How did the world's poorest fare in the 1990s?

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Drawing on 265 national sample surveys spanning 83 countries we find that there was a net decrease in the overall incidence of consumption poverty over 1987-98. But it was not enough to reduce the total number of poor by various definitions. The incidence of poverty fell in Asia and the Middle East—North Africa. It changed little in Latin America and Sub-Saharan Africa, and it rose sharply in Eastern Europe— Central Asia. We point to two main proximate causes of the disappointing rate of poverty reduction: too little economic growth in many of the poorest countries and persistent inequalities that inhibited the poor from participating in the growth that did occur.

1.   Introduction

This paper tries to assess progress in reducing consumption poverty in the developing and transition economies in 1987-98. We consider various definitions of what it means to be "poor". One definition says that someone is poor if she lives in a household with a per capita expenditure (whether in cash or kind) that is insufficient when judged by what "poverty" typically means in the world's poorest countries. This definition judges poverty by standards common in South Asia and much of Sub-Saharan Africa, no matter where one actually lives.

We also consider two broader definitions. In one, we count as poor all those who would be judged so by standards more typical of developing countries in East Asia (except China), North Africa, and poorer countries in Eastern Europe and Central Asia. In another definition, we say someone is poor if she would probably be judged so if living in the poorest countries, or if she has an unusually low consumption level relative to others in the actual country of residence.

While we try to be eclectic about the definition of consumption poverty, we recognize that there are limitations of all our definitions — limitations that we cannot do anything about with the data available. Potentially important examples are the fact that our definition of poverty does not directly reflect inequality within the household, and that differences in command over non-market goods are ignored.

Implementing even our somewhat narrow definitions is nonetheless difficult given the data available. Our assumptions in this paper closely follow those of Chen et al., (1994) and Ravallion and Chen (1997), which provide more complete descriptions of the pros and cons of the methods used. Here we focus on the differences with our past

methods, and present the main results of our up-date, drawing on new survey data and new price data for exchange rate conversions.[1] These estimates override all previous estimates from this project, in that we have re-calculated everything back in time in the light of the new data.

The next section describes country coverage of the data set we have constructed. Section 3 describes the poverty line and exchange rates, while section 4 focuses on the measures of poverty. Our main results for absolute poverty are discussed in section 5. Section 6 tests their sensitivity to using instead a measure that takes account of relative consumption when deciding who is poor. Section 7 discusses the proximate causes or our main findings, drawing on other literature. Section 8 concludes.

2.   Coverage of the data set

The first estimate under this project was for 1985 and was based on household surveys for 22 countries, with an extrapolation model used for another 64 countries (World Bank, 1990, Chapter 2; Ravallion et al., 1991). As more survey data became available, the extrapolation model was dropped in favor of the assumption that the average poverty rate for countries without distributional data equaled that for countries with such data at the regional level; Chen et al., (1994) discuss this assumption further.

The first attempt to assess progress over time was Chen et al., (1994), which provided estimates for 1985 and 1990 using data for 44 countries. The last up-date prior to this paper used data from 122 surveys for 67 countries to make estimates for 1987, 1990 and 1993 (World Bank, 1996; Ravallion and Chen, 1997). The data set then

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[1]   A web site is also in preparation that will give further details, including the individual country estimates. The latest year's estimates at country level are also published in the World Bank's *World Development Indicators* (see, for example, World Bank, 2000a).

represented 85% of the population of the developing world (by which we mean Part 2 member countries of the World Bank). The present up-date provides estimates for 1987, 1990, 1993, 1996 and 1998 using distributions from 265 national surveys from 83 countries representing 88% of the total population of the developing world.

As in the past estimates, all poverty and inequality measures are estimated from the primary (unit record or tabulated) survey data. Unlike all other compilations of distributional data that we know of, no secondary sources are used; we have not used any pre-existing estimates from other compilations or country studies. The measures of household living standards are normalized by household size. The distributions are weighted by household size and sample expansion factors (when relevant) so that a given fractile (such as the poorest decile) should have the same share of the country-specific population across the sample.[2] The data come in various forms, ranging from micro data to grouped tabulations; Chen et al. (1994) and Ravallion and Chen (1997) discuss our estimation methods for grouped data.

As in past work, we have tried to eliminate any obvious comparability problems, either by re-estimating the consumption/income aggregates or the more radical (though thankfully not common) step of dropping a survey. However, there are comparability problems that we cannot deal with; for example, it is known that differences in survey method (such as in questionnaire design) and definitions can create non-negligible differences in the estimates obtained for consumption or income. Aggregation will presumably reduce these problems but any regional differences will remain.

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[2] It is still surprisingly common to mix household fractiles and person fractiles in data sets, and it is often unclear which is which; this matters since household size is negatively correlated with consumption per person, and the size of this correlation varies from country to country.

Table 1 lists the surveys used, with their dates and welfare indicators, and population coverage. Coverage varies greatly by region, ranging from 53% of the population of the Middle East and North Africa to 98% of the population of South Asia.

Not all of the surveys available were included. We also had access to survey data for Cambodia, Croatia, Djibouti, Guinea, Guinea-Bissau, Papua New Guinea and Vietnam, but data were missing on either the purchasing power parity exchange rates of consumer price indices. (These data are discussed further in the next section.) We also had surveys for Tanzania (1993) and Ghana (1992 and 1997) but we chose not to use them because of serious comparability problems that we could not resolve satisfactorily.

