Pro-Poor Growth: A Primer

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These days it seems that almost everyone in the development community is talking about "pro-poor growth." What exactly is it, and how can we measure it? Is ordinary economic growth always "pro-poor growth" or is that some special kind of growth? And if it is something special, what makes it happen? The paper first reviews alternative approaches to defining and measuring "pro-poor growth." It then turns to the evidence on whether growth is pro-poor, what factors make it more pro-poor (including the role played by both initial inequality and changing inequality), and whether the things that make the distribution of the gains from growth more pro-poor come at a cost to the rate of growth. Some priorities for future research are identified.

Introduction

One finds two quite different definitions of "pro-poor growth" in recent literature and policy-oriented discussions. By <u>definition 1</u>, "pro-poor growth" means that poverty falls more than it would have if all incomes had grown at the same rate (Baulch and McCullock, 2000; Kakwani and Pernia, 2000). By <u>definition 2</u>, "pro-poor growth" is growth that reduces poverty (Ravallion and Chen, 2003).

The first definition focuses on the distributional shifts during the growth process; roughly speaking, for growth to be deemed "pro-poor" by Definition 1 the incomes of the poor should grow at a higher rate than those of the nonpoor. A concern with this definition is that rising inequality during a period of overall economic expansion may come with large absolute gains to the poor yet this is not deemed to be "pro-poor growth." (Similarly, a recession will be deemed pro-poor if poor people lose proportionately less than others, even though they are in fact worse off.) Definition 2 avoids this problem by focusing instead on what happens to poverty. The extent to which growth is pro-poor then depends on how much a chosen measure of poverty changes. Naturally this will depend in part on what happens to distribution, but only in part — it will also depend on what happens to average living standards.

Both definitions beg the question: What measure of poverty should be used? After first addressing that question and the implications for measuring the rate of pro-poor growth, the article turns to the evidence on whether growth is pro-poor by either definition, what factors make it more pro-poor, and whether they will come at a cost to growth.

How is pro-poor growth measured?

As normally defined, "poverty" means that one cannot afford certain pre-determined consumption needs. A key conceptual issue is how the poverty line is to be determined. Here

too there is a literature; for an overview of the theory and methods, see Ravallion (1994, 1998). A key issue in the present context is the distinction between "absolute poverty" and "relative poverty." By absolute poverty one means that the poverty line has fixed purchasing power; two households with the same real income are both either "poor" or "not poor." The poverty line is typically chosen to assure that predetermined nutritional requirements are met, given prevailing diets. By relative poverty one means that the poverty line tends to have higher real value in less poor sub-groups. For example, the poverty line might be set as a constant proportion of mean income. This method can show rising poverty even when the levels of living of the poor have in fact risen. The discussion in this article will confine attention to absolute poverty.

Given a poverty line, how do we measure poverty? The most common measure in practice is the headcount index, given by the estimated proportion of the relevant population living in households with consumption or income below a predetermined poverty line. The headcount index tells us nothing about what has happened to distribution below the poverty line; for example, if the poorest person becomes poorer then the headcount index will not change. The poverty gap index (the mean income shortfall below the poverty line as a proportion of the line, counting the nonpoor has having zero shortfall) will better reflect changes in average levels of living among the poor. However, it will not reflect changes in distribution among the poor. Various measures of poverty have also been proposed that penalize inequality among the poor. The first such "distribution-sensitive" measure is the index introduced by Watts (1968). This is the population mean of the log of the ratio of the poverty line to censored income, where the latter is actual income for those below the poverty line and the poverty line for those above it (Appendix). Zheng (1993) shows that the Watts index is the only index that satisfies all the axioms for an ideal poverty measure that have been proposed in the literature.

Tools for studying pro-poor growth with micro data. Recognizing that there is a degree of uncertainty about the location of a poverty line, it can be important to look at impacts of aggregate economic growth over a wide range of the distribution. A useful tool for this purpose is the "growth incidence curve" introduced by Ravallion and Chen (2003). This gives the rate of growth over the relevant time period at each percentile of the distribution (ranked by income or consumption per person). Let $p_t = F_t(y)$ denote the proportion of the population at date *t* living below income *y* (i.e., $F_t(y)$ is the cumulative distribution of income at date *t*). Then the inverse of this function (sometimes called the "quantile function") gives $y_t = q_t(p)$, the income of the *p*'th percentile. For example, $q_t(0.5)$ is the median. Then the growth incidence curve (GIC) between dates *t* and *t*+1 gives the growth rate of the *p*'th percentile: $g_{t=1} = \ln[q_{t+1}(p)/q_t(p)]$. Thus at the 50th percentile, the GIC gives the growth rate of the median income. If the GIC is above the zero axis at all points up to some percentile p_t^* then poverty has fallen for all headcount indices up to p_t^* (or all poverty lines up to the value that yields p_t^* as the headcount index) and for all poverty measures within a broad class (applying a result found in Atkinson, 1987).

If one calculates the area under the growth incidence curve up to the headcount index then one obtains the total growth in incomes of the poor over the relevant period. The Ravallion-Chen (2003) "rate of pro-poor growth" is the mean growth rate of the poor. This gives the change in the Watts index per unit time divided by the headcount index. Notice that the mean growth rate of the poor is not the same thing as the growth rate in the mean for the poor, which will not in general be consistent with even the direction of change in any sensible measure of the level of poverty (Ravallion and Chen, 2003).

While the Watts index has (arguably) the most attractive properties of any poverty measure, it is still only one of the measures found in the literature. Another example of a distribution-sensitive measure is the popular Squared Poverty Gap (SPG) in which individual poverty gaps are weighted by the gaps themselves to penalize inequality amongst the poor (Foster et al., 1984). If we consider instead any measure within the Atkinson (1987) class of additive measures of poverty (including the headcount index, the Watts index and SPG) then one can define a measure of pro-poor growth as the weighted mean growth rate, as obtained by weighting each point on the growth incidence curve with the weights appropriate to the specific measure of poverty used (Kraay, 2003).

In describing the impact of economic growth on poverty it can also be useful to exploit the fact that a measure of poverty can be written as a function of the mean of the distribution on which that measure is based and the Lorenz curve of that distribution. (The Lorenz curve gives cumulative income shares as a function of the cumulative proportion of the population ranked by income.) This can be used to decompose changes in poverty over time into a component attributed to growth in the mean, changes in distribution and the interaction effect between these (Datt and Ravallion, 1992). The same mathematical properties of poverty measures can be used to measure the elasticity of poverty to growth in the mean, holding distribution constant (Kakwani, 1993) and to study the analytic properties of that elasticity (Bourguigon, 2001).

A growth process is said to be "distribution neutral" if the growth incidence curve is perfectly flat, in that incomes at all percentiles grow at the same rate, leaving inequality unchanged. The distributional change can be said to be "pro-poor" if the redistribution component is poverty reducing. Definition 1 is equivalent to requiring that the redistribution

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component in the Datt-Ravallion (1992) decomposition for changes in poverty is negative (using final point as reference).

Building on these concepts, the measure of the rate of pro-poor growth proposed by Ravallion and Chen (2003) equals the ordinary rate of growth times a "distributional correction" given by the ratio of the actual change in poverty over time to the change that would have been observed under distribution neutrality. If growth is pro-poor by Definition 1 then the rate of pro-poor growth exceeds the ordinary rate of growth. If the distributional shifts go against the poor then it is lower than the ordinary rate of growth. Thus one can think of measure of pro-poor growth based on Definition 2 as the product of a Definition 1-based measure and the ordinary rate of growth. We can write the following simple equation for the rate of pro-poor growth:

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\begin{array}{ccc}
\textit{Rate of pro-} & = \textit{Distributional} \quad \textbf{x} & \textit{Ordinary} \\
\textit{poor growth} & \textit{correction} & \textit{growth rate} \\
(\textit{Definition 2}) & (\textit{Definition 1}) &
\end{array}
$$

When poverty reduction is the objective (for which economic growth is one of the instruments) then the rate of pro-poor growth defined above is the right way to measure growth consistently with that objective.

