reduce poverty; and the *transfer axiom*, which states that inequality-reducing transfers amongst the poor will reduce poverty.

The most conventional measure of poverty incidence is the headcount index, described above. It is the first of the Foster, Greer and Thorbecke (FGT) class of measures and changes only when there is a net movement of household incomes across the poverty line. For example, if the number of households whose incomes move from levels below the poverty line to levels above it exceeds the number moving in the opposite direction, then the headcount measure registers a reduction in poverty. Ravallion and Chen point out that the headcount measure will fail Sen's monotonicity and transfer axioms. They reject the headcount measure on these grounds, thus motivating their search for an alternative that satisfies all three of the Sen axioms cited under their assumption (ii).

Although the Sen axioms seem broadly reasonable, it is not obvious why they should be accorded the level of sanctity that Ravallion and Chen attribute to them.¹⁷ In any case, the second of the FGT class of measures, the poverty gap measure, seemingly satisfies all three of the Sen axioms and it also satisfies the conditions for decomposability described by FGT, which Ravallion and Chen's proposed

16 It would be wrong to conclude from this that changes in inequality should be ignored. Selection according to the rate of growth of incomes alone could similarly result in less benefit to the poor. Consider Policy C, which is the same as Policy A except that it generates growth of incomes of 2 per cent. Then $\phi_C = 1 - 1/2 = 0.5$. From equation (6), Policy C generates a rate of poverty reduction of 1 per cent. Suppose we were comparing just Policies B and C. If Policy C were preferred on the grounds of higher growth of average incomes, less poverty reduction would be achieved than from Policy B.

17 The headcount index does meet the monotonicity axiom in a weakened form: an income gain to the poor cannot increase poverty. But it will not meet the transfer axiom even in weakened form: an inequality-increasing transfer among the poor (from a household well below the poverty line to one just below it) could reduce poverty.

alternative lacks. Further, the poverty gap measure is already well known and in wide use. Strangely, Ravallion and Chen make no mention of the poverty gap measure. Instead, they propose yet another measure, close but not identical to the poverty gap measure. The Ravallion and Chen discussion thus confuses the search for a measure of pro-poor growth with a seemingly unnecessary search for an alternative measure of poverty.

Ravallion and Chen begin their analysis with the construction of a Growth Incidence Curve, which shows the growth rate of the income of each household across the entire population. Now consider households within this distribution that were poor in the initial period. Ravallion and Chen calculate the mean of the growth rates of the incomes of all these households and call this the rate of pro-poor growth. The Ravallion-Chen measure is different from the rate of growth of the mean income of the poor (the measure used by Dollar and Kraay (2000), defining the poor to be the poorest 20 per cent of the population), for the following reason.

Assume that all households are arranged by initial income per person, subsequently referred to simply as household income, where household 1 is the poorest and household H_z is the richest household whose initial income is below the poverty line, z . The mean growth rate of the incomes of the poor (Ravallion and Chen's measure of the rate of pro-poor growth) is given by

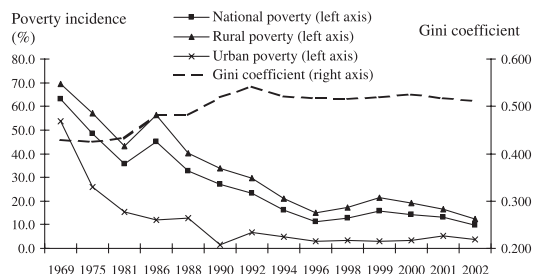
$$\bar{y}_z = \frac{1}{H_z} \sum_{h=1}^{H_z} y_h, \quad (7)$$

where $y_h = dY_h/Y_h$ denotes the growth rate of the income of poor household h , and Y_h is the initial level of that household's income. The subscript z on \bar{y}_z is a reminder that the measure is defined only over households with incomes below the poverty line, z . The mean of the incomes of the poor is given by

$$\bar{Y}_z = \frac{1}{H_z} \sum_{h=1}^{H_z} Y_h, \quad (8)$$

and its growth rate is therefore

Figure 5
Thailand: poverty incidence and inequality, 1969 to 2002



Source: National Economic and Social Development Board, Bangkok, based on household income data collected in the Socio-economic Survey.

