
How Have the World's Poorest Fared since the Early 1980s?

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A new assessment is made of the developing world's progress against poverty. By the frugal \$1 a day standard there were 1.1 billion poor people in 2001—almost 400 million fewer than 20 years earlier. During that period the number of poor people declined by more than 400 million in China, though half the decline was in the early 1980s and the number outside China rose slightly. At the same time the number of people in the world living on less than \$2 a day rose, so that there has been a marked bunching up of people living between \$1 and \$2 a day. Sub-Saharan Africa has become the region with the highest incidence of extreme poverty and the greatest depth of poverty. If these trends continue, the 1990 aggregate \$1 a day poverty rate will be halved by 2015, meeting the Millennium Development Goal, though only East and South Asia will reach this goal.

A cloud of doubt hangs over our knowledge about the extent of the world's progress against poverty. A widely cited World Bank (2002) estimate is that there were 200 million fewer poor people in the world in 1998 than in 1980. This figure has been contested and for good reasons. Deaton (2002b) contrasts this seemingly optimistic assessment with the estimate in *World Development Report 2000/2001: Attacking Poverty* (World Bank 2000), which appeared to show little or no progress. Deaton argues that the claim in World Bank (2002) was based on methodologically inconsistent estimates from two studies—Bourguignon and Morisson (2002) (up to 1992) and Chen and Ravallion (2000) (beyond that).¹ With reference to the relevant chart in World Bank (2002) Deaton writes:

The historical data in this chart were assembled by François Bourguignon and Christian Morisson. . . . They derive their estimates by applying (sometimes sketchy and outdated) distributional information to the consumption figures from national accounts data, a technique that is almost certainly the

only methodology that would allow the construction of data for a century and a half. . . . After 1993, when the Bourguignon and Morrisson data end, *Globalization* [World Bank 2002] uses the poverty estimates that were assembled by Shaohua Chen and Martin Ravallion. . . . But Chen and Ravallion's data from 1987 to 1993, which is when poverty increased, are dropped from the chart. In consequence, and without any new information, we go from an assessment that the number of poor people in the world was showing little or no decline from 1987 to 1998 in *Attacking Poverty* to an assessment, in *Globalization*, of a continuous and accelerating decline from 1980 to 1998. (see www.imf.org/external/pubs/ft/fandd/2002/06/deaton.htm)

These concerns are too important to ignore. The splicing of these different data sources is questionable. The only solution is to construct a new, internally consistent series over the 1980s and 1990s.

This article offers a new assessment of progress in reducing poverty over 1981–2001 using more consistent data and methods—closely following the methods underlying the *Attacking Poverty* (World Bank 2000) numbers, which had been based on Chen and Ravallion (2000). In common with our past estimates, we draw on nationally representative surveys as much as possible. The article reviews our methods of measuring poverty from those surveys and notes any changes from past estimates, though we refer readers to other sources for further discussion of our methods and alternatives.² The new estimates presented here supersede all our previous estimates in that we recalculate everything back in time on a consistent basis incorporating the new data.³

We summarize our results in a standard regional tabulation following previous work. However, we have also created a Web-based interactive tool, PovcalNet, that allows users to access the primary distributions and so estimate poverty measures for alternative country groupings or for a selected set of individual countries (<http://iresearch.worldbank.org/povcalnet>).

A notable feature of these new estimates is that they go back to the early 1980s, allowing an assessment of the validity of the poverty reduction claim in World Bank (2002). We have previously resisted going back this far because of concerns about the coverage and quality of the survey data available for the early 1980s. Our efforts to expand coverage have helped allay our fears about reliability of the data from this time period. However, it is clear that our estimates for the first year in our series, 1981, are not as reliable as those in the rest of the series.

The new estimates suggest that the World Bank (2002) figure of 200 million fewer poor people is probably an underestimate. Indeed, our best estimates suggest that the figure is almost twice that number. That is good news. However, closer inspection of the data leaves little room for complacency about the world's progress

against poverty. Indeed, the picture that emerges is one of highly uneven progress, with serious setbacks in some regions and time periods. The number of people living on less than \$2 a day has risen.

It should not be forgotten that there are limitations to our measures. There are continuing concerns about aspects of the underlying data, including the purchasing power parity (PPP) exchange rates, the accuracy and comparability of the surveys used, and intrinsic limitations of the welfare measures based on those surveys. Potentially important examples of the limitations of the welfare measures is that our definition of poverty does not directly reflect inequality within households or access to public goods.

The article first describes the coverage of the survey data. It then discusses the poverty line and exchange rates, followed by the measures of poverty, and then presents the main results.

Coverage of the Household Surveys

This is our first attempt to estimate global poverty measures back to the early 1980s. Our previous estimates started in 1987 (Chen and Ravallion 2000, 2001). In retrospect, starting the series in 1987 was an unfortunate choice, because the late 1980s and early 1990s were a difficult time for the world's poor, given sharply lower growth in both China and India. Going back further in time should give a clearer idea of the long-term trend.

We draw on 454 surveys covering 97 countries representing 93 percent of the population of all low- and middle-income countries (Part 2 member countries of the World Bank). Taking the most recent survey for each country, about 1.1 million households were interviewed. The surveys were mostly done by government statistics offices as part of their routine operations.

The poverty measures are estimated from the survey data. No secondary sources are used for measuring poverty at each survey round (unlike all other compilations of distributional data and global poverty measures that we know of), although other data sources are used for interpolation, given that the surveys of different countries do not coincide in time. Households are ranked by consumption or income per person. The distributions are weighted by household size and sample expansion factors, so that a given fractile (such as the poorest decile) has the same share of the country-specific population across the sample. Thus the poverty counts give the number of people living in households with per capita consumption or income below the poverty line. The data come in various forms, ranging from micro data to specially designed grouped tabulations from the raw data constructed following our guidelines. Datt and Ravallion (1992) and Chen and others (1994) describe our estimation methods for grouped data.

As in previous work we try to eliminate obvious comparability problems, either by reestimating the consumption or income aggregates or by dropping a survey. However, there are problems that we cannot deal with. Differences in survey methods (such as in questionnaire design) can create nonnegligible differences in the estimates for consumption or income. For example, although one-week recall for food consumption is common in surveys, some countries use a longer period, which is likely to give a lower estimate of consumption and hence higher measured poverty. An unusual case is China, in which households are surveyed frequently throughout the year, allowing an estimate of annual income, whereas other countries typically use recall data for a month or less, obtained from one or just a few interviews; there is evidence that China's practice yields lower inequality measures (Gibson and others 2001).

A specific data problem that has received attention in the recent literature concerns the 55th round of India's National Sample Survey (NSS) for 1999/2000, which has created a potentially serious comparability problem with previous NSS rounds (see Datt and Ravallion 2002; Deaton 2002a, 2003). For greater comparability with previous NSS rounds, we use Deaton's (2003) adjusted distributions. The official distributions from the 55th round give a lower poverty rate in 1999/2000 (32.3 percent below \$1 a day compared with 34.8 percent using Deaton's corrections). (The distributions are, of course, the same in the previous large sample survey, for which we obtain a \$1 a day poverty rate of 41.9 percent.) However, Deaton's correction requires an unchanging probability of being poor conditional on consumption of the goods that appear to have been unaffected by the change in survey design. Changes in relative prices can cast doubt on this assumption (Datt and Ravallion 2002; Sen and Himanshu 2003).

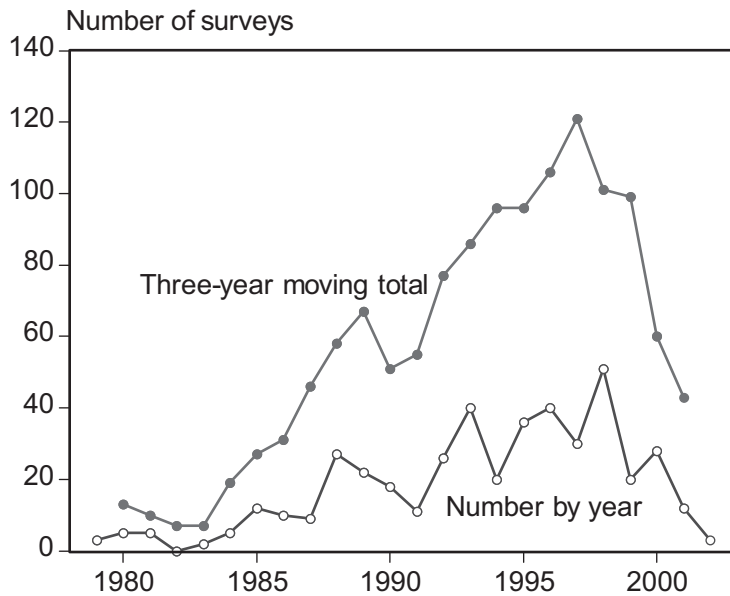
Possibly, Deaton's method overestimates the decline in poverty in India between the 55th and previous rounds. An alternative approach to comparing the surveys for 1999/2000 with the previous large sample survey of 1993 has been proposed by Sundaram and Tendulkar (2003). It entails comparing estimates over time based on a mixed recall period instead of the uniform recall period used by the official data and by Deaton (2003). The comparison is possible only between these two surveys. With the Sundaram and Tendulkar distributions, the \$1 a day poverty rate for India falls from 38.7 percent in 1993 to 32.3 percent in 1999/2000—a 6.4-percentage-point drop rather than our 7.1-percentage-point drop estimate using the Deaton-adjusted distributions.