Software packages are available to implement these various measures and decompositions. The right package to use depends on the form the data comes in. If it is grouped (tabulated) data then *Povcal* can be used; if it is micro data then the *Poverty Analysis Toolkit* should be used; both can be found at http://econ.worldbank.org/programs/poverty.

Data issues. Poverty is typically measured from the distribution of a comprehensive measure of real consumption or income (including imputed values for consumption or income in-kind, including from own production). This is obtained for randomly sampled households in a socio-economic survey. There is a large literature on the numerous conceptual and practical

issues that arise in the measurement of welfare using survey data.[1] Progress in improving the quality (including inter-temporal comparability) of data will be crucial to a better understanding of the issues raised in the following discussion.

The two or more surveys (at different dates) should of course be comparable, though it is not always clear what this means in practice. Certainly one should be wary of any changes in survey design (sampling or questionnaire design) that might bias assessments of the incidence of growth; this must be judged in each application.

One also needs a deflator for converting the nominal incomes obtained from the survey into real values. Typically a Consumer price Index (CPI) is used, though if relative prices changes appreciably during the time period then one should be concerned as to whether the CPI is weighted appropriately given that the poor tend to have different consumption patterns to the nonpoor. Ideally one would use a different price index at each level of income.

In studying the impact of growth on poverty, the growth rates can come from either the same surveys used to measure poverty or the national accounts. Using the surveys has the advantage that one is measuring growth in <u>household</u> income or consumption per person. Using surveys also means that time periods and definitions match perfectly with the poverty measures. National accounts by contrast capture much more than household income; even what is called "private consumption" in national accounts is typically calculated in such a way in developing countries that it includes a number of categories of consumption that are not attributable to households (Ravallion, 2003a; Deaton, 2004).

However, using surveys for the growth rates can also lead to overestimation of the correlation between poverty reduction and growth due to measurement errors in surveys, which are passed onto both the mean and the poverty measures. Ravallion (2001) tries to correct for this

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[1]   For overviews of this topic see Ravallion (1994), Deaton (1997, Chapter 3) and Slesnick (1998).

bias by using the growth rate from the national accounts as an instrumental variable for the growth rate in the survey mean. This assumes that the growth rates from the two sources are correlated, but that their errors are not correlated.

While growth rates from these two data sources tend to be highly correlated, there are some worryingly large differences for some countries (including India in the 1990s) and regions (such as Eastern Europe and Central Asia in the 1990s). Discrepancies in levels and growth rates from these two data sources can stem from various factors; for further discussion see Ravallion (2003a) and Deaton (2004). However, such discrepancies do not imply that poverty measures should instead be based on the mean incomes from the national accounts; indeed, this could well make matters worse since there is no good reason for thinking that the discrepancy between the two data sources is distribution neutral (Ravallion, 2003b; Korinek et al., 2004; Deaton, 2004).

Is growth typically pro-poor?

A common empirical finding in the recent literature is that changes in inequality at the country level have virtually zero correlation with rates of economic growth; see, for example, Ravallion and Chen (1997), Ravallion (2001), Dollar and Kraay (2002). Amongst growing economies, inequality tends to fall about as often as it rises, i.e., growth tends to be distribution neutral on average. For example, across 117 spells between successive household surveys for 47 developing countries I find a correlation coefficient of only 0.06 between annualized changes in the Gini index and annualized rates of growth in mean household income or consumption as estimated from the same surveys (Ravallion, 2003b). Thus economic growth is not typically "pro-poor" by Definition 1.

One must be careful in interpreting such evidence from at least four points of view. Firstly, there is likely to be considerable measurement error in the changes in inequality over

time — weakening the power of such tests for detecting the true relationship. Secondly, an inequality index such as the Gini index may not reflect well how changes in distribution have impacted on poverty — that depends on precisely how the distributional changes occur. In theory it is possible for the Gini index to increase while the percentage of people living below the poverty line remains the same; this appears to be rare in practice however. Thirdly, finding that there is no change in overall inequality can be consistent with considerable "churning" under the surface, with gainers and losers at all levels of living. Fourthly, an unchanging Gini index with growth can mean large increases in <u>absolute</u> income disparities. On the same data set, Ravallion (2003b) finds a strong positive correlation coefficient of 0.64 between annualized changes in the absolute Gini index (in which absolute differences in incomes are not scaled by the current mean) and rates of growth in mean household consumption. Growth in average income tends to come with higher <u>absolute</u> disparities in incomes between the "rich" and the "poor." Arguably, it is the absolute changes that are more obvious to people living in a growing developing economy than the proportionate changes. So it may well be the case that much of the debate about what is happening to inequality in the world is actually a debate about the meaning of "inequality" (Ravallion, 2003b).

While recognizing these caveats, the fact that growth tends to be distribution neutral on average makes it unsurprising that the literature has also found that absolute poverty measures tend to fall with growth; see, for example, World Bank (1990, 2000), Ravallion (1995), Ravallion and Chen (1997), Fields (2001) and Kraay (2003). The elasticity of the "$/day" poverty rate to growth in the survey mean is around –2, though somewhat lower (in absolute value) if one measures growth rates from national accounts (Ravallion, 2001). The significant negative correlation between poverty reduction and growth in the mean from surveys is found to

be robust to correcting for the likely correlation of measurement errors in the poverty measures and those in the mean, using growth rate in the national accounts as the instrumental variable (Ravallion, 2001). So economic growth is typically "pro-poor growth," by the Definition 2.

The same conclusion has found support in a number of country-level studies indicating that during spells of poverty reduction the growth component of the Datt-Ravallion decomposition dominates the redistribution component. This was first revealed in a study of poverty and growth in Indonesia in the 1980s (Ravallion and Huppi, 1991) and has subsequently been confirmed in a number of other countries (Kraay, 2003). However, we must be very careful in drawing policy implications from this finding. In particular, finding that the growth component has dominated does not imply that policy makers aiming to fight poverty can safely focus on growth alone. All this empirical finding tells us is that there was little effective redistribution in favor of the poor. It does not tell us that there is no potential for pro-poor redistribution. That would have to be argued on the basis of very different information, including information on the policy instruments available (given our information), the incentive effects of redistribution and administrative costs.

There is wide variation in the impact of a given rate of growth on poverty. Across a cross-country panel of spells constructed between successive surveys, the 95% confidence interval implies that a 2% annual growth rate in average household income will bring anything from a modest drop in the poverty rate of 1% to a more dramatic 7% annual decline (Ravallion, 2001). (So for a country with a headcount index of 40%, we have 95% confidence that the index will fall by somewhere between 0.4 percentage points and 2.8 points in the first year.) The elasticity tends to be higher (in absolute value) for higher-order poverty measures that reflect

distribution below the poverty line. Thus the gains to the poor from growth are clearly not confined to people near the poverty line, but reach deeper.

Finding that growth tends to be distribution neutral on average does not, of course, mean that distribution is unchanging. Whether inequality is rising or not can make a big difference to the rate of poverty reduction. Amongst growing economies, the median rate of decline in the "$1/day" headcount index is 10% per year amongst countries that combined growth with falling inequality, while it is only 1% per year for those countries for which growth came with rising inequality (Ravallion, 2001). Either way poverty tends to fall, but at very different rates. (And similarly amongst contracting economies; poverty rises on average, but much more rapidly when inequality is rising than falling.) As one would expect, changes in distribution matter even more for higher-order poverty measures, such as the Watts index, which can respond quite elastically to even small changes in overall inequality.