3. Exchange rates and poverty lines

Past estimates used the Penn World Tables (PWT) as the source of Purchasing Power Parity (PPP) exchange rates for consumption (Ravallion et al., 1991; Chen et al., 1994; Ravallion and Chen, 1997). However, in this version of the data set we have switched to the consumption PPP estimates produced by the World Bank, both because of their availability and for consistency with other World Bank data. The Bank's 1993 PPPs are based on new price and consumption basket data collected by the 1993 International Comparison Project (ICP) which covered 110 countries. PPPs from PWT 5.6 are based on 1980s ICP data and covered only 60 countries. The two sets of PPPs are not comparable with each other even for the same year.

The international poverty line in our past work was set at $1 per day at 1985 PPP. We re-assessed this poverty line to be consistent with the 1993 PPP's. The original $1/day poverty line was chosen as being representative of the poverty lines found amongst low-income countries (Ravallion et al., 1991). The same principle was applied

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in up-dating the poverty line with the new PPPs. The equivalent line in 1993 PPP is about $1.08 a day in 1993 price ($32.74 per month); this is the median of the lowest ten poverty lines within the same set of countries used by Ravallion et al. (1991). This is the main poverty line we will focus on here, and we will simply call it the $1/day line.[3]

We also re-ran the regression model for poverty lines reported in Ravallion et al. (1991), using the new PPPs. That paper regressed the log of the country-specific poverty line on a quadratic function of consumption per capita, also at PPP; we can re-write that specification in the equivalent form:

$$\ln z_i = \boldsymbol{a} + \boldsymbol{b}(c_i - c^{\min}) + \boldsymbol{g}(c_i - c^{\min})^2 + \boldsymbol{e}_i \quad (i=1,..,n) \qquad (1)$$

where z_i is the poverty line for country i with consumption per capita c_i (with $c_i \geq c^{\min}$, the lowest consumption per capita in the sample) in a sample of n countries while $\boldsymbol{a}, \boldsymbol{b}, \boldsymbol{g}$ are parameters we include a zero mean i.i.d. error term. Notice that the intercept in (1) gives the lower bound to the log poverty line, for the poorest country in the sample.

We estimated equation (1) on the Ravallion et al., (1991) data set of poverty lines for 33 countries (though one was dropped because the 1993 PPP rate was not available). Our estimate of $\boldsymbol{a}$ was 3.46 (with a t-ratio of 40.5, based on the White standard error), representing $1.05 per day ($31.96 per month), with a 95% confidence interval of ($0.88, $1.24). (The regression coefficients on mean consumption and its squared value were 0.0040 and -1.56×10^{-6} with t-ratios of 6.54 and 2.81 respectively, and R^2=0.88.) So our $1.08 poverty line is a close approximation to the poverty line one would expect to find in the poorest country. The fact that there is such close agreement between the estimated

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[3] The original "$ per day" line was also rounded off; it was actually $31 per month (Ravallion et al., 1991). Later this was changed to $30.42 per month (Chen et al. (1994).

intercept of equation (1) and the median poverty line amongst the poorest 10 countries in this sample illustrates that the relationship is very flat amongst poor countries.

The poverty rate on this basis must thus be deemed a conservative estimate, whereby aggregate poverty in the developing world is defined by perceptions of poverty found in the poorest countries. We also give results for twice this line (to give a poverty line more typical of low-middle income countries), as well as a relative poverty line, which varies with mean consumption in the country of residence. Naturally these give higher estimates of the extent of poverty, though our main concern here is with how much impact they have on our assessment of the extent of progress in reducing poverty.

4.   Measuring absolute consumption poverty

In keeping with past work, we measure poverty in terms of household consumption expenditure per capita. Of the 265 surveys, 181 allow us to estimate the distribution of consumption expenditures; this is true of all the surveys used in the Middle East and North Africa, South Asia and Sub-Saharan Africa (Table 1). For about one quarter of the cases in which we do not have consumption distributions we do have survey-based estimates of mean consumption, in which case we replace the income mean by the consumption mean. (There is however no obvious basis for adjusting the Lorenz curve; one expects higher inequality in an income distribution than a consumption distribution for the same place and data.) When only an income distribution is available, we follow past practice of re-scaling mean income by one minus the national saving rate.[4]

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[4]   We also re-estimated the poverty measures without this assumption; our main findings on trends over time and regional comparisons are unaffected; the main quantitative effect is to decrease the poverty rate in Latin America (for which income distributions are more common than other regions) by a few percentage points. Details are available from the authors.

Having converted the international poverty line to local currency at PPP in 1993 we convert to the prices prevailing at each survey date using the country-specific official Consumer Price Index (CPI). The weights in this index may or may not accord well with consumer budget shares at the poverty line. In periods of relative price shifts, this will bias our comparisons of the incidence of poverty over time, depending on the extent of utility-compensated substitution possibilities for the people at the poverty line.

To estimate regional poverty at a given reference year (1996, say) we "line up" the surveys in time using the same method described in Chen et al., (1994) and Ravallion and Chen (1997). Within 83 countries in our data set, 17 have only one survey; 31 have two surveys and 35 have three or more surveys over the period 1980 to 1998. If there is only one survey for a country, then we estimate measures for each reference year by applying the growth rate in real private consumption per person from the national accounts to the survey mean — assuming in other words that the Lorenz curve for that country does not change.[5] When the reference date (1993 say) is between two surveys (1989 and 1995 say), we do the following. We first estimate the mean consumption at the reference year using the NA growth rate between the survey year and the reference year. Based on the example here, we have two means at the reference year based on two surveys, M93(89) and M93(95) where M93(t) is the estimated mean for 1993 using the survey for year t. Then we calculate the mean at the reference year M93 using a time weighted average of M93(89) and M93(95). Next we estimate the poverty rate at the reference year. Based on the 1989 distribution and M93, we get the H93(89). Similarly,

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[5] For some countries (Kazakhstan, Kyrgyz, Latvia, Lithuania, Moldova, Turkmenistan) the NA consumption data was incomplete. Then we used instead the GDP per capita growth rate.

based on the 1995 distribution and M93, we get H93(95). Then the poverty headcount for 1993 is the simple average of H93(89) and H93(95).