Appendix table A.1 lists the surveys used, their dates, and whether consumption or income data are used. Population coverage varies greatly by region, ranging from 74 percent of the population of the Middle East and North Africa to 98 percent of the population of South Asia. Not all available surveys are included. Surveys are excluded if essential data are missing (such as for the PPP exchange rates or consumer price indices used to update poverty lines over time) or if there are serious comparability problems with the rest of the data set.

Naturally, the further back one goes, the fewer the number of surveys. Coverage deteriorates in the last year or two of the series, given the lags in survey processing. A simple but useful guide to the reliability of our estimates is to count the number of surveys by year and to compare the number with the three-year moving total centered on each year—given that having a survey last year or next year can help greatly in estimating poverty this year (figure 1). By this measure, our estimates are the most reliable for the mid- to late 1990s and the least reliable for 1981. We have only 15 surveys up to 1983, though the number rises sharply to 32 surveys for the period up to 1985. By contrast, we have 86 surveys during 1986–90.

Most regions are still quite well covered, from at least the second half of the 1980s (East and South Asia being well covered from 1981 onward). Two exceptions stand out. Unsurprisingly, country coverage in Eastern Europe and Central Asia is weak for the 1980s, when most of these countries did not officially exist. More worrying is the lack of coverage for Sub-Saharan Africa in the 1980s. The estimates for the early 1980s rely heavily on projections based on distributions for the late 1980s, as a list of the average survey year by region for each reference year

Figure 1. Number of National Household Surveys by Year, 1979–2002



Source: National household surveys.

shows (table 1). Although survey coverage for Africa has improved considerably over our previous estimates (Chen and Ravallion 2001), the weakness of the coverage of Africa should be kept in mind when interpreting our results.

Even in regions with seemingly good survey coverage in the 1980s, there are questions about some of the data. The other side of the coin of improved household survey data for developing countries in the 1990s is the much weaker survey data in the 1980s. Consider China, the country with the largest population. The National Bureau of Statistics (NBS) has provided us with income distributions for China from surveys done in 1980 (rural areas) and 1981 (urban). However, the NBS was only beginning to resume doing national household surveys at that time (it had ceased doing surveys during the Cultural Revolution, 1966–76) and it can be conjectured that these early efforts were not as good (Chen and Ravallion 1996). The early NBS surveys (prior to 1985) did not include 30 percent of provinces. However, this does not appear to be a source of bias because the provincial coverage was uncorrelated with poverty; we could convincingly reject the null hypothesis that the first available estimates of all our poverty measures were the same for provinces omitted as for those included (Ravallion and Chen 2004). The sample sizes for these early surveys are also smaller than the other NBS surveys for China that we use, though the sample sizes are still adequate. For the 1980 survey in rural areas, 16,000 randomly sampled households were interviewed, and for the 1981 urban sample, about 9,000. By contrast, from 1985 onward the sample sizes were about 70,000 in rural areas and 30,000 in urban areas.

Table 1. Average Date of the Surveys Used for Each Reference Year, 1981–2001

| <i>Region</i> | <i>1981</i> | <i>1984</i> | <i>1987</i> | <i>1990</i> | <i>1993</i> | <i>1996</i> | <i>1999</i> | <i>2001</i> |
|------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| East Asia | 1981.5 | 1984.6 | 1987.4 | 1990.4 | 1992.5 | 1996.1 | 1999.1 | 2000.4 |
| Eastern Europe and Central Asia | 1988.2 | 1988.1 | 1988.3 | 1989.6 | 1993.6 | 1995.7 | 1998.9 | 1999.7 |
| Latin America and the Caribbean | 1983.2 | 1984.7 | 1986.6 | 1990.4 | 1992.5 | 1996.1 | 1998.1 | 2000.1 |
| Middle East and North Africa | 1987.1 | 1987.8 | 1988.1 | 1990.0 | 1993.0 | 1996.0 | 1998.0 | 1998.2 |
| South Asia | 1980.9 | 1983.9 | 1987.2 | 1989.7 | 1993.0 | 1995.9 | 1999.0 | 1999.4 |
| Sub-Saharan Africa | 1988.6 | 1988.3 | 1989.6 | 1990.2 | 1993.0 | 1995.1 | 1996.6 | 1997.0 |
| Total | 1982.8 | 1985.3 | 1987.7 | 1990.2 | 1992.8 | 1995.9 | 1998.5 | 1999.4 |

Note: Population-weighted mean for all the surveys that were used to estimate the poverty measures for each reference year.

Source: National household surveys.

Exchange Rates and Poverty Lines

We use the same PPP estimates for consumption as Chen and Ravallion (2001), which were produced by the World Bank's Data Group (data sources and methods are described in Ahmad 2003). For 69 of the sample 97 countries, the PPPs are based on price and consumption basket data collected by the 1993 International Comparison Project (ICP). For almost all countries that did not participate in the 1993 ICP, the bank's PPPs are based on interpolations from the cross-country regressions described in Ahmad (2003). Two exceptions are China and India, for which the bank's PPPs are based on other sources—India's on an update of the country's 1985 PPP and China's on a credible independent study of prices levels in 10 cities (Ahmad 2003). As in Chen and Ravallion (2000), the Penn World Tables are used in preference to the World Bank's PPPs for five countries (Ghana, Mauritania, Nicaragua, the Philippines, and Uganda) for which the bank's PPPs give poverty rates that are implausibly low, whereas the PPPs for 1993 from the Penn World Tables (version 5.6) give more believable estimates.⁴

The international poverty line in our work prior to Chen and Ravallion (2001) was set at \$1 a day at 1985 PPP (more precisely, at \$31 a month or \$1.02 a day; see Ravallion and others 1991). The original \$1 a day poverty line was chosen as being representative of the poverty lines typical of low-income countries (Ravallion and others 1991). The same principle was applied by Chen and Ravallion (2001) in updating the poverty line using the new PPPs for 1993.

But the 1985 PPPs based on Penn World Tables are not comparable with the World Bank's PPPs at base 1993, either in primary data or method used. So one cannot update the poverty line simply by adjusting for inflation in the United States between 1985 and 1993. Indeed, that gives a poverty line that is well above those typical of low-income countries (Chen and Ravallion 2001).⁵ To be consistent with the original aim of using a poverty line that is representative of the lines actually found in poor countries, we recalculate the dollar value of the original set of poverty lines using the new PPPs and compare this with mean consumption, also calculated by the new PPPs. Following Chen and Ravallion (2001), the resulting poverty line is \$1.08 a day (\$32.74 per month) in 1993 PPP prices. This is the median of the 10 lowest poverty lines in the set of countries used by Ravallion and others (1991). This is the main poverty line focused on here and is referred to as the "\$1 a day" line or "extreme poverty."

However, the poverty rate on this basis must be deemed a conservative estimate, because aggregate poverty in the developing world is defined by perceptions of poverty rates in the poorest countries. (Not a new observation, this was argued explicitly in World Bank 1990 and Ravallion and others 1991.) Thus two broader definitions are also considered. In one the poor include all those who would be judged poor by standards more typical of middle-income countries. For this purpose the poverty line is set at twice the \$1 a day line.

The second definition allows for “relative poverty.” Chen and Ravallion (2001) proposed an operational approach for measuring relative poverty, building on Atkinson and Bourguignon (1999). By this measure of relative poverty people are deemed poor if they do not attain either the \$1 a day consumption level (loosely interpretable as “physical needs”) or a given proportion of mean consumption (“social needs”). The constant of proportionality was set at one-third, which gave the best fit to the data on poverty lines for developed and developing economies used in setting the \$1.08 poverty line (Chen and Ravallion 2001). We fix the real value of the relative poverty line over time for each country. So these poverty lines are relative between countries but absolute over time. (Chen and Ravallion 2001 discuss this choice further.) Making the poverty lines relative over time would mean that for countries with mean consumption of greater than \$3.23 a day the poverty measures will be independent of the absolute levels of consumption (and depend solely on the percentile of the population for which the Lorenz curve has a slope of 1/3).