Given that growth is roughly distribution-neutral on average, it is not surprising that growth in the developing world as a whole has brought down overall poverty measures. Indeed, there has been a trend decline in the incidence of absolute poverty and the total number of poor over the bulk of the 1980s and 1990s. For example, the number of poor (by the $1/day standard) fell by about 100 million in the 1990s, representing a decline of about 0.7 points per year (Chen and Ravallion, 2004). In the aggregate, if the rate of absolute poverty reduction experienced in the 1990s is maintained it will be sufficient to achieve the U.N.'s Millennium Development Goal of halving the 1990 $1/day poverty rate by 2015. However, progress has been highly uneven. Under the current trends only two regions, East Asia and South Asia, will reach this goal. Sub-Saharan Africa, in particular, is not on track for meeting this goal. Growth in the most populous countries (China and India) has clearly been important to bringing down the global headcount of

poverty. By the same token, lack of growth in some of the poorest countries has dampened overall progress.

The story on relative poverty is not so clear. By the Chen-Ravallion relative poverty measure, the incidence of relative poverty has been falling in the 1990s though with a rising number of relatively poor (Chen and Ravallion, 2001). Higher rates of growth would be needed to bring down relative poverty.

It is instructive to have a closer look at the growth process in the two most populous countries, China and India. Table 1 gives the ordinary rate of growth in mean household consumption per capita (measured from national sample surveys) for these two countries in the 1990s, and compares this to the rate of pro-poor growth, calculated as the mean growth rate of the poor at the beginning of the period.[2] In both cases there has been a distributional shift against the poor, such that the rate of pro-poor growth is appreciably lower than the ordinary rate of growth. (Coincidentally, the distributional correction needed to obtain the rate of pro-poor growth from the ordinary rate of growth is identical at 0.63.) Notice however that the rate of pro-poor growth is still positive in both cases — indicating that absolute poverty is falling. Note also that the rate of pro-poor growth is almost five times higher in China.

Figure 1 gives the growth incidence curves for the two countries. For China, the growth rates tend to rise as we move up the distribution; the annual rate of growth in the 1990s varies from about 3% for the poorest percentile to nine percent for the richest. For India, there is a U shaped pattern, with the lowest growth rate around the third decile from the bottom, though (as

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[2] The results for India are clouded by a serious comparability problem between the consumption numbers reported by India's National Sample Survey Organization (NSSO) for 1993/94 and 1999/00; Datt and Ravallion (2002) review the issues. I have relied on comparable distributions constructed from these surveys by Sundaram and Tendulkar (2003a,b). Using the non-comparable distributions from the NSSO one finds a quite different GIC, with a rate of pro-poor growth about twice as high as from the Sundaram-Tendulkar distributions and a pro-poor distributional component.

we find for China) the growth rate peaks at the high end of the distribution. However, no matter where one draws the poverty line, the rate of pro-poor growth is positive in both cases, and higher in China. Indeed, even the poorest percentile in China enjoyed a growth rate more than double that of the poorest percentile in India.

As can be seen from Figure 2, the GIC for China changed dramatically in the 1993-96, taking on an inverted U shape, with highest growth rates observed at around the 25th percentile. The rate of pro-poor growth for this sub-period is 10.0% per annum — above the ordinary growth rate of 8.2%. The rate of pro-poor growth was far higher in this sub-period, and the distributional shifts were more pro-poor. Ravallion and Chen (2004) argue that the main reason for this change was a sharp reduction in the taxation of farmers, associated with a rise in the procurement price of foodgrains.

To give another example of the incidence of growth, consider Indonesia's crisis in 1998 and the subsequent recovery. Figure 3a gives the growth incidence curve for Indonesia over the period 1996-98, which embraced the financial and political crisis, while Figure 3b gives the curve for recovery, which had been largely complete (at least in terms of living standards) by 2002. We see in Figure 3a that average real consumption per person fell by about 12% in the crisis period, but that the incidence of this contraction was "pro-poor", in that the proportionate impact was higher (in absolute terms) at higher level of consumption (rising from slightly over 9% for the poorest to 14% for the richest). By Definition 1, this was a "pro-poor" crisis. By Definition 2 it was certainly not pro-poor. Figure 3b gives the GIC for the recovery. This was clearly pro-poor by the second definition. It was also pro-poor by the first definition for the poorest half of the population. Table 2 gives the rates of pro-poor growth, using both 1996 and 1998 as the base.

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What makes growth more pro-poor?

The rate of growth is clearly an important determinant of the rate of absolute poverty reduction. But why do we find that the same rate of growth can bring such different rates of poverty reduction? By probing more deeply into the causes of diverse impacts of growth on poverty, the literature has pointed to implications for the policies that are needed for rapid poverty reduction, in addition to promoting higher growth. Two sets of factors can be identified as the main proximate causes of the differing rates of poverty reduction at given rates of growth: the initial level of inequality and how inequality changes over time.

Initial inequality. While the evidence suggests that one cannot expect absolute poverty to fall without positive growth, the higher the initial inequality in a country (even if it does not change over time), the less the gains from growth tend to be shared by the poor. In other words, a smaller initial share tends to mean a smaller subsequent share of the gains from aggregate economic expansion. Evidence for this interaction effect between initial inequality and growth has been found in cross-country comparisons of rates of poverty reduction (Ravallion, 1997, 2001; Kraay, 2003).

The argument works in reverse too; high inequality will help protect the poor from the adverse impact of aggregate economic contraction (Ravallion, 1997). Low inequality can thus be a mixed blessing for poor people living in an unstable macroeconomic environment; it helps them share in the benefits of growth, but it also exposes them to the costs of contraction.

A parsimonious empirical model of the relationship between poverty and growth says that the rate of poverty reduction (measured as the difference in the log of the measure of poverty) is directly proportional to the "distribution corrected rate of growth" where the latter is given by the ordinary rate of growth (log difference in mean consumption or income) times a

distributional term. In Ravallion (1997) the distributional correction used is one minus the initial

Gini index. This model can be improved (in terms of fit with data on actual spells of changes in

poverty matched with growth) by using instead an adjustment for nonlinearity in the relationship

between the growth elasticity of poverty and the initial inequality, giving a simple model of the

expected rate of poverty reduction over any period:

$$\textit{Rate of poverty reduction} =$$
$$[\textit{Constant} \times (1\text{-}\textit{Inequality index})^{\theta}] \times \textit{Ordinary growth rate}$$

The constant term is negative and θ is a parameter not less than one. The growth elasticity of

poverty reduction is the term in square brackets. At very high levels of inequality the poor will

gain little or nothing from economic growth; at the extreme in which inequality is at its

maximum (an inequality index of one) the richest person has all the income and so all the gains

from growth will go to that person. For values of θ strictly greater than one, higher levels of

initial inequality will have progressively smaller impacts on the elasticity as inequality rises.

Quite a good fit with data on actual rates of poverty reduction, as measured between

household surveys, can be obtained using the initial Gini index as the measure of inequality and

using $\theta = 3$.[3] By this simple model, the rate of poverty reduction in a given time period is

directly proportional to $(1\text{-}G)^3$ times the rate of growth over that period, where G is the Gini

index at the beginning of the time period. Using a sample of estimates of the changes in the log

of the "$1/day" poverty rates for the longest available spells between successive surveys for 62

countries the constant of proportionality is –9.33, with a standard error of 0.75 and $R^2 = 0.71$.[4]

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[3]   The nonlinear least squares estimate of θ on a sample of estimates of the changes in the log of
the "$1/day" poverty rates for the longest available spells between surveys for 62 countries gave 3.031
with a standard error of 0.491.

[4]   If one simply regresses the rate of poverty reduction on the rate of growth (both as log
differences) then one obtains $R^2 = 0.56$. Thus incorporating the nonlinear interaction effect with initial
inequality adds 15 percentage points to the variance in rates of poverty reduction that can be explained by
rates of growth. The "long spells" series was possible for 70 countries, but eight were dropped on the

Figure 4 plots the implied growth elasticity of poverty against the Gini index; the elasticity ranges from –4.3 to –0.6.