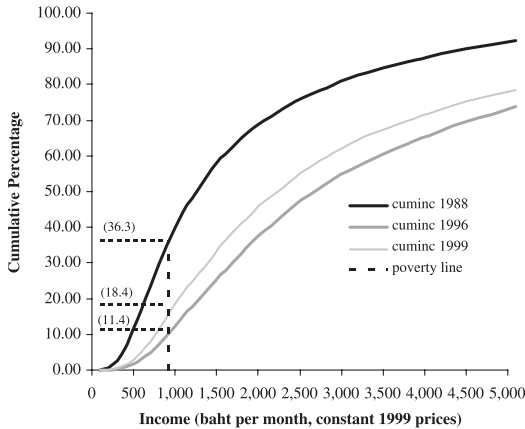
$$\hat{Y}_z = \frac{1}{H_z} \sum_{h=1}^{H_z} (Y_h/\bar{Y}_z)y_h. \quad (9)$$

The Ravallion-Chen proposed measure (the mean of the growth rates of the incomes of poor households) weights the household income growth rates equally for all poor households, regardless of their initial income level, whereas the growth rate of the mean income of the poor weights these growth rates according to the initial level of that poor household's income. The Ravallion-Chen measure is thus more distributionally sensitive than the growth rate of the mean of the incomes of the poor. If the growth rates of the higher income households among the poor tend to exceed those of lower income households among the poor, the Ravallion-Chen measure will be smaller than \hat{Y}_z (equation (9)), and conversely if poorer households' incomes tend to grow more rapidly.

To illustrate the Ravallion-Chen approach, an application using data for Thailand will now be discussed. As background, Figure 5 summarises the history of poverty incidence and inequality in Thailand over the full period for which data are available on a comparable basis. This covers the period 1969 to 2002. Figure 6 then shows the cumulative distribution functions of household incomes per person for three years of particular interest, 1988, 1996 and 1999. They are each shown in constant

Figure 6

Thailand: cumulative distribution of household incomes per person, 1988, 1996 and 1999



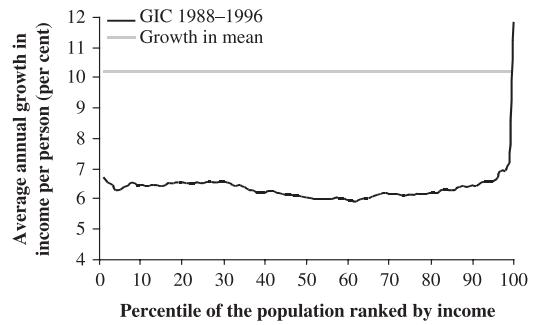
Source: Calculated from data from Socio-economic Surveys, National Statistical Office, Bangkok.

1999 prices, along with the official poverty line in 1999 prices. The intersection of the poverty line with the cumulative density functions gives the poverty incidence for each year.¹⁸

During the first period, 1988 to 1996, the Thai economy boomed and was the fastest growing in the world. During the second period, 1996 to 1999, now known as the Thai crisis, this boom collapsed and output contracted (Warr 2005). Poverty incidence declined dramatically during the boom, from 36.3 per cent in 1988 to 11.4 per cent in 1999. We shall focus on the boom. Inequality increased during this period and this feature of the Thai boom has attracted widespread criticism. Figure 7 presents the Growth Incidence Curve suggested by Ravallion and Chen for this boom period. It shows that the proportional change in incomes is relatively constant over most of the distribution, but increases sharply for just the richest two percentiles. The very rich benefited disproportionately from the boom. This diagram, suggested by Ravallion

Figure 7

Thailand: growth incidence curve—the boom, 1988 to 1996



Source: Author's calculations using data from Socio-economic Surveys, National Statistical Office, Bangkok.

and Chen, is particularly helpful in describing the distributional features of this episode.