Measuring Poverty from the Surveys

Three poverty measures are computed. The first measure is the *headcount index*, given by the percentage of the population living in households with consumption or income per person below the poverty line. This is the easiest measure to interpret, but it has the well-known deficiency that it says nothing about differences in the depth of poverty below the line. A second measure, the *number of poor people*, is obtained by applying the estimated headcount index to the population of each region (under the assumption that countries without surveys have the same headcount index on average as those with surveys). A third measure, the *poverty gap index*, gives mean distance below the poverty line as a proportion of the poverty line (where the mean is taken over the whole population, counting the nonpoor as having zero poverty gap). PovcalNet also gives estimates of the squared poverty gap, in which individual poverty gaps are weighted by the gaps themselves, to reflect inequality among the poor (Foster and others 1984).

In keeping with our previous work, we aim to measure poverty in terms of household consumption expenditure per capita. Of the 454 surveys used, 247 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. Whenever there is a choice consumption data are preferred to income data, because consumption is likely to be the better measure of current welfare. About one-quarter of the cases without consumption distributions do have survey-based estimates of mean consumption. For those cases the income mean is replaced by the consumption mean, leaving the Lorenz curve the same (all incomes are scaled up by the ratio of the consumption mean to the income mean). There is, however, no obvious basis

for adjusting the Lorenz curve; one expects higher inequality in an income distribution than in a consumption distribution for the same place and data.

Our previous estimates for China (Chen and Ravallion 2001) relied on income Lorenz curves, but we used the survey means for household consumption expenditure per capita supplied by the NBS. For this update we obtained complete consumption distributions from the NBS back to 1990. To maintain consistency with our methods for other countries, we switch to consumption (for both the distribution and the mean) from 1990 onward, though we have no choice but to keep our old method for the 1980s. This raises a concern about comparability between our estimates for China for the 1990s and for the 1980s. To assess whether this is a problem, we also calculate our estimates for the 1990s using the old method. The two sets of estimates for the 1990s match up quite closely (table 2), so the comparisons over time do not appear to be of concern. Ravallion and Chen (2004) discuss this and other issues concerning China's poverty and inequality data in greater detail.

One important difference with Chen and Ravallion (2001) is that when only an income distribution is available, we do not follow our past practice of rescaling mean income by one minus the national savings rate. This practice was questioned by Deaton (2002a), and in Chen and Ravallion (2001) we noted the implications of

Table 2. Poverty Headcount Estimates for China by Old and New Methods, 1990–2001

| Year | Poverty line (1993 PPP\$) | Headcount index (%) | |
|------|---------------------------|---|--|
| | | Old method: income distribution with adjustment to the mean (%) | New method: consumption distribution with consumption mean (%) |
| 1981 | 1.08 | 63.76 | |
| | 2.15 | 88.12 | |
| 1984 | 1.08 | 40.99 | |
| | 2.15 | 78.49 | |
| 1987 | 1.08 | 28.45 | |
| | 2.15 | 67.41 | |
| 1990 | 1.08 | 31.53 | 33.01 |
| | 2.15 | 69.93 | 72.64 |
| 1993 | 1.08 | 29.46 | 28.36 |
| | 2.15 | 64.59 | 68.13 |
| 1996 | 1.08 | 16.91 | 17.38 |
| | 2.15 | 50.63 | 53.36 |
| 1999 | 1.08 | 16.42 | 17.77 |
| | 2.15 | 47.19 | 50.05 |
| 2001 | 1.08 | 16.51 | 16.64 |
| | 2.15 | 44.45 | 46.67 |

Source: Authors' calculations based on China's national household surveys.

dropping this rescaling. Since then we have assembled surveys for 27 countries for which we have both consumption and income distributions, to test this assumption in our past work by calculating the poverty measures using both consumption and income for the same country. There is only a small and statistically insignificant difference between the two sets of estimates: Consumption has a lower mean but also lower inequality, with the effect that poverty measures are quite close. For the \$1 a day line the mean headcount index is 17.8 percent for consumption and 21.2 percent for income; the difference is not statistically significant ($t=0.73$; $n=27$). For the \$2 a day line the mean headcount index is slightly higher for consumption (48.2 percent) than for income (44.8 percent) but, again the difference is not statistically significant ($t=0.49$). So we abandon our past practice of rescaling the mean for income surveys. The main implication is that our poverty measures for Latin America (where income surveys are more common than elsewhere) drop a few percentage points.

Having converted the international poverty line at PPP to local currency in 1993, we convert it to the prices prevailing at each survey date using the country-specific official consumer price index (CPI).⁶ 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 people at the poverty line.

To estimate regional poverty at a given reference year (say, 1998) we “line up” the surveys in time using the same method as in our past work. We start the series in 1981 and make estimates at three yearly intervals, except for 2002, when there were too few surveys, so we estimate for 2001 instead. We thus make estimates for 1981, 1984, 1987, 1990, 1993, 1996, 1999, and 2001. These are called reference years, as distinct from survey years, which are spread over the interval 1979–2002 (see figure 1).

For the 97 countries, 9 have only one survey, 19 have two surveys, and 69 have three or more surveys over the period. If there is only one survey for a country, measures for each reference year are estimated by applying the growth rate in real private consumption per person from the national accounts to the survey mean—assuming that the Lorenz curve for that country does not change.⁷ This seems the best option for dealing with this problem, though there can be no guarantee that the Lorenz curve would not have shifted or that a survey-based measure of consumption would have grown at the same rate as private consumption in the national accounts. For example, growth of private consumption in the national accounts might reflect growth in spending by nonprofit organizations—which are not separated from households in the national accounts for most developing economies—rather than growth in household spending (Ravallion 2003b).

When the reference date (say, 1993) is between two surveys (say, 1989 and 1995), one option is simply to interpolate between the two surveys. However, this could be problematic when there is a long time period between surveys, and it ignores the extra information available from the national accounts data. To bring the national accounts information into the picture, mean consumption is first estimated at the reference year using the national accounts growth rate between the survey year and the reference year. For the example here there are 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 . Using the 1989 distribution and $M93(89)$ yields headcount index $H93(89)$. Similarly, using the 1995 distribution and the 1993 mean yields $H93(95)$. Then the poverty headcount for 1993 is estimated as the weighted average of $H93(89)$ and $H93(95)$.⁸

Results

Estimates of the headcount indices for \$1.08 at 1993 PPP for 1981–2001 show that the percentage of the population of the developing world living below \$1 a day was almost halved over 1981–2001, falling from 40 percent to 21 percent (table 3). Expressed as a proportion of world population, the decline is from 33 percent to 18 percent. This assumes that nobody in developed areas lives below \$1 a day.) The number of poor people fell by 390 million, from 1.5 billion in 1981 to 1.1 billion in 2001 (table 4).

There was clearly more progress in some periods than in others. As already noted, the late 1980s and early 1990s were a difficult period for the world's poor, with low growth in both China and India. Once growth was restored, the rate of poverty reduction by the \$1 a day standard in the 1990s had returned to its long-term trend. The percentage below \$1 a day fell from 28 percent to 21 percent over 1990–2001, about the same trend decline (in percentage points per year) as for 1984–2001 as a whole. The number of poor people fell by about 130 million in 1990s. The poverty measures for \$2 a day follow a broadly similar pattern, though with a less dramatic decline in the early 1980s and even stronger signs of stagnation in the period around 1990 (see tables 3 and 4).

The new estimates suggest less progress in getting over the \$2 a day line. By this higher standard the poverty rate has fallen from 67 percent in 1981 to 53 percent in 2001 (see table 3). This has not been sufficient to prevent a rise in the number of people living below \$2 a day, from 2.4 billion to 2.7 billion (see table 4). Thus the number of people living between \$1 and \$2 has risen sharply over these two decades, from about 1 billion to 1.6 billion. This marked bunching up of people just above the \$1 line suggests that a great many people in the world remain vulnerable to aggregate economic slowdowns.

Table 3. Headcount Indices of Poverty by Region for Two International Poverty Lines, 1981–2001 (%)