To help interpret this model, consider the rate of poverty reduction with a 2% rate of growth in per capita income (roughly the mean rate for the developing world 1980-2000) with no change in distribution and a headcount index of 40% (the mean poverty rate for the developing world around 1980). In a low-inequality country, with a Gini index of 0.30, say, the headcount index will fall by 6.4% per year, or 2.6 percentage points in the first year; the headcount index will be halved in 10.5 years. By contrast, in a high inequality country, with a Gini index of 0.60 growing at the same rate and with the same initial headcount index, the latter will fall at an annual rate of 1.2%, representing a decline of only 0.7 percentage points in the first year; it will then take 57 years to halve the initial poverty rate. Poverty responds slowly to growth in high inequality countries; or (to put the same point slightly differently) high inequality countries will need unusually high growth rates to achieve rapid poverty reduction.

None of this is inconsistent with the findings in the literature indicating that a large share of the variance in rates of poverty reduction can be attributed to differences in ordinary rates of growth (Ravallion, 1995; Ravallion and Chen, 1997; Fields, 2001; Kraay, 2003). In a recent contribution, Kraay (2003) presents Datt-Ravallion decompositions of changes in "$1/day" poverty measures into growth and redistribution components for as many countries as possible (drawing on the World Bank's Global Poverty Monitoring Data Base: http://www.worldbank.org/research/povmonitor/). The growth component is the product of the growth rate and what can be termed a "partial elasticity of poverty to growth," or "partial

grounds that the measured rates of poverty reduction relative to rates of growth were either far too large or far too small to be believed (elasticities less than –10 or greater than 0.5). On the full sample of 70 countries, I obtained $R^2 = 0.46$ using the ordinary rate of growth versus 0.58 using the distribution corrected rate of growth, as above.

elasticity" for short.[5] Kraay finds that the variance in the growth component is largely

attributable to the growth rate, rather than the partial elasticity or its covariance with growth. For

example, he attributes 81% of the variance in the log absolute value of the growth component of

changes in the headcount index to the variance in the log absolute growth rate. (The share is

slightly higher for other measures, such as the Watts index, and when one focuses on the longest

available spells between surveys in the data.)

All this is perfectly consistent with finding that poverty is relatively unresponsive to

growth in specific countries. Kraay's results are based on averages formed from cross-country

comparisons. (A variance is an average too, namely the mean of the squared deviations from the

ordinary mean.) For a developing country with average inequality and for which inequality does

increase with growth, Kraay's results offer some support for his policy conclusion that for

reducing poverty the main thing to worry about is achieving a higher rate of growth. However,

that does not mean that growth is sufficient even when inequality is low. If growth in a low

inequality country comes with a sufficient increase in inequality then it will by-pass the poor.

And, as already noted, the empirical finding that growth is roughly distribution neutral on

average is consistent with the fact that it increases roughly half the time during spells of growth

(Ravallion, 2001). Policy effort to keep inequality low may then be crucial to pro-poor growth in

many low-inequality countries.

Furthermore, as we have seen, for high inequality countries, growth will be quite a blunt

instrument against poverty unless that growth comes with falling inequality. The heterogeneity

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[5]   It is a partial elasticity because it holds distribution constant; by contrast the "total elasticity" lets distribution vary consistently with the data; the elasticity in square brackets in the above equation is a total elasticity. The analytic elasticities of poverty measures discussed in Kakwani (1993) and Bourguignon (2001) are partial elasticities.

in country circumstances is key here. Averages formed across countries can be quite uninformative about how best to achieve pro-poor growth in specific countries.

While initial inequality is an important proximate determinant of differing rates of poverty reduction at a given rate of growth, to help inform policy we need to probe more deeply into the relevant sources of inequality. There are inequalities in a number of dimensions that are likely to matter, including access to both private (human and physical) assets and public goods. Inequalities in access to infrastructure and social services naturally make it harder for poor people to take up the opportunities afforded by aggregate economic growth.

Further research is needed on the specific factors influencing the growth elasticity of poverty reduction. Some clues as to the role played by initial conditions have been found by comparing rates of poverty reduction across states of India, for which we can compile a long series of reasonably comparable survey data back to about 1960. The analyses of these data confirm that economic growth has tended to reduce poverty in India. Higher average farm yields, higher public spending on development, higher (urban and rural) non-farm output and lower inflation were all poverty reducing (Ravallion and Datt, 2002). However, the response of poverty to non-farm output growth in India has varied significantly between states. The differences reflected systematic differences in initial conditions. Low farm productivity, low rural living standards relative to urban areas and poor basic education all inhibited the prospects of the poor participating in growth of the non-farm sector. Rural and human resource development appear to be strongly synergistic with poverty reduction through an expanding non-farm economy.

Changing income distribution. A second factor influencing the rate of poverty reduction at a given rate of growth is changing income distribution. We have seen that what happens to inequality in growing economies can make a big difference to the rate of poverty reduction.

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What underlies the changes in distribution? There are clearly a great many country-specific idiosyncratic factors (such as shocks to agricultural incomes, changes in trade regime, tax reforms, welfare-policy reforms and changes in demographics). Generalizations across country experience are never easy, but one factor that is likely to matter in many developing countries is the geographic and sectoral pattern of growth. The marked concentrations of poor people in specific regions and/or sectors that one finds in many countries points to the importance of the pattern of growth to overall poverty reduction. The extent to which growth favors the rural sector is often key to its impact on aggregate poverty. The geographic incidence of both rural and urban economic growth is often important as well. However, the extent to which the pattern of growth (rather than simply the overall growth rate) matters to the rate of poverty reduction is likely to vary from country-to-country, depending on (*inter alia*) how unbalanced the growth process has been in the past and (hence) how much difference one currently finds between sectors or regions in levels of poverty.

Higher growth in a number developing countries has come with widening regional disparities and often little or no growth in lagging poor areas. For example, non-farm economic growth in India has not occurred in the states where it would have the most impact on poverty nationally (Datt and Ravallion, 2002). This can be seen in Figure 5, which plots the non-agricultural growth rate by state (on the vertical axis) against the proportionate impact of non-agricultural growth in each state on the *national* poverty rate (the latter is given by the state's elasticity of poverty to growth weighted by its share in national poverty). For the geographic pattern of growth to be conducive to poverty reduction, one would see a negative relationship in this figure; states where poverty is more (negatively) responsive to growth would need to grow faster. But there is no sign of this. A more pro-poor geographic pattern of growth in India's

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non-agricultural economy in the 1990s would have required higher growth in states such as Bihar, Madhya Pradesh, Orissa and Uttar Pradesh.

Agricultural growth has also lagged relative to the (primarily urban) non-farm economy. Here the geographic pattern of growth has not been the issue, but rather the problem has been too little aggregate growth in this key sector for the poor. As a result, the overall growth process in India has tended to become less pro-poor over time.

Similar processes appear to have been at work in China. Ravallion and Chen (2004) find that rural economic growth in China over 1981-2001 was generally not greater in the provinces where it would have had the most impact on poverty nationally. Nor has the sectoral composition of growth been particularly pro-poor; after an initial period of highly pro-poor growth in the early 1980s (fuelled by policy reforms that established a relatively equitable allocation of land-use rights locally and gave farmers the incentives to produce) the growth process switched to sectors with less impact on aggregate poverty.

Making growth more pro-poor requires a combination of more growth, a more pro-poor pattern of growth and success in reducing the antecedent inequalities that limit the prospects for poor people to share in the opportunities unleashed in a growing economy. The ideal combination will naturally vary with country circumstances. In some countries, attention can safely focus on the overall rate of growth to assure rapid poverty reduction; elsewhere, a broader approach will be called for. This begs the question as to whether there might be a trade-off between interventions to make growth more pro-poor and the rate of growth.

Is poverty an impediment to future growth?

While poverty is more often seen as a consequence of low average income, there are reasons for thinking that there is a feedback effect whereby high inequality also impedes future

growth.[6] In many developing countries, a plausible way this can happen stems from credit

market failures, which mean that some people are unable to exploit growth-promoting

opportunities for investment. And it will tend to be the poor for whom these constraints are most

likely to be binding. With declining marginal products of capital, the output loss from the

market failure will be greater for the poor. So the higher the proportion of poor people there are

in the economy the lower the rate of growth. Then poverty is self-perpetuating.