Table 1 summarises the results of the calculations proposed by Ravallion and Chen, based on these data. All of the results are calculations of growth rates per person. The first four rows present the growth rates of mean incomes for the whole population (row 1) and the population initially below the poverty line (row 2). The next rows show the mean of the growth rates of household incomes for the whole population (row 3) and the population initially below the poverty line (row 4). For comparison, the last row shows the growth rate of real GDP per person. Comparison of the growth rate of mean incomes with that of GDP shows that the two are quite different. For the boom period, Ravallion and Chen's pro-poor growth rate (row 4) is somewhat below the growth rates of average incomes and moderately below the growth rate of GDP. This reflects the well-known increase in inequality that occurred during the boom period.

These calculations facilitate a summary of the distributional outcomes of economic changes, but their contribution to the search for the most poverty-reducing forms of economic growth seems remote. The headcount index of

¹⁸ The results of these calculations differ slightly from official data on poverty incidence because the official data use household-specific poverty lines in their calculations. However, the results are very similar.

Table 1
Thailand: Rates of pro-poor growth, Ravallion and Chen method, 1988 to 1996
(constant 1999 prices, per cent, per person, per year)

	1988–1996
Growth rate of mean income per person of whole population	10.22
Growth rate of mean income per person of poor	8.66
Mean of growth rate of incomes per person of whole population	6.38
Mean of growth rate of incomes per person of the poor (<i>Pro-poor growth</i>)	6.49
Growth rate of real GDP per person	7.66

Source: Author's calculations using data from Socio-economic Surveys, National Statistical Office, Bangkok and national accounts, National Economic and Social Development Board, Bangkok.

poverty incidence has well known limitations but the Ravallion-Chen rejection of it is unconvincing in view of its widespread acceptance. The measure proposed by Ravallion and Chen seems similar to the well-known poverty gap measure and despite the conceptual difference between the poverty gap and headcount measures, numerous empirical studies have shown their movements to be closely correlated. In view of the analytical advantages of the FGT class of measures and their widespread use, replacing them with the Ravallion-Chen proposed measure would not seem helpful. The search for a measure of pro-poor growth is not motivated by dissatisfaction with the headcount index of poverty incidence. Rather, it is motivated by the search for a measure of growth that is consistent with the goal of poverty reduction, which may well mean a reduction in the headcount index. In the following section such a measure is proposed.

An alternative measure of pro-poor growth

The definition of pro-poor growth that makes sense is growth that reduces poverty. It is possible for reductions in inequality to enhance the poverty-reducing capacity of growth. It is also possible for increases in inequality to erode some of the poverty reduction that growth would otherwise produce. It is even conceivable that the increase in inequality

could be sufficient to eliminate or even reverse the reduction in poverty, though reliable empirical examples of this outcome are not easily found, except over brief periods. The search for a measure of pro-poor growth is the search for a measure of growth that allows for these possibilities. This measure should be consistent with the goal of poverty reduction. That is, it should have the property that poverty declines whenever this measure is positive, poverty rises whenever the measure is negative, and higher values of the measure should indicate higher rates of poverty reduction.

Returning to equation (2), and recalling that it approximates the proportional change in poverty incidence, it is noted that the parameter η_{PY} , the poverty elasticity of growth, can be considered locally constant: all projects or policies will face the same value of it. Dividing both sides of equation (2) by this parameter gives an expression for the inequality-adjusted growth rate:

$$y^p = p/\eta_{PY} = y + g\eta_{PG}/\eta_{PY}. \quad (10)$$

By construction, the inequality-adjusted growth rate must indicate the direction and magnitude of the change of poverty incidence. When it is positive, poverty incidence must be declining (recalling that the sign of η_{PY} is negative and that poverty reduction means $p < 0$). Moreover, the larger the inequality-adjusted growth rate, the larger the poverty reduction