| <i>Poverty line and region</i> | 1981 | 1984 | 1987 | 1990 | 1993 | 1996 | 1999 | 2001 |
|---------------------------------|------|------|------|------|------|------|------|------|
| <i>\$1.08 a day (1993 PPP)</i> | | | | | | | | |
| East Asia | 57.7 | 38.9 | 28.0 | 29.6 | 24.9 | 16.6 | 15.7 | 14.9 |
| China | 63.8 | 41.0 | 28.5 | 33.0 | 28.4 | 17.4 | 17.8 | 16.6 |
| East Asia excluding China | 42.0 | 33.5 | 27.0 | 21.1 | 16.7 | 14.7 | 11.0 | 10.8 |
| Eastern Europe and Central Asia | 0.7 | 0.5 | 0.4 | 0.5 | 3.7 | 4.3 | 6.3 | 3.6 |
| Latin America and Caribbean | 9.7 | 11.8 | 10.9 | 11.3 | 11.3 | 10.7 | 10.5 | 9.5 |
| Middle East and North Africa | 5.1 | 3.8 | 3.2 | 2.3 | 1.6 | 2.0 | 2.6 | 2.4 |
| South Asia | 51.5 | 46.8 | 45.0 | 41.3 | 40.1 | 36.6 | 32.2 | 31.3 |
| India | 54.4 | 49.8 | 46.3 | 42.1 | 42.3 | 42.2 | 35.3 | 34.7 |
| South Asia excluding India | 42.2 | 37.0 | 41.0 | 38.7 | 33.1 | 19.7 | 22.9 | 21.0 |
| Sub-Saharan Africa | 41.6 | 46.3 | 46.8 | 44.6 | 44.1 | 45.6 | 45.7 | 46.4 |
| Total | 40.4 | 32.8 | 28.4 | 27.9 | 26.3 | 22.8 | 21.8 | 21.1 |
| Total excluding China | 31.7 | 29.8 | 28.4 | 26.1 | 25.6 | 24.6 | 23.1 | 22.5 |
| <i>\$2.15 a day (1993 PPP)</i> | | | | | | | | |
| East Asia | 84.8 | 76.6 | 67.7 | 69.9 | 64.8 | 53.3 | 50.3 | 47.4 |
| China | 88.1 | 78.5 | 67.4 | 72.6 | 68.1 | 53.4 | 50.1 | 46.7 |
| East Asia excluding China | 76.2 | 72.0 | 68.4 | 63.2 | 56.7 | 53.2 | 50.8 | 49.2 |
| Eastern Europe and Central Asia | 4.7 | 4.1 | 3.2 | 4.9 | 17.3 | 20.7 | 23.8 | 19.7 |
| Latin America and Caribbean | 26.9 | 30.4 | 27.8 | 28.4 | 29.5 | 24.1 | 25.1 | 24.5 |
| Middle East and North Africa | 28.9 | 25.2 | 24.2 | 21.4 | 20.2 | 22.3 | 24.3 | 23.2 |
| South Asia | 89.1 | 87.2 | 86.7 | 85.5 | 84.5 | 81.7 | 78.1 | 77.2 |
| India | 89.6 | 88.2 | 87.3 | 86.1 | 85.7 | 85.2 | 80.6 | 79.9 |
| South Asia excluding India | 87.3 | 84.0 | 85.0 | 83.5 | 81.0 | 71.3 | 70.5 | 69.0 |
| Sub-Saharan Africa | 73.3 | 76.1 | 76.1 | 75.0 | 74.6 | 75.1 | 76.0 | 76.6 |
| Total | 66.7 | 63.7 | 60.1 | 60.8 | 60.2 | 55.5 | 54.4 | 52.9 |
| Total excluding China | 58.8 | 58.4 | 57.5 | 56.6 | 57.4 | 56.3 | 55.8 | 54.9 |

Source: Authors' calculations based on national household survey data.

Regional Differences

Performance in poverty reduction has been far from uniform across regions. Indeed, there have been notable changes in regional poverty rankings over this period. In 1981 East Asia had the highest incidence of extreme poverty in the world, with 58 percent of the population living below \$1 a day. Next was South Asia, followed by Sub-Saharan Africa, Latin America, Middle East and North Africa, and Eastern Europe and Central Asia. Twenty years later, Sub-Saharan Africa had swapped places with East Asia, where the headcount index had fallen to 15 percent. South Asia remained in second place, but Eastern Europe and Central Asia had overtaken the Middle East and North Africa. The ordering of regions is not, however, robust to the choice of poverty line. At the \$2 a day poverty line South Asia edges out East

Table 4. Number of Poor People by Region for Two International Poverty Lines, 1981–2001 (millions)

| Poverty line and region | 1981 | 1984 | 1987 | 1990 | 1993 | 1996 | 1999 | 2001 |
|------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| \$1.08 a day (1993 PPP) | | | | | | | | |
| East Asia | 795.6 | 562.2 | 425.6 | 472.2 | 415.4 | 286.7 | 281.7 | 271.3 |
| China | 633.7 | 425.0 | 308.4 | 374.8 | 334.2 | 211.6 | 222.8 | 211.6 |
| Eastern Europe and Central Asia | 3.1 | 2.4 | 1.7 | 2.3 | 17.5 | 20.1 | 30.1 | 17.0 |
| Latin America and Caribbean | 35.6 | 46.0 | 45.1 | 49.3 | 52.0 | 52.2 | 53.6 | 49.8 |
| Middle East and North Africa | 9.1 | 7.6 | 6.9 | 5.5 | 4.0 | 5.5 | 7.7 | 7.1 |
| South Asia | 474.8 | 460.3 | 473.3 | 462.3 | 476.2 | 461.3 | 428.5 | 431.1 |
| India | 382.4 | 373.5 | 369.8 | 357.4 | 380.0 | 399.5 | 352.4 | 358.6 |
| Sub-Saharan Africa | 163.6 | 198.3 | 218.6 | 226.8 | 242.3 | 271.4 | 294.3 | 312.7 |
| Total | 1,481.8 | 1,276.8 | 1,171.2 | 1,218.5 | 1,207.5 | 1,097.2 | 1,095.7 | 1,089.0 |
| \$2.15 a day (1993 PPP) | | | | | | | | |
| East Asia | 1169.8 | 1108.6 | 1028.3 | 1116.3 | 1079.3 | 922.2 | 899.6 | 864.3 |
| China | 875.8 | 813.8 | 730.8 | 824.6 | 802.9 | 649.6 | 627.5 | 593.6 |
| Eastern Europe and Central Asia | 20.2 | 18.3 | 14.7 | 22.9 | 81.3 | 97.8 | 113.0 | 93.3 |
| Latin America and Caribbean | 98.9 | 118.9 | 115.4 | 124.6 | 136.1 | 117.2 | 127.4 | 128.2 |
| Middle East and North Africa | 51.9 | 49.8 | 52.5 | 50.9 | 51.8 | 60.9 | 70.4 | 69.8 |
| South Asia | 821.1 | 858.6 | 911.4 | 957.5 | 1004.8 | 1029.1 | 1039.0 | 1063.7 |
| India | 630.0 | 661.4 | 697.1 | 731.4 | 769.5 | 805.7 | 804.4 | 826.0 |
| Sub-Saharan Africa | 287.9 | 326.0 | 355.2 | 381.6 | 410.4 | 446.8 | 489.3 | 516.0 |
| Total | 2,450.0 | 2,480.1 | 2,477.5 | 2,653.8 | 2,763.6 | 2,674.1 | 2,738.8 | 2,735.4 |

Source: Authors' calculations based on national household survey data.

Asia for the highest headcount index in 1981, and it edges out Africa for the highest headcount index in 2001.

The dramatic progress in East Asia has meant that by 2001 the region had already reached the Millennium Development Goal of halving the 1990 \$1 a day poverty rate by 2015. China's progress against absolute poverty was a key factor (given the country's population weight), though the rest of East Asia had the same proportionate decline in poverty over 1981–2001 as did China (see table 3). In 1981 China's incidence of poverty at the \$1 a day measure was roughly twice that for the rest of the developing world; by the mid-1990s China's poverty rate had

fallen well below the average. There were 400 million fewer people living under \$1 a day in China in 2001 than 20 years earlier, though a staggering half of this decline was in the period 1981–84 (see table 4). This was enormous progress for China's (and the world's) poor people. The most plausible explanation would appear to be China's reforms, starting in the late 1970s, which decollectivized agriculture and, in the "household responsibility system," gave farmers considerably greater control over their land and output choices (Ravallion and Chen 2004 discuss this and other explanations for China's success against absolute poverty). This was a one-off reform, however, suggesting that the sharp drop in global poverty by the \$1 a day standard in the early 1980s was also unusual. China experienced a further drop in the poverty count of 120 million between 1993 and 1996, which is generally attributed to the substantial but short-lived increases in 1994 and 1995 in the procurement prices for food grains paid by the government, which greatly reduced the burden on farmers of this form of taxation (World Bank 1997; Ravallion and Chen 2004).

The long-run trend decline in the global \$1 a day poverty rate over 1981–2001 is 0.86 percentage point a year (table 5). For 1984–2001, which is more indicative of the overall trend given the unusual large decline in extreme poverty between 1981 and 1984 resulting from China's agrarian transition, the trend is 0.66 percentage point a year.⁹ Focusing on the 1990s could also be deceptive, because the early 1990s had relatively high poverty as a result of the stalled growth in China and India.

For the developing world outside China, the headcount index for the \$1 a day poverty line fell from 32 percent to 23 percent over 1981–2001. This was not sufficient to prevent an increase in the total number of poor people, which rose from 850 million to 880 million. The decline in the headcount index over time in the developing world excluding China was close to linear (figure 2), with a trend decline of 0.42 percentage point a year (with a standard error of 0.029).

The number of poor people has also fallen in South Asia, from 475 million in 1981 to about 430 million in 2001 (figure 3), and the poverty rate fell from 52 percent to 31 percent. The South Asia series suggests a remarkably robust trend rate of decline in the \$1 a day headcount index of 1 percentage point a year (see table 5). (For South Asia a linear trend clearly fits better than an exponential trend.) If maintained, this will be sufficient to reach the Millennium Development Goal for poverty reduction. The critical value needed to reach the goal is -0.83 percentage point a year, which is outside the 95 percent confidence interval ($-0.87, -1.09$) for the estimate of South Asia's trend rate of poverty reduction.