We had not originally planned making an estimate for 1998, but we wanted to see how much impact the East Asia crisis might have had. The estimate for 1998 is naturally the weakest; we only have actual 1998 surveys for China, Russia, Thailand, Belarus, Latvia, Yemen, and 1997 surveys for India, Jordan, Nigeria, Panama and Pakistan. For other countries, the calculated poverty measures assume that the distribution is unchanged, and adjust mean consumption by applying the private consumption growth rate between the latest survey date and 1998. Given the weaker coverage, we call the 1998 estimate "preliminary" (though there is a sense in which this is true of the estimates for all years, which, as in the past, we will up-date in the future as new data are obtained).

5.   Results

Table 2 gives our estimates of the headcount indices for $1.08 at 1993 PPP. Table 3 gives the results for twice this poverty line.

There are some notable differences with our previous estimates. Comparing the most recent common year (1993), we estimate a slightly lower aggregate headcount index (28.2% below $1 per day, versus 29.4% in Ravallion and Chen, 1997). But there are some notable differences in the regional composition of poverty. The estimated poverty rate for 1993 has risen sharply in Sub-Saharan Africa (49.7%, versus 39.1% in Ravallion and Chen), but fallen sharply in Latin America (15.3% versus 23.5%) and the Middle East and North Africa (1.9% versus 4.1%), with small declines in South Asia (42.4% versus 43.1%) and East Asia (25.2% versus 26.0%), and a small increase in Eastern Europe and Central Asia (4.0% versus 3.5%). While there have been many changes in

the survey data available, these changes in the estimated regional composition of aggregate poverty are largely due to the changes in PPP exchange rates.

The new estimates suggest that the aggregate poverty rate has fallen over the period, from 28.3% of the 1987 population living in households with consumption per capita below $1 per day to 24.0% in 1998. Over the longest comparable period (1987-1993) our new results suggest less progress in reducing poverty. (In Ravallion and Chen, 1997, we found that the aggregate poverty rate fell by 4% from 30.7% in 1987 to 29.4% in 1993; over the same period, we find less than a 1% decline.) This reflects the higher share of poverty attributed to Sub-Saharan Africa, where (by both sets of estimates) the poverty rate increased over the period 1987-93.

In common with past estimates, we find however that the decrease in the average poverty rate was not sufficient to reduce the aggregate number of poor, with 1.2-1.3 billion people living below $1 per day line. If we exclude China, the total number of poor has risen steadily over the period (Table 2).

We find that the trend reduction in poverty in East Asia reversed at the time of the crisis. The aggregate change is small — a 0.4 percentage point increase in the proportion of the population living under $1 per day in the region. However (in common with most other assessments of the welfare impact of such crises), this "before-after" comparison does not take account of what the poverty rate in the region would have been without the crisis. The counter-factual increase is clearly larger, given the progress prior to 1998.

To assess the counter-factual we forecast forward from the data prior to the crisis. In particular, we fit a least squares line through the data for East Asia prior to the crisis, and use this to predict what the incidence of poverty would have been in 1998 without the

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crisis. This assumes that the pre-crisis pace of poverty reduction would have been

sustainable without the crisis. We ignore any impacts on China's poor; the welfare impact

of the crisis on China was thought to be small at the time, and this is consistent with the

fact that 76% of the increase in the number of people living under $1 per day in the

region was outside China (Table 2). Fitting a linear trend to the $1 per day poverty rates

for 1987-96 for East Asia (excluding China) one obtains an estimate of 7.42% for the

headcount index in 1998 (with a standard error of 1.06).[6] Comparing this to the estimate

for 1998 in Table 2 suggests that the crisis increased the incidence of poverty in the

region (excluding China) by four percentage points, representing 22 million people —

more than twice the impact suggested by the "before-after" comparison. The aggregate

number of poor (over all regions) rose by eight million (Table 2). So this assessment of

the counter-factual suggests that we would have seen a continuing decrease in the number

of poor in the developing world after 1993 if not for the East Asia crisis.

Performing the same calculation for the $2 poverty line, the projected poverty rate

for 1998 is 39.34% (standard error of 1.36), as compared to the figure of 44.96% in Table

3. Thus the number of people living under $2 per day would have fallen by an extra 33

million without the East Asia crisis. Unlike the $1 line, this would not have been

sufficient to achieve a reduction in the aggregate number of poor in 1998, which rose by

more than 33 million when compared to 1996 (Table 3).

These calculations must be treated with some caution. For example, it should be

recalled that for many countries the 1998 estimate is a distribution-neutral extrapolation;

if distribution improved (worsened) in the crisis, these calculations will over- (under-)

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[6]   The regression line is 7.42–1.49(year–1998) with t-ratios of 7.01 and –10.26 (significant at the
2% and 1% levels respectively); the R-squared is 0.98.

estimate its impact relative to the counter-factual. There is no obvious basis for a judgement of the likely bias, from the evidence available.[7] Nor can we be sure that the pre-crisis rate of growth would have continued if there had been no crisis (though the high growth rates were not widely thought to be unsustainable at the time).