There are other ways in which initial distribution matters to growth prospects. In the

presence of capital market failures due to moral hazard, high inequality can dull incentives for

wealth accumulation. It has also been argued that high inequality can foster macroeconomic

instability and impede efficiency-promoting reforms that require cooperation and trust.[7]

There is supportive evidence for the view that inequality is bad for growth from cross-

country comparisons of growth rates, suggesting that countries with higher initial inequality

experienced lower rates of growth controlling for other factors such as initial average income,

openness to trade and the rate of inflation.[8]   At the same time, there are also a number of

concerns about the data and methods underlying these findings based on cross-country

comparative analysis (Ravallion, 2001). Future research will hopefully throw more light on the

magnitude of the efficiency costs of inequality.

It is instructive to consider again the case of China. It is clear that both mean income and

inequality in China have risen substantially over the last two decades of the twentieth century.

This is consistent with the idea of an aggregate trade off. However, a closer inspection of the

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[6]   There is now a sizeable theoretical literature on the various ways in which inequality can impede growth. Contributions include Galor and Zeira (1993), Banerjee and Newman (1993), Benabou (1996), Aghion et al., (1999) and Bardhan et al., (1999).

[7]   Aghion et al (1998) and Bardhan et al. (1999) review these and related arguments as to why high inequality can reduce aggregate output.

[8]   See Persson and Tabellini (1994), Alesina and Rodrik (1994), Clarke (1995), Birdsall et al., (1995), Perotti (1996), Deininger and Squire (1998) and Easterly (2002).

data casts doubt on that view (Ravallion and Chen, 2004). The time periods when inequality fell (notably the early 1980s and the mid-1990s) actually had the highest growth rates, not the lowest. And the provinces where rural inequality rose the least had the highest growth rates.

Accepting that there is no aggregate trade off between mean income and inequality does not, however, mean that there are no trade-offs at the level of specific policies. Reducing inequality by adding further distortions to an economy will have ambiguous effects on growth and (hence) poverty reduction.

However, there are many things that governments can do to assure more pro-poor growth. A high priority must be given to public action that can help poor people acquire the skills and maintain the good health needed to participate in the growth process. Policies that help insure the poor can also help underpin their longer-term prospects of escaping poverty. Doing less damage is also a good idea. There are often biases against the poor in taxation and spending policies, such as in the allocation of infrastructure spending. Government policies in some countries also add to the risks and costs facing poor people in attempting to escape poverty, such as by migration to better off areas. The longstanding idea of an aggregate insurance-efficiency trade off in poor countries is equally questionable. Arguably lack of insurance is also a cause of longer-term poverty and there is supportive evidence for this view from a number of micro empirical studies (reviewed in Ravallion, 2004). Social protection policies may thus have a bigger role in assuring pro-poor growth than they have been given in the past.

The task of making growth more pro-poor (meaning more poverty reducing) entails some combination of higher growth and a more pro-poor distribution of the gains from growth. Both factors are in turn influenced by initial conditions, institutions and policies in specific country settings. While there may well be trade offs between the things that are good for growth

and good for distribution, it should not be presumed that this will always be the case. Some of the factors that impede growth also entail that the poor share less in the opportunities unleashed by growth. Recognizing that it is typically the poor rather than the rich who are locked out of profitable opportunities for self-advancement, well-designed direct public action against current poverty can also help promote growth and hence longer-term poverty reduction.

Conclusions

The challenge for policy is to combine growth-promoting policies with the right policies to assure that the poor can participate fully in the opportunities unleashed, and so contribute to that growth. If a country gets the combination of policies right then both growth and poverty reduction can be rapid. Get it wrong, both may well be stalled. Future research can help meet this challenge by:

- Throwing light on the country-specific and sub-national factors that influence the distributional nature of aggregate growth.
- Identifying to what extent those factors are amenable to policy intervention.
- Quantifying the trade-offs between alternative policies for promoting pro-poor growth, embracing both redistributive social policies and alternative growth strategies.

Appendix: Measuring pro-poor growth

The Watts index is arguably the single best measure of poverty, since it is the only index that satisfies all the properties of an ideal poverty measure, as identified in the theoretical literature (Zheng, 1993). What then is the measure of the rate of "pro-poor growth" corresponding to changes over time in the Watts index? It turns out that the answer is strikingly simple.

Ravallion and Chen (2003) propose using the mean growth rate of the poor. To see why this measure is of interest, note first that the Watts index at date t can be written in the form:

$$W_t = \int_0^{H_t} \log[z / y_t(p)]dp \tag{1}$$

where $y_t(p)$ is the quantile function (obtained by inverting the cumulative distribution function $p = F_t(x)$ at the p'th quantile) and $H_t = F_t(z)$ is the headcount index. It is readily verified that (1) can be written in the equivalent form:

$$W_t = \log(z / y_t^*) \tag{2}$$

where

$$\log y_t^* \equiv \int_0^{H_t} \log y_t(p)dp + (1 - H_t)\log z \tag{3}$$

is the mean of log censored incomes, where the censored income is $\min[y_t(p), z]$, i.e., actual income when this is below the poverty line and the poverty line itself otherwise. It is evident from (2) that y_t^* is a stable monotonic decreasing function of the actual value of the Watts index. In other words, y_t^* is an exact money metric of the Watts index.

The growth rate in y_t^* is the aggregate growth rate in the incomes of the poor. On differentiating (3) w.r.t. time we have:

$$\frac{d\log(y_t^*)}{dt} = -\frac{dW_t}{dt} = \int_0^{H_t} \frac{d\log y_t(p)}{dt}dp \tag{4}$$

This can be interpreted as the measure of the growth rate consistent with the Watts index for the level of poverty. The growth incidence curve is simply:

$$g_t(p) \equiv \frac{d \log y_t(p)}{dt} \quad \text{for } 0 \le p \le 1 \tag{5}$$

This traces out how the growth rate varies by percentile of the distribution ranked by *y*. Thus the change in the Watts index per unit time is simply the area under the growth incidence curve up to the head count index. When equation (4) is normalized by the headcount index one obtains the mean growth rate of the poor:

$$g_t^p \equiv \frac{1}{H_t} \int_0^{H_t} g_t(p) \tag{6}$$

Notice that when all income levels grow at the same rate (leaving distribution unchanged), equation (6) just gives the overall growth rate, γ_t. Notice also that the change in the Watts index when all income grow at the same rate is:

$$-\frac{dW_t^*}{dt} \equiv \gamma_t H_t \tag{7}$$

Thus one can also write the rate of pro-poor growth, as given by (6), in the equivalent form:

$$g_t^p \equiv \frac{dW_t}{dW_t^*} \gamma_t \tag{8}$$

Thus the rate of pro-poor growth is the ordinary growth rate in the mean scaled up or down by the ratio of the actual change in the Watts index to the change implied by distribution-neutral growth (Ravallion and Chen, 2003).

References

Aghion, Philippe, Caroli, Eva and Garcia-Penalosa, Cecilia (1999), 'Inequality and Economic Growth: The Perspectives of the New Growth Theories', *Journal of Economic Literature*, 37(4), 1615-1660.

Alesina, Alberto and Rodrik, Dani (1994), 'Distributive Politics and Economic Growth', *Quarterly Journal of Economics*, 108, 465-90.

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

Banerjee, Abhijit V., and Andrew F. Newman, (1993), 'Occupational Choice and the Process of Development,' *Journal of Political Economy* 101(2): 274-298.

Bardhan, Pranab, Samuel Bowles and Herbert Gintis (1999), 'Wealth Inequality, Wealth Constraints and Economic Performance,' in A.B. Atkinson and F. Bourguignon (eds) *Handbook of Income Distribution*, vol. I., Amsterdam: North-Holland.