The extent of bunching up that has occurred between the \$1 and \$2 a day poverty lines is particularly striking in East and South Asia, where the total number is 1.2 billion, roughly equally split between the two regions. Although this points again to the vulnerability of the poor, it also suggests that substantial further

Table 5. Trend Rates of Change by Region in the Headcount Index for the \$1 a Day Poverty Line, 1981–2001 and 1984–2001 (percentage points per year)

| <i>Region</i> | <i>1981–2001</i> | <i>1984–2001</i> | <i>Critical rate for halving the 1990 headcount index</i> |
|-----------------------------|------------------|------------------|---|
| East Asia | –1.87* (0.32) | –1.36* (0.19) | –0.59 |
| China | –1.99* (0.40) | –1.37* (0.26) | –0.66 |
| Latin America and Caribbean | –0.03 (0.04) | –0.10 (0.03) | –0.23 |
| South Asia | –0.98* (0.05) | –0.95* (0.05) | –0.83 |
| India | –0.91* (0.10) | –0.83* (0.12) | –0.84 |
| Sub-Saharan Africa | 0.12 (0.09) | 0.00 (0.08) | –0.89 |
| Total | –0.86* (0.12) | –0.66* (0.06) | –0.56 |

*Significant at the 1 percent level.

Note: The numbers in parentheses are standard errors. Eastern Europe and Central Asia and the Middle East and North Africa regions are dropped from this table because there were so few people living below the \$1 a day poverty line in 1990. Trends were estimated by linear regression on time. All regressions were tested for first-order serial correlation in the errors using the Lagrange multiplier tests. The null hypothesis of serial independence could not be rejected in any case.

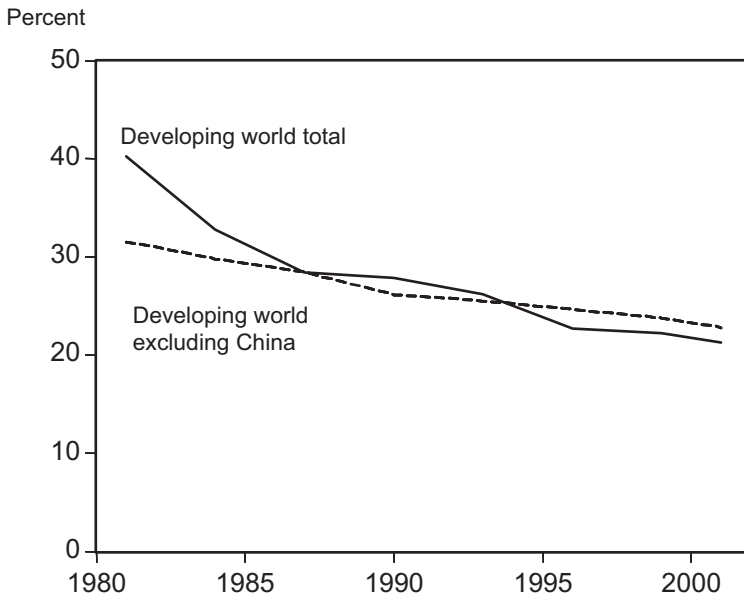
Source: Authors' calculations based on national household survey data.

impacts on poverty can be expected from economic growth, provided that it does not come with higher inequality.

There is less sign of progress against poverty outside Asia. The number of poor people increased in Latin America, where the poverty rate has been roughly constant over time (10 percent for \$1 a day and 25 percent for \$2 a day, which is closer to the national poverty lines in that region). The Middle East and North Africa region experienced a marked downward trend in the poverty rate during the 1980s, but the rate stabilized in the 1990s at around 2 percent for the \$1 a day poverty line and at a little more than 20 percent for the \$2 a day line.

Both the incidence of poverty and the number of poor people rose in Eastern Europe and Central Asia in the 1990s compared with the 1980s. Although very few people live below \$1 a day in this region, the poverty rate by the \$2 a day standard rose from almost 2 percent in 1981 to 20 percent in 2001. However, the paucity of survey data for this region in the 1980s should not be forgotten. Thus the estimates are based heavily on interpolations, which do not allow for any changes in distribution. Distribution was probably better from the point of view of the poor in the

Figure 2. Headcount Indices of Poverty Incidence in the Developing World for the \$1 a Day International Poverty Line, with and without China, 1981–2001



Note: The actual \$1 a day poverty line is \$1.08 (1993 PPP).

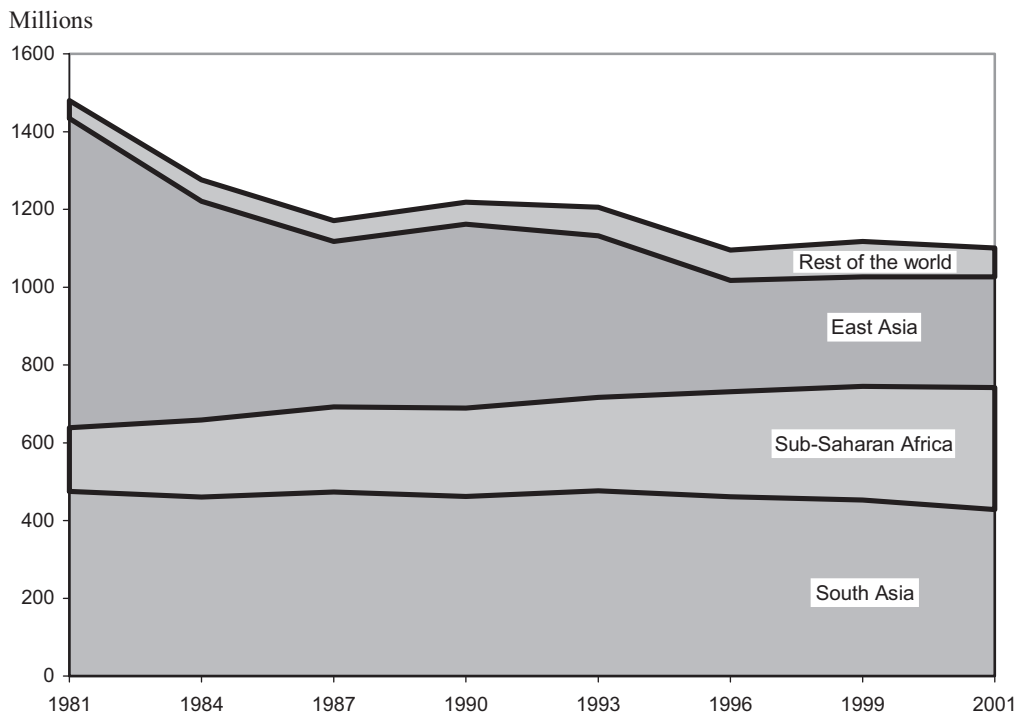
Source: Authors' calculations based on national household survey data.

1980s, in which case poverty would have been even lower than estimated here. There are also some signs of recent progress for the poorest in the region, though it is too early to say if this represents a change in trend.

The incidence of poverty in Sub-Saharan Africa has fluctuated around a mean of 45 percent for the \$1 a day line (75 percent for the \$2 a day line), with no significant trend in either direction (see table 5). The number of poor people almost doubled over 1981–2001, from 164 million to 316 million. By the \$1 a day measure the share of the world's poor living in Africa has risen from 11 percent in 1981 to 29 percent in 2001.

The critical rates of decline in poverty needed to achieve the Millennium Development Goal by 2015 are given in table 5. The actual trend rates of decline in the aggregate \$1 a day poverty rate will be sufficient to achieve the Millennium Development Goal if progress is maintained until 2015. However, the variations found over time point to a need for caution. For the full time period studied, the critical trend needed to reach the Millennium Development Goal is just outside the 95 percent confidence interval for the estimated trend, so it can be claimed with

Figure 3. Number of Poor People by Region for the \$1 a Day International Poverty Line, 1981–2001



Note: The actual \$1 a day poverty line is \$1.08 (1993 PPP).

Source: Authors' calculations based on national household survey data.

95 percent confidence that the trend over 1981–2001 exceeds that needed to halve the 1990 headcount index for \$1 a day. However, 1981–84 was an unusual subperiod, as we have noted. For the period 1984–2001 the critical trend for the Millennium Development Goal is within the 95 percent confidence interval. For the series starting in 1984, it can only be said with about 90 percent confidence that the aggregate trend exceeds the critical value needed to halve the 1990 poverty rate.

Poverty Gap Indices

The poverty gap index, PG , is related to the headcount index, H , as $PG=(1 - MP)H$, where MP is the ratio of the mean income of the poor to the poverty line. Regional rankings for the poverty gap index (table 6) are the same as those for the headcount index (see table 3), and they follow the same change in patterns over time.