Turning to other regions, we find a trend increase in poverty in Eastern Europe and Central Asia. The number of people in this region estimated to live below the $1 per day line increased from 1 million to 24 million over this period. Over the whole period, the poverty rate has changed little in Latin America and the Caribbean, though there are signs of a small net gain to the poor in the 1990s. There is a marked fall in the incidence of poverty in the Middle East and North Africa, though most of this was in the late 1980s. There is a trend decrease in the poverty rate in South Asia, with a five percentage- point drop in the percentage of the population living under $1 per day. This was not enough to prevent rising total number of poor in this region. There was no net reduction in the poverty rate of Sub-Saharan Africa over the period.

Throughout the period, the region with the highest poverty incidence relative to the $1 per day line is Sub-Saharan Africa, followed closely by South Asia, though the ranking reverses if one uses the "$2" poverty line in Table 3. Together these two regions accounted for 68% of those living below $1 per day in 1998, up from 58% in 1987; six percentage points of this increase was in Sub-Saharan Africa, which accounted for 24% of the poor in 1998 by this measure, up from 18% in 1987.

East Asia came third in terms of the incidence of poverty initially, but its rapid reduction in poverty (up to the crisis) meant that Latin America overtook it in the mid-

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[7] World Bank (2000b) present evidence of a decrease in inequality in Indonesia during the 1998 crisis, but there was a small increase in (urban) inequality in Korea and Thailand.

1990s. Eastern Europe and Central Asia started the period as the region with the lowest poverty incidence, but by the end of the period it had overtaken Middle-East and North Africa, though this is not robust to the choice of poverty line (comparing Tables 2 and 3).

Comparing Tables 2 and 3 we see sizable differences in how much doubling the poverty line adds to the headcount index. This has bearing on the poverty impact of consumption growth. From Tables 2 and 3 we can calculate the percentage reduction in the $2 per day headcount index from a doubling of mean consumption holding the Lorenz curve constant.[8] The aggregate impact is a 57% reduction. The lowest impact is in Sub-Saharan Africa for which the $2 poverty rate falls by 39%, and the highest is Middle East and North Africa, where it falls by 91%. Between these extremes, a doubling of mean consumption reduces the $2 poverty rate by 69% in East Asia, 74% in Eastern Europe and Central Asia, 57% in Latin America, and 52% in South Asia.

Table 4 gives the poverty gap indices; these follow a similar pattern to the headcount indices.[9] The regional rankings are identical to the headcount index, but there are some differences in magnitudes. The most notable is the proportionately larger difference in the poverty gap index between Sub-Saharan Africa and South Asia; although the headcount index is only slightly higher in Africa, the poverty gap index for the $1 per day line is far higher.

Thus there is greater depth of poverty in Africa, suggesting that (unless inequality falls) it will take more growth to have the same proportionate impact on Sub-Saharan Africa's poverty gap as South Asia's, similarly to what we found for the headcount index.

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[8] This calculation uses the fact that the headcount index is homogeneous of degree zero between the mean and the poverty line, holding the Lorenz curve constant.
[9] The poverty gap index is mean distance below the poverty line where the mean is taken over the whole population, counting the non-poor as having zero poverty gap.

This is borne out by the Kakwani (1993) elasticities of the poverty gap index to distribution-neutral growth, which are –1.31 for Sub-Saharan Africa versus –3.21 in South Asia (for the $1 per day line in 1998).[10] The corresponding elasticities for other regions are –2.67 for East Asia (–3.45 excluding China), –2.29 for Eastern Europe and Central Asia, –1.93 for Latin America, –9.26 for the Middle East and North Africa (though this is deceptive, given that proportionately fewer people live below the $1 per day line in this region; using the $2 line the elasticity falls sharply, to –1.35). The overall elasticity for the developing world is –2.33. This has changed little over time (the value for 1987 is –2.28), and it has also proved quite resistant to changes in the data and assumptions (the first estimate for 1985 was –2.2; see Ravallion et al., 1991).

Poverty-gap comparisons over time are also similar to the headcount index. One noticeable difference is how much faster this index of poverty has fallen in South Asia than the headcount index; over the period 1987-98 we find a 27% drop in South Asia's poverty gap index for the $1 per day line, versus 11% for the headcount index.

6.   Allowing for low relative consumption

So far we have aimed to treat the same consumption level (at PPP) the same way no matter what country a person lives in. It has been argued that this does not capture relative deprivation, such that a poor person needs higher consumption when living in a rich country, so as to participate fully in that society.

While one might accept this point in principle, it is far from clear how exactly one should implement it empirically. A common practice in measuring poverty in OECD

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[10]   The elasticity of the poverty gap index (PG) to growth in the mean holding the Lorenz curve constant is $1–H/PG$, where H is the headcount index (Kakwani, 1993).

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countries is to use a poverty line that is half of mean income in each country (Atkinson, 1998 and Smeeding, 1997). However, this would entail counting people as not being poor in poor countries even though they fall below prevailing poverty lines in those countries. One could instead draw on the poverty measures that are actually used in the countries concerned. (World Bank, 2000a, provides a compilation from the World Bank's own poverty assessments.) However, this raises further concerns about comparability in the country-specific welfare indicators used; some countries prefer income, some consumption, for example. And the measures do not line up in time. Yet another option is to use the poverty lines actually found in country studies, but apply them to our distributional data. However, there are clearly idiosyncratic factors in these poverty lines; they are often geared to specific features of the welfare indicator used, and they are not immune from local political manipulation. A more attractive option might be to adjust the poverty line according to equation (1).[11] However, while this equation makes sense as a basis for estimating the expected poverty line in the poorest country, it is not the most obvious way one can think about setting relative poverty lines.[12]

Atkinson and Bourguignon (1999) propose an alternative approach in which the poverty line is $1/day in the poorest country but does not rise with average consumption until it reaches a critical value, after which it rises proportionately to consumption. They derive this specification by assuming that a person is deemed poor if she does not attain

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[11] In comments on Ravallion et al., (1991), the late Bela Balassa suggested that equation (1) should be used for this purpose. The suggestion was never pursued, on the grounds that the focus should remain absolute poverty in terms of consumption. Of course, if instead one defines absolute poverty in the space of utility and assumes that utility depends on both own consumption and relative consumption then it is easy to see that the consumption poverty line will rise with mean consumption (Ravallion, 1998). A similar argument can be made in the space of capabilities, following Sen (1985).

either the $1 per day consumption level (loosely interpretable as physical needs), or a given proportion of mean consumption ("social needs").