Table 2
Thailand: data used for case study, 1988 to 1996

	1988	1996	Period rate of change (per cent)	Annual rate of change (per cent per year)
Poverty incidence (per cent)	36.29	11.37	-68.67	-8.58
Mean income (baht, 1988 prices)	2140	4661	117.80	14.72
Gini coefficient	0.482	0.518	7.47	0.93

Source: Author's calculations using data from Socio-economic Surveys, National Statistical Office, Bangkok.

that results. The measure works, in principle, for any measure of absolute poverty, P , and any measure of inequality, G .

Consider the last term, $g\eta_{PG}/\eta_{PG}$, which can be called the inequality adjustment. Since $\eta_{PG} > 0$ and $\eta_{PY} < 0$, this term will be negative if inequality increases ($g > 0$) and positive if inequality declines ($g < 0$). Its economic meaning is the rate of change of inequality multiplied by the marginal rate of substitution between changes in inequality and growth, derived on the assumption that poverty reduction is the objective. Intuitively, multiplying the rate of change of inequality by this marginal rate of substitution converts units of change of inequality into units of change of output (growth), at a rate that reflects their respective values. Since poverty reduction is the assumed objective, value means their marginal contributions to poverty reduction. Diagrammatically, the proposed measure corresponds to the vertical intercepts p/η_{PY} of the indifference curves shown in Figures 1 to 4.

Suppose that conventional growth is positive ($y > 0$) but that inequality increases. The inequality adjustment is therefore negative. There are then two possibilities. The outcome observed most regularly is that poverty still declines, implying that the inequality adjustment is smaller in absolute value than the conventional growth rate, y . This outcome means that increased inequality has reduced the poverty-reducing power of the growth that has occurred but not eliminated it. The inequality-adjusted growth rate will still be positive but smaller than the conventional growth rate.

Alternatively, if the increase in inequality is large enough, the inequality adjustment could exceed the conventional growth rate and the inequality-adjusted growth rate would then be negative. Poverty incidence will rise. Finally, if inequality declines, enhancing the poverty-reducing power of growth, the inequality-adjusted growth rate will exceed the conventional growth rate.

To illustrate the use of the inequality-adjusted growth rate, the method outlined above is applied to Thai data for the boom period of 1988 to 1996. As described previously, this was a period of rapid growth combined with rising inequality. The outcome was a dramatic decline in poverty incidence, despite the increase in inequality. First, the elasticities η_{PY} and η_{PG} are estimated from the 1988 and 1996 data and are then used to estimate the inequality-adjusted growth rate over this period. The data on poverty, growth and inequality used for this exercise are summarised in Table 2.

First, a log-normal distribution was fitted to the Thai cumulative income distributions for 1988 and 1996 shown in Figure 6. The values of the elasticities η_{PY} and η_{PG} were computed from the parameters of these fitted distributions. In general, as noted above, equation (2) holds only as an approximation and holds exactly only in the case of a two parameter distribution.¹⁹ The log-normal distribution is such an example and fits the data for Thailand reasonably well. The estimated parameters are presented in Table 3. Because the values of the estimated parameters changed noticeably between 1988 and 1996, the analysis of the

Table 3
Thailand: elasticity estimates, 1988 and 1996

	1988	1996	Period Average
Growth elasticity (η_{PY})	-1.348	-1.906	-1.627
Inequality elasticity (η_{PG})	0.660	2.565	1.613

Source: Author's calculations.

Table 4
Thailand: decomposition of changes in poverty, 1988 to 1996

	Annual rate of change (per cent per year)	Per cent of p
Estimated p	-14.38	100
Growth component $\eta_{PY}Y$	-15.84	110.1
Inequality component $\eta_{PG}G$	1.45	-10.1
Residual	-0.13	0.9

Source: Author's calculations.

interval between these points is based on the mean values of the estimated parameters for these two years. Equation (2) is then used to predict the change in poverty incidence between 1988 and 1996 that results from the estimated parameter values and the data on growth and changes in inequality, applied to equation (2). The results are shown in Table 4. Using these estimates, the observed change in poverty incidence is predicted almost exactly, with a residual of just under 1 per cent.