Table 6. Poverty Gap Indices by Region for Two International Poverty Lines, 1981–2001 (%)

| <i>Poverty line and region</i> | 1981 | 1984 | 1987 | 1990 | 1993 | 1996 | 1999 | 2001 |
|------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| <i>\$1.08 a day (1993 PPP)</i> | | | | | | | | |
| East Asia | 20.58 | 11.11 | 7.69 | 7.65 | 6.13 | 3.52 | 3.57 | 3.35 |
| China | 23.41 | 11.82 | 8.17 | 8.87 | 7.34 | 3.82 | 4.18 | 3.94 |
| Eastern Europe and Central Asia | 0.18 | 0.14 | 0.11 | 0.11 | 0.84 | 1.25 | 1.86 | 0.75 |
| Latin America and Caribbean | 2.75 | 3.45 | 3.36 | 3.57 | 3.52 | 2.36 | 4.03 | 3.36 |
| Middle East and North Africa | 1.00 | 0.76 | 0.61 | 0.49 | 0.27 | 0.39 | 0.53 | 0.45 |
| South Asia | 16.06 | 13.86 | 12.35 | 11.00 | 10.21 | 8.97 | 6.63 | 6.37 |
| India | 17.27 | 14.99 | 12.68 | 11.09 | 10.86 | 10.55 | 7.22 | 7.08 |
| Sub-Saharan Africa | 17.03 | 19.65 | 20.10 | 19.07 | 19.24 | 19.80 | 20.10 | 20.53 |
| Total | 13.92 | 10.20 | 8.64 | 8.23 | 7.62 | 6.44 | 6.20 | 5.99 |
| <i>\$2.15 a day (1993 PPP)</i> | | | | | | | | |
| East Asia | 47.20 | 36.45 | 29.36 | 30.55 | 27.22 | 19.95 | 18.94 | 17.78 |
| China | 50.82 | 37.92 | 29.67 | 32.94 | 29.85 | 20.33 | 19.79 | 18.44 |
| Eastern Europe and Central Asia | 1.43 | 1.16 | 0.87 | 1.35 | 5.49 | 7.06 | 8.25 | 5.87 |
| Latin America and Caribbean | 10.66 | 12.44 | 11.48 | 11.81 | 12.04 | 9.25 | 10.97 | 10.20 |
| Middle East and North Africa | 8.81 | 7.36 | 6.80 | 5.69 | 5.05 | 5.74 | 6.54 | 6.14 |
| South Asia | 45.78 | 43.02 | 41.86 | 39.92 | 38.84 | 36.52 | 32.98 | 32.35 |
| India | 47.22 | 44.68 | 42.52 | 40.43 | 40.10 | 39.93 | 34.89 | 34.43 |
| Sub-Saharan Africa | 38.54 | 41.77 | 42.14 | 40.77 | 40.53 | 41.24 | 41.79 | 41.42 |
| Total | 35.02 | 30.79 | 27.86 | 27.80 | 26.82 | 23.76 | 23.05 | 22.20 |

Source: Authors' calculations based on national household survey data.

The most striking finding for the regional poverty gap indices is the depth of poverty in Africa, which has a \$1 a day poverty gap index of 20 percent compared with 6 percent for the developing world as a whole. Furthermore, the mean income of Africa's poor has been falling over time, dropping from \$0.64 per person per day in 1981 to \$0.60 in 2001 for the \$1 a day poverty line, though remaining roughly constant for the \$2 a day line (table 7). In the rest of the world poverty became shallower. The mean income of the poor in the developing world as a whole rose for the \$1 a day poverty line from about \$0.70 in 1981 to \$0.77 in 2001 and even more markedly for the \$2 a day line, from \$1.02 to \$1.25.

The fact that the mean income of the poor is lowest in Africa implies that unless inequality falls sufficiently, it will take more growth in Africa than in other regions

Table 7. Mean Daily Income of the Poor by Region for Two International Poverty Lines, 1981–2001 (1993 PPP\$)

| Poverty line and region | 1981 | 1984 | 1987 | 1990 | 1993 | 1996 | 1999 | 2001 |
|---------------------------------|------|------|------|------|------|------|------|------|
| \$1.08 a day (1993 PPP) | | | | | | | | |
| East Asia | 0.69 | 0.77 | 0.78 | 0.80 | 0.81 | 0.85 | 0.83 | 0.83 |
| China | 0.68 | 0.77 | 0.77 | 0.79 | 0.80 | 0.84 | 0.82 | 0.82 |
| Eastern Europe and Central Asia | 0.81 | 0.80 | 0.76 | 0.85 | 0.83 | 0.76 | 0.76 | 0.91 |
| Latin America and Caribbean | 0.77 | 0.76 | 0.74 | 0.73 | 0.74 | 0.84 | 0.66 | 0.70 |
| Middle East and North Africa | 0.86 | 0.86 | 0.87 | 0.85 | 0.89 | 0.87 | 0.86 | 0.87 |
| South Asia | 0.74 | 0.76 | 0.78 | 0.79 | 0.80 | 0.81 | 0.85 | 0.86 |
| India | 0.73 | 0.75 | 0.78 | 0.79 | 0.80 | 0.81 | 0.86 | 0.86 |
| Sub-Saharan Africa | 0.64 | 0.62 | 0.61 | 0.62 | 0.61 | 0.61 | 0.60 | 0.60 |
| Total | 0.70 | 0.74 | 0.75 | 0.76 | 0.76 | 0.77 | 0.77 | 0.77 |
| \$2.15 a day (1993 PPP) | | | | | | | | |
| East Asia | 0.95 | 1.13 | 1.22 | 1.21 | 1.25 | 1.35 | 1.34 | 1.35 |
| China | 0.91 | 1.11 | 1.21 | 1.18 | 1.21 | 1.33 | 1.30 | 1.30 |
| Eastern Europe and Central Asia | 1.50 | 1.55 | 1.57 | 1.56 | 1.47 | 1.42 | 1.41 | 1.51 |
| Latin America and Caribbean | 1.30 | 1.27 | 1.26 | 1.26 | 1.27 | 1.33 | 1.21 | 1.26 |
| Middle East and North Africa | 1.50 | 1.52 | 1.55 | 1.58 | 1.61 | 1.60 | 1.57 | 1.58 |
| South Asia | 1.05 | 1.09 | 1.11 | 1.15 | 1.16 | 1.19 | 1.24 | 1.25 |
| India | 1.02 | 1.06 | 1.10 | 1.14 | 1.15 | 1.14 | 1.22 | 1.23 |
| Sub-Saharan Africa | 1.02 | 0.97 | 0.96 | 0.98 | 0.98 | 0.97 | 0.97 | 0.99 |
| Total | 1.02 | 1.11 | 1.15 | 1.17 | 1.19 | 1.23 | 1.24 | 1.25 |

Source: Authors' calculations based on national household survey data.

to have the same proportionate impact on the poverty gap. This is borne out by calculations of the elasticities of the poverty gap index to growth in the mean, holding inequality constant (so that all levels of income grow at the same rate). The higher the mean income of the poor, the higher is the absolute elasticity of the poverty gap index to the overall mean. (It is readily verified that when all levels of income grow at the same rate, the elasticity of the poverty gap index to the overall mean is $-MP/[1 - MP]$.) Thus although this elasticity for the \$1 a day poverty line in 2001 is -1.3 for Sub-Saharan Africa, it is -1.8 for Latin America and the Caribbean, -3.3 for East Asia (-3.2 for China), -3.7 for Eastern Europe and Central Asia, -3.9 in South Asia, and -4.3 for the Middle East and North Africa (though this is deceptive, because proportionately fewer people live below the \$1 a day line; elasticity falls to -2.8 for the \$2 a day line). The elasticity is -2.5 for the developing world overall. The elasticity has fallen (in absolute value) over time in Africa, though only slightly (from -1.4 in 1981), while rising in the developing world as a whole (from -1.9 in 1981).

Relative Poverty

The absolute poverty measures examined so far aim to treat the same consumption level the same way no matter what country a person lives in. To see how the results might be affected by making an allowance for relative deprivation, poverty is estimated based on the relative poverty lines described above (table 8 and figure 4).