In principle one can also generate a smooth convex curve such as in equation (1) by allowing for a list of social needs, each proportional to consumption, but at different rates. Then the Atkinson-Bourguignon specification will be smoothed out, depending on how many of these needs there are. With this extension to their model one can also rationalize the type of smooth convex model in Ravallion et al (1991) and Ravallion (1998). However, the Atkinson-Bourguignon proposal offers a more intuitive and parsimonious representation of the relationship than equation (1), and fits the data quite well, with a sum of squared residuals only slightly higher than the specification in equation (1).

We chose a slightly modified version of the Atkinson-Bourguignon specification in measuring relative poverty in this section. In particular, we assume that to be deemed "not poor" a person must meet both the "$1 per day" absolute consumption standard and consume more than some proportion of the mean consumption in the country of residence. We set the constant of proportionality to avoid social exclusion at one third; this gave the best fit to the data used in setting the $1.08 poverty line.[13] The poverty line in $'s per day at 1993 PPP for any country is then given by $\max(\$1.08, c_i/3)$ where c is mean consumption per capita in 1993 at 1993 PPP.[14]

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[12] The elasticity of the poverty line to mean consumption is unbounded above using equation (1). However, unity would seem a plausible upper bound.

[13] By eye-balling the data, Atkinson and Bourguignon chose a slope of 0.37, based on the Ravallion et al., (1991) data. On the new 1993 PPP rates, a slope of one in three fits the data slightly better in terms of the sum of squared errors (based on a line search at 0.01 intervals between 0.30 and 0.50).

[14] Countries in a neighborhood of the kink (+/- 15% of $3.23 consumption per day in 1993) include Cote d'Ivoire, Gambia, Ghana, Moldova, Pakistan, Senegal, and Zimbabwe.

However, we do not change the real value of the poverty line over time in any given country. If we did, then for those countries with mean consumption above $3.24 per day, the poverty measures would then be independent of absolute levels of consumption (an depend solely on the percentile of the population for which the Lorenz curve as a slope of 1/3). Furthermore, while less poor countries tend to have higher poverty lines, it appears to be rare to observe changes (in either direction) in the real value of the poverty line in developing countries with changes in average consumption over the length of time we are considering here.

Table 5 gives the results. As one would expect the poverty rate rises sharply in East Asia (outside China), Eastern Europe and Central Asia, Latin America, and the Middle East and North Africa. The overall headcount of the poor rises to 1.6 billion. Trends over time are little affected.

The greatest proportionate impacts on the headcount index of allowing for low relative consumption are for the Middle East/North Africa and Eastern Europe/Central Asia. However, the impact on Latin America and the Caribbean is probably more notable because this region now emerges as the one with the highest incidence of poverty, with slightly over half the region's population live in poverty by this definition. The mean poverty line for Latin America is three times the $1.08 line (Table 5).[15] With this magnitude of upward adjustment to the poverty line it is not surprising that this region overtakes South Asia and Sub-Saharan Africa. Of course, as one can already guess from Table 3, much more than half of the populations of South Asia and Africa live below Latin America's mean poverty line.

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[15] We present the (population-weighted) mean poverty lines in Table 5 for expository purposes only; country-specific poverty lines were used for the calculations.

7.   Why was there not more progress against poverty?

In the aggregate, and for some large regions, all our measures suggest that the 1990s did not see much progress against consumption poverty in the developing world. Yet this was a period of aggregate economic growth; the overall rate of growth in real per capita private consumption for the low- and middle-income countries over 1990-97 was 2.6% per year (World Bank, 2000a). The elasticity of the aggregate ($1/day) poverty gap in 1987 was –2.3. Even assuming no growth from 1987 to 1990, an annual rate of growth in mean consumption of 2.6% over 1990-97 alone would have virtually halved the aggregate poverty gap, as long as overall inequality did not worsen.

What went wrong? Rising inequality was one factor. As the first paper from this project showed (Ravallion, et al., 1991), the world distribution of consumption in 1985 was such that it would not take much of an increase in overall inequality to wipe out the benefits to the world's poor of modest growth in consumption per capita. The simulations in Ravallion et al. (1991) indicated that about a four percent increase in the world's Gini index, spread over 15 years from 1985, would be sufficient to wipe out the gains to the poor from a sustained one percent per annum rate of growth in consumption per capita.[16] There is now evidence of quite sharply rising inter-personal income inequality in the world during this period; Milanovic (1999) estimates that the world Gini index increased by 5% between 1988 and 1993 (from 0.63 to 0.66). This could easily wipe out the gains to the world's poor from global economic growth.

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[16] The simulations assumed that the world Lorenz curve shifts out by an equal proportion at all points (following the assumption made by Kakwani, 1993).

Why was world inequality rising? Very few individual countries have experienced a trend increase in inequality over the longer term (a few decades, say) (Bruno et al., 1998).[17] Over shorter periods (one to five years) one finds rising inequality in about half the developing countries, though this is uncorrelated with growth rates in average household consumption per capita (Ravallion and Chen, 1997).