Baulch, Robert and Neil McCulloch (2000), 'Tracking pro-poor growth.' ID21 insights No. 31. Sussex: Institute of Development Studies

Benabou, Roland (1996), 'Inequality and Growth', in Ben Bernanke and Julio Rotemberg (eds), *National Bureau of Economic Research Macroeconomics Annual*, Cambridge: MIT Press, pp.11-74.

Birdsall, Nancy, Ross, D. and Sabot, R. (1995), 'Inequality and Growth Reconsidered: Lessons from East Asia', *World Bank Economic Review*, 9(3), 477-508.

Bourguignon, Francois (2001), 'The Pace of Economic Growth and Poverty Reduction.' Paper presented at LACEA 2001 Conference.

Chen, Shaohua and Ravallion, Martin (2001), 'How Did the World's Poorest Fare in the 1990s?', *Review of Income and Wealth*, 47, 283-300.

_____ and _____ (2004), 'International Poverty Measures for the Developing World, 1981-2001,' Development Research Group, World Bank.

Clarke, George R.G., (1995), 'More Evidence on Income Distribution and Growth', *Journal of Development Economics*, 47, 403-428.

Datt, Gaurav and Ravallion, Martin (1992), 'Growth and Redistribution Components of Changes in Poverty Measures: A Decomposition with Applications to Brazil and India in the 1980s', *Journal of Development Economics*, 38, 275-295.

_____ and _____ (2002), 'Has India's Post-Reform Economic Growth Left the

Poor Behind', *Journal of Economic Perspectives*, 16(3), 89-108.

Deaton, Angus (1997), *The Analysis of Household Surveys*, Johns Hopkins University Press for the World Bank.

_____ (2004), 'Measuring Poverty in a Growing World (or Measuring Growth in a Poor World,' *Review of Economics and Statistics*, forthcoming.

Deininger, Klaus and Squire, Lyn (1998), 'New Ways of Looking at Old Issues: Inequality and Growth', *Journal of Development Economics*, 57(2), 259-87.

Dollar, David and Aart Kraay, (2002), 'Growth is Good for the Poor,' *Journal of Economic Growth*, 7(3): 195-225.

Easterly, William (2002), 'Inequality does Cause Underdevelopment: New Evidence,' Working Paper 1, Center for Global Development, Washington DC.

Fields, Gary S., (2001), *Distribution and Development*. New York: Russell Sage Foundation.

Foster, James., J. Greer, and E. Thorbecke, (1984), "A Class of Decomposable Poverty Measures", *Econometrica* 52: 761-765.

Galor, Oded and Joseph Zeira (1993), 'Income Distribution and Macroeconomics,' *Review of Economic Studies* 60(1), 35-52.

Kakwani, Nanak (1993), 'Poverty and Economic Growth with Application to Côte D'Ivoire,' *Review of Income and Wealth,* 39, 121-139.

Kakwani, Nanak and E. Pernia, (2000), 'What Is Pro-Poor Growth?' *Asian Development Review.* 18(1): 1-16.

Korinek, Anton, Johan A. Mistiaen and Martin Ravallion, (2004), 'Survey Nonresponse and the Distribution of Income,' Development Research Group, World Bank.

Kraay, Aart (2003), 'When is Growth Pro-Poor? Evidence from a Panel of Countries,' mimeo, Development Research Group, World Bank.

Perotti, Roberto (1996), 'Growth, Income Distribution and Democracy: What the Data Say,' *Journal of Economic Growth*, 1(2), 149-87.

Persson, Torsten and Tabellini, Guido (1994), 'Is Inequality Harmful for Growth?,' *American Economic Review*, 84, 600-621.

Ravallion, Martin (1994), *Poverty Comparisons*, Harwood Academic Publishers, Chur, Switzerland.

_____ (1995), 'Growth and Poverty: Evidence for Developing Countries in the 1980s', *Economics Letters*, 48, 411-417.

_____ (1997), 'Can High Inequality Developing Countries Escape Absolute Poverty?', *Economics Letters,* 56, 51-57.

_____ (2001), 'Growth, Inequality and Poverty: Looking Beyond Averages', *World Development*, 29(11), 1803-1815.

_____ (2003a), 'Measuring Aggregate Welfare in Developing Countries: How Well do National Accounts and Surveys Agree?,' *Review of Economics and Statistics*, 85, 645-652.

_____ (2003b), 'The Debate on Globalization, Poverty and Inequality: Why Measurement Matters', *International Affairs*, 79(4), 739-754.

_____ (2004), 'Transfers and Safety Nets in Poor Countries: Revisiting the Trade-Offs and Policy Options,' in Abhijit Banerjee, Roland Benabou and Dilip Mookerjee (eds), *Poverty and Development*, Oxford University Press, forthcoming.

Ravallion, Martin and Monika Huppi (1991), 'Measuring Changes in Poverty: A Methodological Case Study of Indonesia During and Adjustment Period', *World Bank Economic Review*, 5, 57-82.

Ravallion, Martin and Chen, Shaohua (1997), 'What Can New Survey Data Tell Us about Recent Changes in Distribution and Poverty?', *World Bank Economic Review*, 11(2), 357-82.

_____and _____ (2003), 'Measuring Pro-Poor Growth,' *Economics Letters*, 78(1), 93-99.

_____and _____ (2004), 'China's (Uneven) progress Against Poverty,' Policy Research Working Paper 3408, World Bank.

Ravallion, Martin and Datt, Gaurav (2002), 'Why Has Economic Growth Been More Pro-Poor in Some States of India than Others?', *Journal of Development Economics*, 68, 381-400.

Slesnick, Daniel T. (1998), 'Empirical Approaches to the Measurement of Welfare,' *Journal of Economic Literature*, 36(4), 2108-65.

Sundaram, K., and Suresh D. Tendulkar (2003a), 'Poverty in India in the 1990s: An Analysis of Changes in 15 Major States," *Economic and Political Weekly*, Vol. 38 (August 2), 1385-93.

_____, and _____ (2003b), 'Poverty in India in the 1990s: Revised Results for All-India and 15 Major States for 1993-94," *Economic and Political Weekly*, Vol. 38 (November 15), pp. 4865-73.

Watts, Harold W. (1968), 'An Economic Definition of Poverty,' in Daniel P. Moynihan (ed.), *On Understanding Poverty*, New York, Basic Books.

World Bank (1990), *World Development Report: Poverty*, New York: Oxford University Press.

World Bank (2000), *World Development Report: Attacking Poverty*, New York: Oxford University Press.

Zheng, Buhong, (1993), 'An Axiomatic Characterization of the Watts Index,' *Economics Letters.* 42, 81-86.

Table 1: Ordinary rates of growth and rate of pro-poor growth in China and India

| Growth rates (% per annum)	India 1993/94-1999/00	China 1990-1999
Ordinary growth rate	1.3	6.2
Rate of pro-poor growth	0.8	3.9
Distributional effect	0.63	0.63

Note: Based on a headcount index of 40% for India and 15% for China. The China estimates are for household income per person and are from Ravallion and Chen (2003). The India estimates use comparable distributions of consumption per person based on a common "mixed reference period" for categories of consumption as obtained by Sundaram and Tendulkar (2003b). (These correct a mistake in the 1993/94 distributions as reported in Sundaram and Tendulkar, 2003a.) Rural and urban distributions are aggregated assuming urban-rural cost-of-living differentials of 33% and 38% for 1993/94 and 1999/00 respectively; these are based on updated poverty lines as used in Ravallion and Datt (2002).

Table 2: Rates of pro-poor growth in Indonesia

|	Crisis (1996-98)	Recovery (1998-02)
Ordinary growth rate	-11.9	10.1
Rate of pro-poor growth 1996 base (H=10%)	-9.7	10.3
Distributional effect	0.82	1.02
Rate of pro-poor growth 1998 base (H=31%)	-10.1	10.0
Distributional effect	0.85	0.99

Note: Author's calculations from Indonesia's Socioeconomic Survey (SUSENAS) for each year. Official Consumer price Index used as the deflator.