As expected, the incidence of relative poverty is noticeably higher for Eastern Europe and Central Asia, Latin America, and the Middle East and North Africa. By this measure Latin America overtakes South Asia in the early 1990s, making it the second poorest region. And Eastern Europe and Central Asia overtakes East Asia by

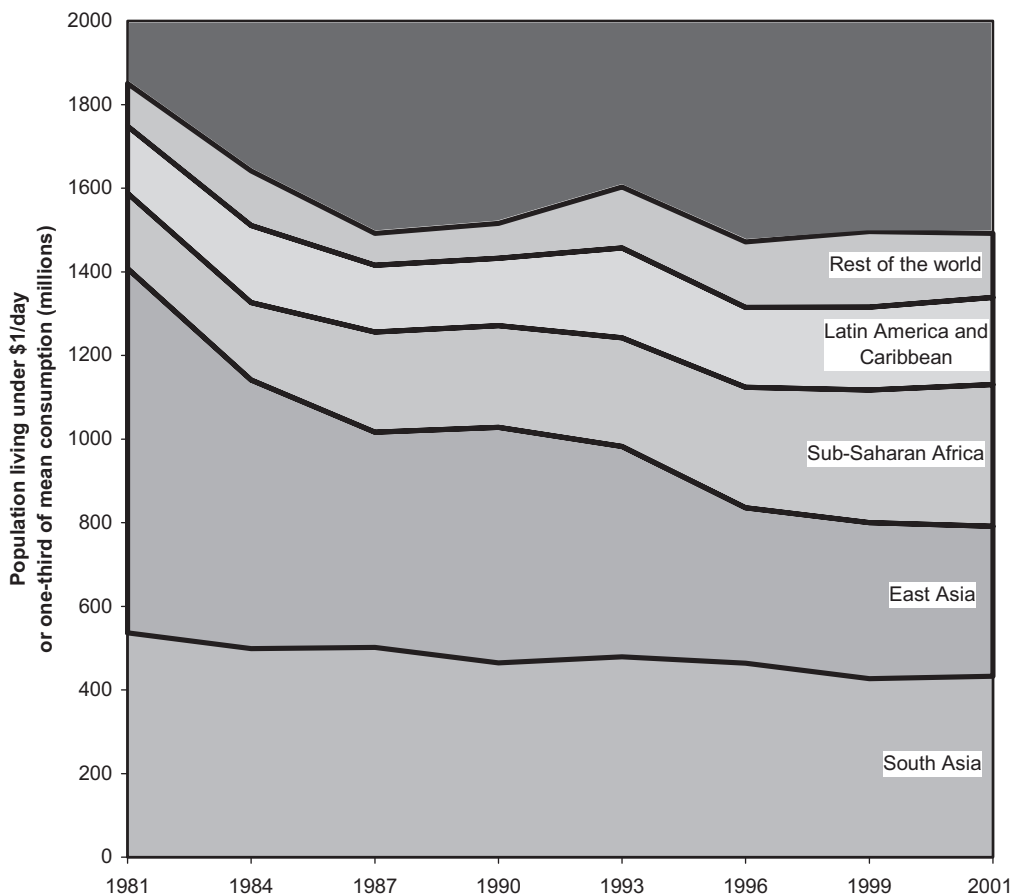
Table 8. Relative Poverty Measures by Region, 1981–2001

| Region | 1981 | 1984 | 1987 | 1990 | 1993 | 1996 | 1999 | 2001 |
|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Headcount index (%) | | | | | | | | |
| East Asia | 63.15 | 44.45 | 33.92 | 35.31 | 30.17 | 21.48 | 20.86 | 19.69 |
| China | 63.76 | 41.01 | 28.45 | 33.01 | 28.36 | 17.38 | 17.77 | 16.64 |
| Eastern Europe and Central Asia | 8.11 | 7.53 | 6.41 | 7.77 | 22.65 | 23.17 | 27.17 | 21.49 |
| Latin America and Caribbean | 40.55 | 45.37 | 42.34 | 43.28 | 44.97 | 39.39 | 38.98 | 39.77 |
| Middle East and North Africa | 37.36 | 33.40 | 21.80 | 19.29 | 17.58 | 17.16 | 18.26 | 16.91 |
| South Asia | 58.17 | 50.65 | 47.72 | 41.45 | 40.33 | 36.87 | 32.09 | 31.41 |
| India | 62.55 | 54.50 | 49.43 | 42.07 | 42.31 | 42.25 | 35.33 | 34.70 |
| Sub-Saharan Africa | 45.93 | 50.48 | 51.27 | 47.61 | 47.56 | 48.71 | 49.66 | 50.18 |
| Total | 50.1 | 42.0 | 36.6 | 35.3 | 34.9 | 30.6 | 29.8 | 28.8 |
| Number of poor (millions) | | | | | | | | |
| East Asia | 871.3 | 642.9 | 515.2 | 563.7 | 502.6 | 371.4 | 373.1 | 358.8 |
| China | 633.7 | 425.2 | 308.4 | 374.8 | 334.2 | 211.6 | 222.8 | 211.6 |
| Eastern Europe and Central Asia | 34.9 | 33.3 | 29.2 | 36.2 | 106.8 | 109.6 | 128.9 | 102.0 |
| Latin America and Caribbean | 149.1 | 177.6 | 175.6 | 189.8 | 207.8 | 191.3 | 198.1 | 208.3 |
| Middle East and North Africa | 67.1 | 66.1 | 47.3 | 45.8 | 45.0 | 46.8 | 52.8 | 50.8 |
| South Asia | 536.2 | 498.6 | 501.4 | 464.5 | 479.4 | 464.1 | 426.9 | 432.8 |
| India | 439.6 | 408.6 | 394.8 | 357.4 | 380.0 | 399.5 | 352.4 | 358.6 |
| Sub-Saharan Africa | 180.5 | 216.4 | 239.3 | 242.2 | 261.6 | 290.0 | 319.5 | 338.2 |
| Total | 1839.2 | 1634.9 | 1508.0 | 1542.1 | 1603.2 | 1473.2 | 1499.4 | 1490.8 |

Note: The relative poverty line is \$1.08 or one-third of mean consumption, whichever is larger.

Source: Authors' calculations based on national household survey data.

Figure 4. Number of Poor People by Region for a Relative Poverty Line, 1981–2001



Note: The relative poverty line is \$1.08 a day or one-third of mean consumption, whichever is larger.
Source: Authors' calculations based on national household survey data.

the mid-1990s. Although there are marked changes in regional rankings, the aggregate trends over time are quite similar. (This is at least in part a consequence of the fact that the relative poverty lines are absolute over time.) The incidence of relative poverty in the developing world as a whole is 29 percent in 2001, down from 50 percent in 1981. By this measure the total number of poor people is 1.5 billion in 2001. The total number of poor people by the relative poverty measure has shown no trend decline since the mid-1980s. Excluding China, the number of relatively poor people has remained at around 1.2 billion, though showing a slight upward trend in the 1990s.

Conclusions

In providing new estimates of the extent of poverty in the developing world over 1981–2001, we have followed previous practice in focusing primarily on an international poverty line that accords with poverty lines typical of the poorest countries. We used a poverty line of about \$1 a day, though we also considered a line set at twice this value, as well as a relative poverty line that rises with average consumption when it exceeds about \$3 a day. The estimates drew on newly available household surveys, and all past estimates have been revised in the light of the new data. Our estimates appear to be more internally consistent and comparable over time than past estimates, including those of World Bank (2002), which argued that there were 200 million fewer poor at the end of twentieth century than 20 years earlier.

We find that the 200 million figure is an underestimate and that the reduction in the number of poor people in the world was almost twice that size, entailing a near halving of the 1981 poverty rate of 40 percent by 2001.

The precise time period covered is crucial, however. Progress against extreme poverty has been uneven over time. The most dramatic reduction in poverty was in the early 1980s; about half of the 390 million drop in the \$1 a day poverty count between 1981 and 2001 occurred in the first three years of that period. This coincided with the sharp drop in extreme poverty in China in the aftermath of the reforms that abandoned the socialist mode of agricultural production in favor of household-based farming. In contrast, during 1987–93 the number of people living on less than \$1 a day stayed roughly constant, at around 1.2 billion. There was more progress in the 1990s, once growth had been restored in the most populous countries, China and India. There were 100 million fewer poor people by the \$1 a day standard at the end of the 1990s than at the beginning. For assessing overall trends, we argue that the focus should be on the period 1984–2001.

Although the overall picture is good news, it is no cause for complacency. The 390 million fewer poor people by the \$1 a day poverty line over 1981–2001 are still poor by the standards of middle-income developing economies and certainly very poor by the standards of what poverty means in rich countries. Our estimates indicate that the number of people living on less than \$2 a day has risen. Clearly, a great many people remain poor and vulnerable to aggregate economic slowdowns.

Nor has this aggregate progress for the poorest over the 1980s and 1990s been shared by all regions. The dramatic progress against poverty in the early 1980s owes much to China. If one focuses on the developing world outside China, the number of poor people by the \$1 a day standard has changed little—indeed, it has risen slightly.

The composition of world poverty has changed dramatically. The number of poor people has fallen in Asia but risen elsewhere. The share of the world's poor people living in Africa has risen appreciably. Not only has Africa emerged in the 1990s as

the region with the highest incidence of poverty, but the depth of poverty is also markedly higher than in other regions—suggesting that future economic growth will have a harder time reducing poverty in Africa than elsewhere unless inequality falls.

If the trend rate of decline in the incidence of poverty by the \$1 a day standard over 1984–2001 is maintained over 2001–15, it will be sufficient to halve the 1990 aggregate headcount index by 2015, consistent with the Millennium Development Goal. However, only one part of the world—East and South Asia—will have reached the goal.