The more important factor in rising global inequality has been rising inequality between countries. This accounts for three-quarters of the increase in the world Gini index from 1988 to 1993 (Milanovic, 1999). The unconditional growth divergence we have seen in the 1980s and 1990s — whereby growth rates have tended to be lower in poorer countries (Pritchett, 1997) — appears to be a far more important reason for the low rate of aggregate poverty reduction than rising inequality within poor economies.

Nonetheless, even when it is not rising, inequality within countries is an important constraint on prospects for pro-poor growth. There is evidence that the same rate of growth can have very different impacts on absolute consumption poverty (Ravallion, 1997). Differences in the growth elasticities of absolute poverty appear to arise in large part from initial inequalities in incomes, education attainments and other dimensions (including geographic differences within countries). Indeed, there is evidence that initial inequality is too high in some countries to assure poverty-reducing growth even when the fundamentals are conducive to growth (Ravallion, 1997).[18]

While Sub-Saharan Africa is certainly not the only place where inequality impedes pro-poor growth, the depth of poverty (even relative to its high incidence) in that

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[17] China is one of the few cases of steadily rising inequality since the mid-1980s, though given its population weight, this is an important exception.
[18] On the role of inequalities in both non-income dimensions in inhibiting pro-poor growth see Ravallion and Datt (1999) (using data for India).

region carries a warning for the future. Africa will probably need a higher growth rate than South Asia (where the incidence of poverty is currently only slightly lower than Africa) to achieve the same rate of poverty reduction in the coming years. Yet private consumption per capita contracted in Sub-Saharan Africa over 1990-97 (at –1.2% per year, versus 2.6% growth for low and middle income countries as a whole; World Bank, 2000a).

8.   Conclusions

We have provided new estimates of the extent and depth of absolute consumption poverty in the developing world, and the incidence of relative consumption poverty, over 1987-98. In measuring absolute consumption poverty we have followed past practice in using an international poverty line that accords with an idea of "poverty" typical of the poorest countries. This gives a poverty line of about $1 per day, though we have also considered a line arbitrarily set at twice this value. In estimating the incidence of relative consumption poverty, we also count as poor people who consumed more than $1 per day but less than one third of mean consumption in their country of residence. We have drawn on new household survey and price data, and all past estimates from this project have been revised in the light of the new data.

We find that the percentage of the population of the developing world living below $1 per day in 1998 was 24%, about four points lower than 1987. Factoring in our allowance for low relative consumption brings the incidence of poverty in 1998 up to 32%, also four percentage points lower than in 1987. The total number of poor was about the same at the end of this period as the beginning. Roughly 1.2 billion people lived below $1 per day, while a further 0.4 billion consumed more than this amount, but less

than one third of the mean in their country of residence. Between 1993 and 1998 we did see a fall in the number of poor, by about 100 million; this is largely accountable to a sharp decline in the number of people consuming less than $1 per day in China.

Without the East Asia crisis, a continuation of the trend decline in poverty in East Asia would have meant a slightly lower number of people living below $1 per day in the 1998 than 1987. However, even factoring out the effect of the crisis, the number living below $2 per day rose over the period.

These aggregates hide diverse experiences over time and across regions. Only two regions saw falling numbers of consumption poor, namely East Asia (though with a reversal due to the crisis) and the Middle East and North Africa. The proportion of people living below $1 per day fell steadily in South Asia, but not enough to prevent rising numbers of poor. The proportion fell in Sub-Saharan Africa after 1993, though again not enough to prevent rising numbers of poor. The poverty rate fluctuated with no clear trend in Latin America. And it rose dramatically in Eastern Europe and Central Asia, though from a low base by the standards of what poverty means in poor developing countries.

Drawing on other literature, we have suggested two proximate causes of the low overall rate of poverty reduction in the 1990s, despite aggregate economic growth in the developing world. Firstly, too little of that economic growth was in the poorest countries. Secondly, persistent inequalities (in both income and non-income dimensions) within those countries and elsewhere prevented the poor from participating fully in the growth that did occur.

References

Atkinson, A.B., *Poverty in Europe*. Oxford: Blackwell, 1998.

Atkinson, A.B., and Bourguignon, F., Poverty and Inclusion from a World
Perspective. Paper prepared for the World Bank's ABCDE Europe
Conference, Paris, 1999.

Bruno, M., Ravallion, M., and Squire L., Equity and Growth in Developing Countries:
Old and New Perspectives on the Policy Issues, in *Income Distribution and High-
Quality Growth* (edited by Vito Tanzi and Ke-young Chu), Cambridge, Mass:
MIT Press, 1998.

Chen, S., Datt, G., and Ravallion, M., Is Poverty Increasing or Decreasing in the
Developing World?, *Review of Income and Wealth*, 40, 359-376, 1994.

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

Milanovic, B., True World Income Distribution: 1988 and 1993: First
Calculations Based on Household Surveys Alone, mimeo, World Bank,
1999.

Pritchett, L., Divergence, Big Time, *Journal of Economic Perspectives* 11, 3-17,
1997.

Ravallion, M., Can High Inequality Developing Countries Escape Absolute
Poverty? *Economics Letters* 56, 51-57, 1997.

_____, *Poverty Lines in Theory and Practice*, Living Standards
Measurement Study Working Paper 133, World Bank, Washington DC.,
1998.

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

Ravallion, M. and Datt, G., When is Growth Pro-Poor? Evidence from the Diverse
Experience of India's States", Policy Research Working Paper WPS 2263, World
Bank, 1999.

Ravallion, M., Datt, G., and van de Walle, D., Quantifying Absolute Poverty in
the Developing World", *Review of Income and Wealth* 37, 345-361, 1991.