During the boom, incomes grew by 9.73 per cent. At the same time, the Gini coefficient of inequality increased from 0.48 to 0.52, an annual rate of 0.9 per cent but poverty incidence nevertheless declined from 36.3 to 11.4 per cent, at the extraordinary annual rate of decline of 14.5 per cent. It is obvious that poverty reduction would have been even faster without this increase in inequality: but by what magnitude? Applying equation (2), the estimates in Table 4 show that if inequality

had remained stationary, poverty would have declined at 15.84 per cent per year. The increase in inequality reduced the annual rate of decline of poverty incidence by 1.45 per cent, a reduction of a little under one tenth.

Using equation (10), the inequality-adjusted growth rate is calculated at 8.82 per cent per year, compared with the conventional growth rate of 9.7 per cent. That is, the increase in inequality that occurred over this period, widely considered alarming, lowered the poverty-reducing power of growth by about one tenth. Increases in inequality of this magnitude may well be alarming for social reasons, but they are far too small to prevent poverty incidence from falling, given the rate at which output was expanding.

Using these estimates, a further question may now be answered. How much would inequality have had to increase for the reduction in poverty to have been eliminated, given the observed rate of growth of incomes? From

19 In general, the change in poverty incidence will also depend on the initial level of inequality (Ravallion 1997) and the distance between the poverty line and the mean of the distribution (Bourguignon 2001).

equation (2), we set $p = 0$ and rearrange, giving the critical rate of change in inequality as

$$g^0 = -y\eta_{PY}/\eta_{PG}. \quad (11)$$

Substituting the data from the example, the critical increase in the Gini coefficient is thus 9.82 per cent per year, or 78.5 per cent over 8 years. That is, inequality would have had to increase at over 10 times the rate that it actually did increase for the poverty-reducing power of growth to be eliminated. An increase in inequality at this rate would surely be impossible. If it occurred over 8 years, the terminal value of the Gini coefficient would be 0.86, a level of inequality that has never been recorded for any country.

Conclusions

For most observers of economic affairs, the meaning of pro-poor growth may seem obvious. It is growth of economic output that benefits the poor. If the reduction in absolute poverty is accepted as the measure of benefit for the poor, the greater the reduction in poverty incidence that growth generates, the more pro-poor it is. Since economic growth generally does benefit the poor to some degree, the important empirical question is not whether growth is or is not pro-poor, but what influences the extent to which it is pro-poor (Ravallion 2004; Timmer 2004). The search is thus to find the kinds of economic growth for which the rate of poverty reduction is greatest, as well

as to find the economic policy strategies that can produce growth of this kind (Eastwood and Lipton 2000).

For reasons that are not always apparent, the literature on pro-poor growth tends to discard this seemingly natural way of defining and measuring pro-poor growth. It gives very little attention to the nature of economic growth itself. Instead, it is preoccupied with statistical evaluations of the outcomes of economic events, focussing on the changes in the distribution of household incomes that result from these outcomes. The resulting literature distracts attention from the central objective of reducing poverty because it has little to say about which forms of economic growth and which policy regimes are best at reducing poverty.

A central confusion pervades the discussion of pro-poor growth: whether inequality reduction is valued as a means for achieving poverty reduction or whether it is desired as an end in itself. If it is the former, as is usually argued, then much of the literature on pro-poor growth overstates the importance of inequality reduction for the achievement of poverty reduction. Growth that is most effective at reducing poverty does not necessarily coincide with growth that reduces inequality.

What is most needed is solidly based empirical research on the manner and extent to which alternative growth strategies influence the rate of poverty reduction. The most fruitful approach would be to study directly the experience of poverty reduction in particular countries and its relationship to the economic policies in place.

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