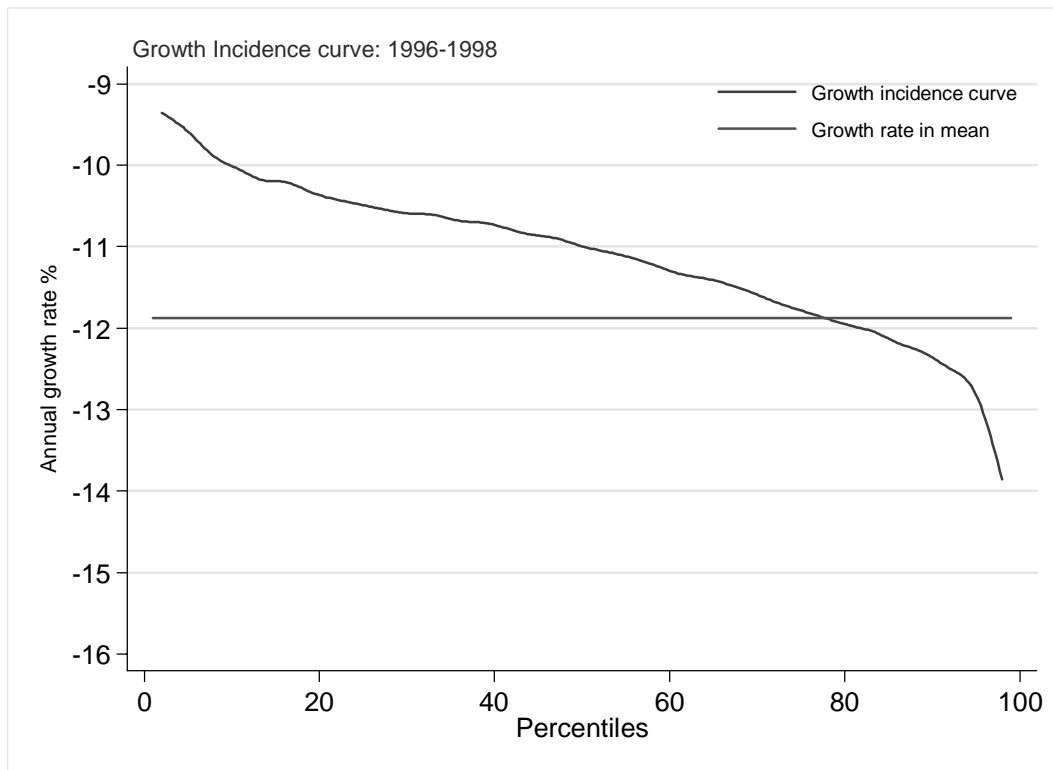**Figure 1: Growth incidence curves for China and India in the 1990s**
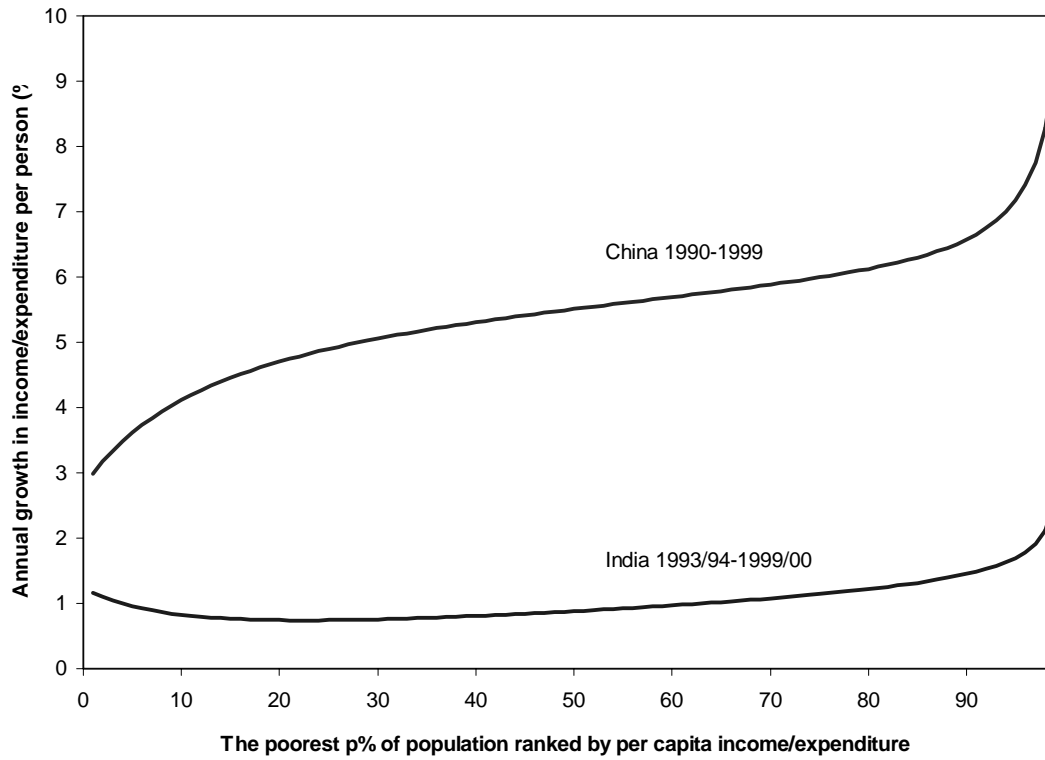
Note: See Table 1 on sources.