Sen, Amartya K., *Commodities and Capabilities*, Amsterdam: North-Holland, 1985.

Smeeding, T., Poverty in Developed Countries: The Evidence from the
Luxembourg Income Study, in *Human Development Papers*, New York:
United Nations Development Programme.

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

_____, *Poverty Reduction and the World Bank: Progress and Challenges in the
Early 1990s*, Washington DC., World Bank, 1996.

_____, *World Development Indicators*, Washington DC: World Bank, 2000a.

_____, *Global Economic Prospects and the Developing Countries*, Washington
DC: World Bank, 2000b.

Table 1. Coverage of the Data Set

Region	% of 1998 population represented	Country	Survey dates	Welfare indicator
East Asia	90.8	China	1985, 1990, 1992-1998	Income
		Indonesia	1984, 1987, 1990, 1993, 1996	Expenditure
		Korea	1988, 1993	Income
		Laos	1992	Expenditure
		Malaysia	1984, 1987, 1992, 1995	Income
		Mongolia	1995	Expenditure
		Philippines	1985, 1988, 1991, 1994, 1997	Expenditure
		Thailand	1981, 1988	Income
			1988, 1992, 1996, 1998	Expenditure
Eastern Europe & Central Asia	81.7	Albania	1997	Expenditure
		Belarus	1988, 1993, 1995, 1998	Income
		Bulgaria	1989, 1992, 1994, 1995	Expenditure
		Czech Republic	1988, 1993	Income
		Estonia	1988, 1993, 1995	Income
		Hungary	1989, 1993	Income
		Kazakhstan	1988, 1993	Income
			1993, 1996	Expenditure
		Kyrgyz Republic	1988, 1993	Income
			1993, 1997	Expenditure
		Latvia	1988, 1993, 1995, 1998	Income
		Lithuania	1988, 1993, 1994, 1996	Income
		Moldova	1988, 1992	Income
		Poland	1985, 1987, 1989, 1993	Income
			1990, 1992, 1993-96	Expenditure
		Romania	1989, 1992, 1994	Income
		Russian Federation	1988, 1993	Income
			1993, 1996, 1998	Expenditure
		Slovak Republic	1988, 1992	Income
		Slovenia	1987, 1993	Income
		Turkey	1987, 1994	Expenditure
		Turkmenistan	1988, 1993	Income
		Ukraine	1988, 1992	Income
			1995, 1996	Expenditure
		Uzbekistan	1988, 1993	Income
Latin America & Caribbean	88.0	Bolivia	1990	Income
		Brazil	1985, 1988-89, 1993, 1995-96	Income
		Chile	1987, 1990, 1992, 1994	Income
		Colombia	1988, 1991, 1995-96	Income
		Costa Rica	1986, 1990, 1993, 1996	Income
		Dominican Republic	1989, 1996	Income

		Ecuador	1988, 1994-95	Expenditure
		El Salvador	1989, 1995-96	Income
		Guatemala	1987, 1989	Income
		Guyana	1993	Expenditure
		Honduras	1989-90, 1992, 1994, 1996	Income
		Jamaica	1988-90, 1993, 1996	Expenditure
		Mexico	1984, 1992	Expenditure
			1989, 1995	Income
		Nicaragua	1993	Expenditure
		Panama	1989, 1991, 1995-97	Income
		Paraguay	1990, 1995	Income
		Peru	1985, 1994, 1996	Expenditure
			1994, 1996	Income
		St. Lucia	1995	Income
		Trinidad and Tobago	1988, 1992	Income
		Uruguay	1989	Income
		Venezuela	1981, 1987, 1989, 1993, 1995-96	Income
Middle East & North Africa	52.5	Algeria	1988, 1995	Expenditure
		Egypt, Arab Rep.	1991, 1995	Expenditure
		Jordan	1987, 1992, 1997	Expenditure
		Morocco	1985, 1990	Expenditure
		Tunisia	1985, 1990	Expenditure
		Yemen	1992, 1998	Expenditure
South Asia	98.0	Bangladesh	1984-85, 1988, 1992, 1996	Expenditure
		India	1983, 1986-90, 1992, 1994-97	Expenditure
		Nepal	1985, 1995	Expenditure
		Pakistan	1986/87, 1990/91, 1992/93, 1996/97	Expenditure
		Sri Lanka	1985, 1990, 1995	Expenditure
Sub-Saharan Africa	72.9	Botswana	1985/86	Expenditure
		Burkina Faso	1994	Expenditure
		Central African Rep.	1993	Expenditure
		Cote d'Ivoire	1985-88, 1993, 1995	Expenditure
		Ethiopia	1981, 1995	Expenditure
		Gambia	1992	Expenditure
		Ghana	1987, 1989	Expenditure
		Kenya	1992, 1994	Expenditure
		Lesotho	1986, 1993	Expenditure
		Madagascar	1980, 1993, 1997	Expenditure
		Mali	1989, 1994	Expenditure
		Mauritania	1988, 1993, 1995	Expenditure
		Mozambique	1996/97	Expenditure
		Niger	1992, 1995	Expenditure
		Nigeria	1985, 1992, 1997	Expenditure
		Rwanda	1983/85	Expenditure

Senegal	1991, 1994	Expenditure
Sierra Leone	1989	Expenditure
South Africa	1993	Expenditure
Tanzania	1991	Expenditure
Uganda	1988, 1992	Expenditure
Zambia	1991, 1993, 1996	Expenditure
Zimbabwe	1990/91	Expenditure

Note: Since making this list new surveys have become available for Croatia (1998), Czech Republic (1996), Indonesia (1999), Malaysia (1997), Poland (1996), Turkmenistan (1998), Morocco (1998/99) and Madagascar (1997). While these did not arrive in time, they will be included in future up-dates.

Table 2. Population living below $1.08 per day at 1993 PPP

Region	Headcount index (% living in households that consume less than the poverty line)					Number of poor (millions)				
	1987	1990	1993	1996	1998 (prelim.)	1987	1990	1993	1996	1998 (prelim.)
East Asia	26.60	27.58	25.24	14.93	15.32	417.53	452.45	431.91	265.13	278.32
(excluding China)	23.94	18.51	15.87	9.97	11.26	114.14	91.98	83.52	55.08	65.15
Eastern Europe & Central Asia	0.24	1.56	3.95	5.12	5.14	1.07	7.14	18.26	23.82	23.98
Latin America & Caribbean	15.33	16.80	15.31	15.63	15.57	63.66	73.76	70.79	75.99	78.16
Middle East & North Africa	4.30	2.39	1.93	1.83	1.95	9.31	5.66	4.95	5.01	5.55
South Asia	44.94	44.01	42.39	42.26	39.99	474.41	495.11	505.08	531.65	522.00
Sub-Saharan Africa	46.61	47.67	49.68	48.53	46.30	217.22	242.31	273.29	288.97	290.87
Total	28.31	28.95	28.15	24.53	23.96	1183.19	1276.41	1304.29	1190.58	1198.88
(excluding China)	28.51	28.05	27.72	27.01	26.18	879.81	915.94	955.89	980.53	985.71

Table 3. Population living below $2.15 per day at 1993 PPP

Region	Headcount Index (%)					Number of poor (millions)				
	1987	1990	1993	1996	1998 (prelim.)	1987	1990	1993	1996	1998 (prelim.)
East Asia	67.04	66.11	60.52	48.63	49.10	1052.32	1084.44	1035.85	863.86	892.23
(excluding China)	62.90	57.33	51.61	42.78	44.96	299.92	284.92	271.62	236.30	260.11
Eastern Europe & Central Asia	3.59	9.55	17.17	19.91	19.92	16.35	43.83	79.38	92.67	92.87
Latin America & Caribbean	35.54	38.09	35.07	37.00	36.44	147.56	167.21	162.20	179.82	182.86
Middle East & North Africa	30.03	24.76	24.12	22.16	21.88	65.09	58.70	61.75	60.58	62.37
South Asia	86.30	86.76	85.41	85.02	83.96	911.04	975.95	1017.83	1069.48	1095.89
Sub-Saharan Africa	76.52	76.37	77.76	76.87	75.57	356.64	388.24	427.76	457.67	474.81
Total	61.00	61.66	60.10	56.12	55.98	2549.01	2718.37	2784.77	2724.09	2801.03
(excluding China)	58.22	58.77	58.59	57.75	57.60	1796.61	1918.84	2020.54	2096.53	2168.91

Table 4. Poverty gap indices

Region	Poverty gap index (%) ($1.08)					Poverty gap index (%) ($2.15)				
	1987	1990	1993	1996	1998 (prelim.)	1987	1990	1993	1996	1998 (prelim.)
East Asia	6.82	7.64	7.48	4.00	4.17	28.61	28.85	26.25	18.23	18.62
(excluding China)	5.64	4.11	3.59	2.27	2.53	25.92	22.14	19.37	14.45	15.63
Eastern Europe & Central Asia	0.05	0.99	1.29	1.54	1.56	0.88	2.38	5.58	6.37	6.32
Latin America & Caribbean	5.22	5.95	5.81	5.28	5.32	15.54	17.10	15.37	16.06	15.79
Middle East & North Africa	1.01	0.46	0.35	0.38	0.19	12.78	10.65	10.16	9.56	9.32
South Asia	12.97	12.00	11.17	10.55	9.50	41.90	41.42	40.27	39.90	38.88
Sub-Saharan Africa	19.96	20.36	21.67	21.47	20.07	42.11	42.53	44.02	43.36	41.76
Total	8.64	8.97	8.93	7.53	7.20	28.33	28.73	27.93	25.08	24.85
(excluding China)	9.10	8.90	8.84	8.46	7.95	27.82	27.67	27.45	26.82	26.44

Table 5. Relative poverty

Region	Mean poverty line ($/day, 1993 PPP)	Headcount index					Number of poor (millions)				
		1987	1990	1993	1996	1998 (prelim.)	1987	1990	1993	1996	1998 (prelim.)
East Asia	1.29	33.01	33.69	29.82	19.03	19.56	518.25	552.68	510.29	338.00	355.45
(excluding China)	1.92	45.06	38.68	30.76	23.16	24.55	214.86	192.21	161.89	127.95	142.03
Eastern Europe & Central Asia	2.71	7.54	16.19	25.34	26.08	25.60	34.35	74.29	117.12	121.39	119.34
Latin America & Caribbean	3.31	50.20	51.48	51.08	51.95	51.35	208.43	225.97	236.24	252.50	257.71
Middle East & North Africa	1.78	18.93	14.49	13.62	11.40	10.76	41.03	34.35	34.86	31.16	30.69
South Asia	1.08	45.20	44.21	42.52	42.49	40.20	477.21	497.28	506.64	534.53	524.75
Sub-Saharan Africa	1.33	51.09	52.05	54.01	52.80	50.49	238.10	264.60	297.09	314.39	317.20
Total	1.59	36.31	37.41	36.73	32.79	32.08	1517.37	1649.17	1702.24	1591.97	1605.13
(excluding China)	1.79	39.34	39.47	39.26	38.06	36.96	1213.98	1288.70	1353.84	1381.92	1391.71