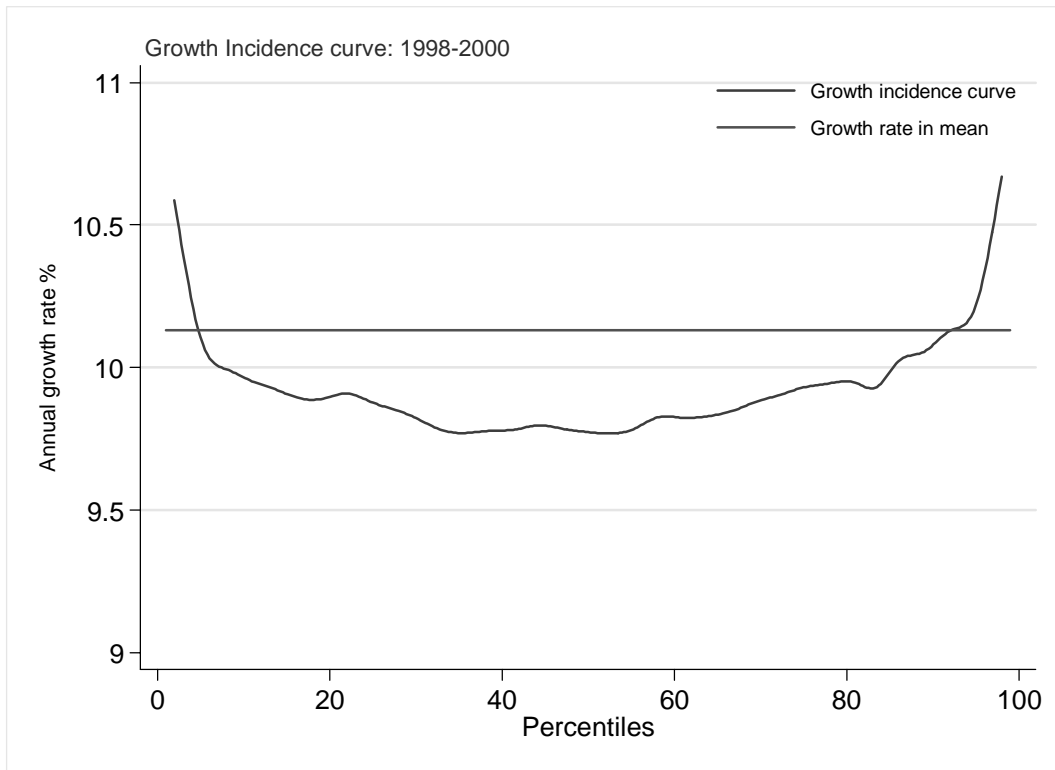**Figure 2: Growth incidence curve for China, 1993-1996**
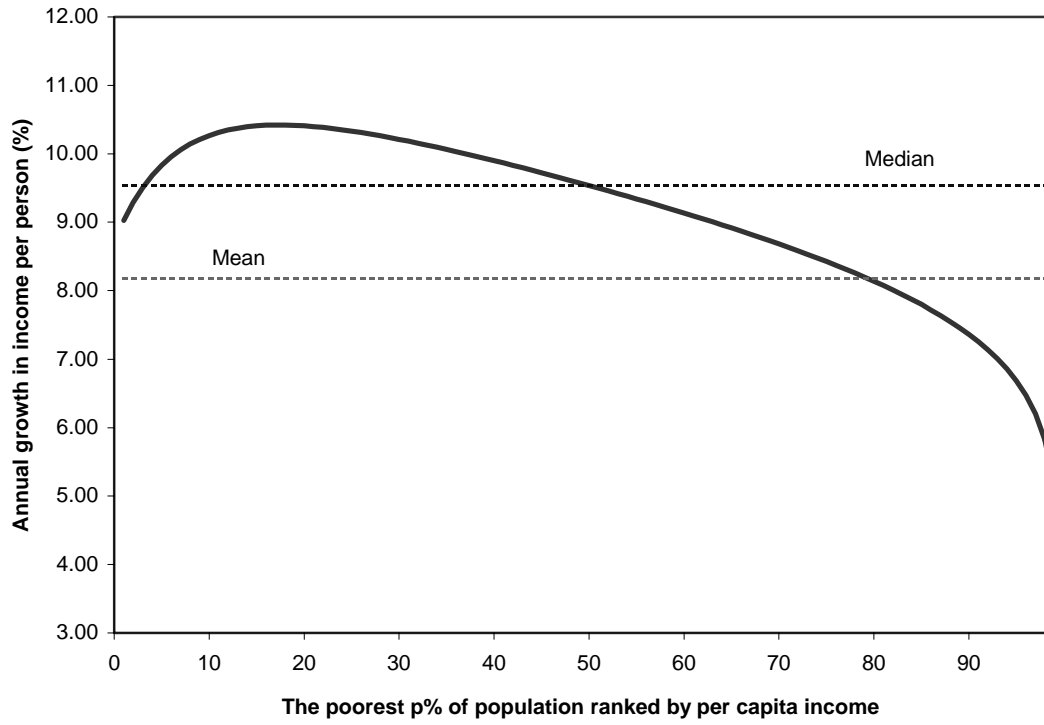
Note: See Table 1 on sources.

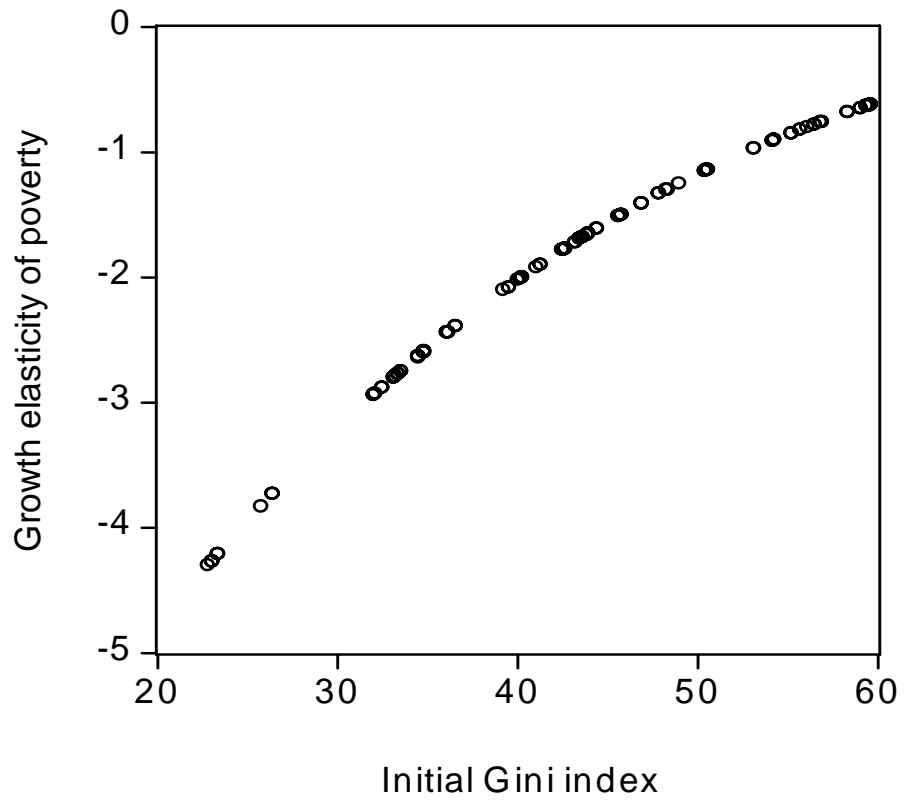**Figure 3a: Growth incidence curve for Indonesia: Crisis period**

Growth Incidence curve: 1996-1998

Note: See Table 2 on sources.

Figure 3b: Growth incidence curve for Indonesia: Recovery period
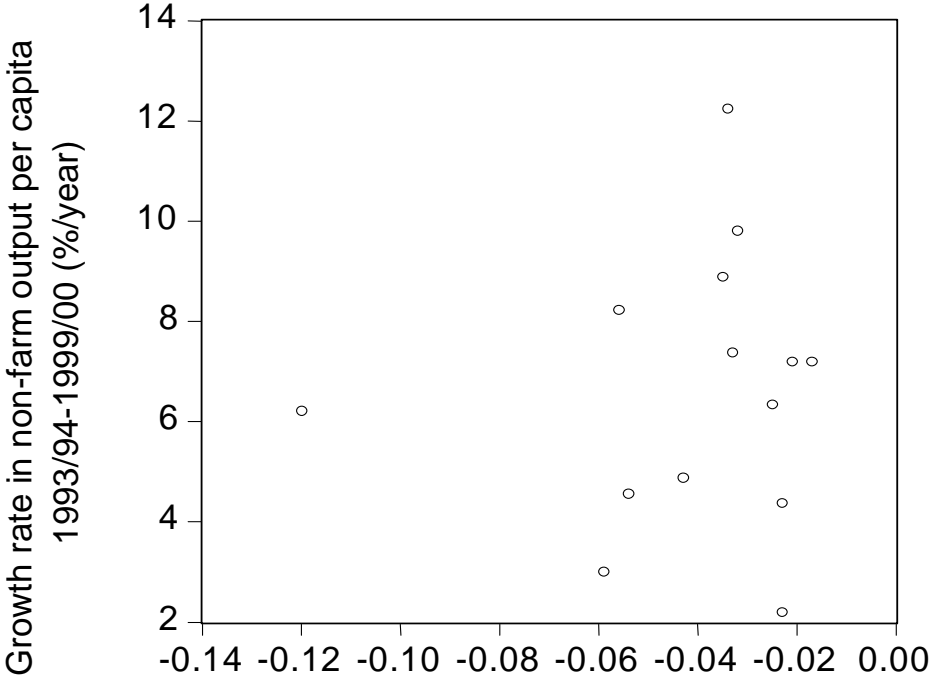
Growth Incidence curve: 1998-2000

Note: See Table 2 on sources.

Figure 4: Growth elasticity of poverty as a function of the initial Gini index

Note: Authors calculations (see text)

Figure 5: Non-agricultural economic growth in India in the 1990s has not been happening in the states where it would have had the most impact on poverty nationally

Note: Based on Datt and Ravallion (2002).