Appendix: Survey Data Sets by Country, Date, and Welfare Indicator

| <i>Region</i> | <i>Share of 2001 population represented (%)</i> | <i>Country</i> | <i>Survey dates</i> | <i>Welfare indicator</i> | | |
|---------------|---|---------------------------------|--|--|-------------|-------------|
| East Asia | 96.11 | Cambodia | 1997 | Expenditure | | |
| | | China | 1980, 1981, 1984, 1985, 1987, 1990 | Income | | |
| | | | 1990, 1992, 1993, 1996, 1999, 2001 | Expenditure | | |
| | | Indonesia | 1981, 1984, 1987, 1990, 1993, 1996, 1999, 2002 | Expenditure | | |
| | | | Lao PDR | 1992, 1997 | Expenditure | |
| | | Malaysia | 1984, 1987, 1989, 1992, 1995, 1997 | Income | | |
| | | | Mongolia | 1995, 1998 | Expenditure | |
| | | Philippines | 1985, 1988, 1991, 1994, 1997, 2000 | Expenditure | | |
| | | | Thailand | 1981, 1988 | Income | |
| | | | | 1988, 1992, 1996, 1998, 1999, 2000, 2002 | Expenditure | |
| | | Vietnam | 1992/93, 1998 | Expenditure | | |
| | | Eastern Europe and Central Asia | 97.32 | Albania | 1997, 2002 | Expenditure |
| | | | | Armenia | 1988, 1996 | Income |
| 1996, 1998 | Expenditure | | | | | |
| Azerbaijan | 1988 | | | Income | | |
| | 1995, 2001 | | | Expenditure | | |
| Belarus | 1988, 1993, 1995, 1998, 1999 | | | Income | | |
| | 1996–2000 | | | Expenditure | | |

(Continued)

Table A.1. (Continued)

| <i>Region</i> | <i>Share of 2001 population represented (%)</i> | <i>Country</i> | <i>Survey dates</i> | <i>Welfare indicator</i> |
|------------------------------------|---|--------------------|---|--------------------------|
| | | Bulgaria | 1989, 1992, 1994, 1995, 1997, 2001 | Expenditure |
| | | | 1993, 1996 | Income |
| | | Croatia | 1998, 1999, 2000, 2001 | Expenditure |
| | | | 1988, 1998 | Income |
| | | Czech Republic | 1988, 1993, 1996 | Income |
| | | Estonia | 1988, 1993, 1995, 1998 | Income |
| | | Georgia | 1989, 1996, 1997 | Income |
| | | | 1996, 1998–2001 | Expenditure |
| | | Hungary | 1989, 1993–1996, 1998 | Income |
| | | Kazakhstan | 1988, 1993 | Income |
| | | | 1993, 1996, 2000 | Expenditure |
| | | Kyrgyz Republic | 1988, 1993, 1996, 1998 | Income |
| | | | 1993, 1997–2001 | Expenditure |
| | | Latvia | 1988, 1993, 1995, 1998 | Income |
| | | Lithuania | 1988, 1993, 1994, 1996, 2000 | Income |
| | | | 1996, 1998, 2000 | Expenditure |
| | | Macedonia | 1988 | Income |
| | | | 1998 | Expenditure |
| | | Moldova | 1988, 1992, 1997 | Income |
| | | | 1997–2001 | Expenditure |
| | | Poland | 1985, 1987, 1989, 1993, 1998 | Income |
| | | | 1990, 1992, 1993–96 | Expenditure |
| | | Romania | 1989, 1992, 1994 | Income |
| | | | 1998, 2000 | Expenditure |
| | | Russian Federation | 1988, 1993 | Income |
| | | | 1993, 1996, 1998, 2000 | Expenditure |
| | | Slovak Republic | 1988, 1992, 1996 | Income |
| | | Slovenia | 1987, 1993, 1996, 1998 | Income |
| | | Tajikistan | 1998 | Expenditure |
| | | Turkey | 1987, 1994, 2000 | Expenditure |
| | | Turkmenistan | 1988, 1993, 1998 | Income |
| | | Ukraine | 1988, 1992, 1997 | Income |
| | | | 1995, 1996, 1999 | Expenditure |
| | | Uzbekistan | 1988, 1993 | Income |
| | | | 1998, 2000 | Expenditure |
| Latin America and the Caribbean | 95.31 | Argentina | 1980, 1982, 1989, 1992, 1996, 1998, 2001 | Income |
| | | Bolivia | 1986, 1990, 1997, 1999 | Income |

Table A.1. (Continued)

| <i>Region</i> | <i>Share of 2001 population represented (%)</i> | <i>Country</i> | <i>Survey dates</i> | <i>Welfare indicator</i> |
|------------------------------|---|---------------------|--|--------------------------|
| | | Brazil | 1981, 1984, 1985, 1987, 1988–89, 1990, 1993, 1995–98, 2001 | Income |
| | | Chile | 1987, 1990, 1992, 1994, 1996, 1998, 2001 | Income |
| | | Colombia | 1980, 1988, 1989, 1991, 1995–96, 1998–1999 | Income |
| | | Costa Rica | 1981, 1986, 1989, 1990, 1993, 1996–1998, 2001 | Income |
| | | Dominican Republic | 1986, 1989, 1992, 1996, 1998 | Income |
| | | Ecuador | 1988, 1994–95, 1998 | Income |
| | | | 1994–95 | Expenditure |
| | | El Salvador | 1989, 1995–98, 2000 | Income |
| | | Guatemala | 1986, 1989, 1998, 2000 | Income |
| | | Guyana | 1993, 1998 | Expenditure |
| | | Honduras | 1986, 1989–90, 1992, 1994, 1996–1999 | Income |
| | | Jamaica | 1988–94, 1996–2000 | Expenditure |
| | | Mexico | 1984, 1992, 2000 | Expenditure |
| | | | 1989, 1995, 1996, 1998 | Income |
| | | Nicaragua | 1993, 1998 | Expenditure |
| | | Panama | 1979, 1989, 1991, 1995–98, 2000 | Income |
| | | Paraguay | 1990, 1995, 1997–1999 | Income |
| | | Peru | 1985, 1994, 1996 | Expenditure |
| | | | 1994, 1996, 2000 | Income |
| | | St. Lucia | 1995 | Income |
| | | Trinidad and Tobago | 1988, 1992 | Income |
| | | Uruguay | 1981, 1989, 1996–1998, 2000 | Income |
| | | Venezuela | 1981, 1987, 1989, 1991, 1993, 1995–98 | Income |
| Middle East and North Africa | 74.05 | Algeria | 1988, 1995 | Expenditure |
| | | Egypt, Arab Rep. | 1991, 1995, 2000 | Expenditure |
| | | Iran | 1986, 1990, 1994, 1998 | Expenditure |
| | | Jordan | 1987, 1992, 1997 | Expenditure |
| | | Morocco | 1985, 1990, 1998/99 | Expenditure |
| | | Tunisia | 1985, 1990, 1995, 2000 | Expenditure |
| | | Yemen | 1992, 1998 | Expenditure |

(Continued)

Table A.1. (Continued)

| <i>Region</i> | <i>Share of 2001 population represented (%)</i> | <i>Country</i> | <i>Survey dates</i> | <i>Welfare indicator</i> |
|--------------------------|---|--------------------|---|--------------------------|
| South Asia | 98.09 | Bangladesh | 1983/84, 1984–85, 1988, 1992, 1996, 2000 | Expenditure |
| | | India | 1977/78, 1983, 1986–91, 1993/94, 1995/96, 1999/2000 | Expenditure |
| | | Nepal | 1985, 1995 | Expenditure |
| | | Pakistan | 1986/87, 1990/91, 1992/93, 1996/97, 1998 | Expenditure |
| | | Sri Lanka | 1980, 1985, 1990, 1995 | Expenditure |
| | | Sub-Saharan Africa | 77.86 | Botswana |
| Burkina Faso | 1994, 1998 | Expenditure | | |
| Burundi | 1992, 1998 | Expenditure | | |
| Cameroon | 1996 | Expenditure | | |
| Central African Republic | 1993 | Expenditure | | |
| Côte d'Ivoire | 1985–88, 1993, 1995, 1998 | Expenditure | | |
| Ethiopia | 1981, 1995, 2000 | Expenditure | | |
| Gambia, The | 1992, 1998 | Expenditure | | |
| Ghana | 1987, 1989, 1998 | Expenditure | | |
| Kenya | 1992, 1994, 1997 | Expenditure | | |
| Lesotho | 1986, 1993, 1995 | Expenditure | | |
| Madagascar | 1980, 1993, 1999 | Expenditure | | |
| Mali | 1989, 1994 | Expenditure | | |
| Malawi | 1997 | Expenditure | | |
| Mauritania | 1988, 1993, 1995, 2000 | Expenditure | | |
| Mozambique | 1996/97 | Expenditure | | |
| Namibia | 1993 | 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, 1995, 2000 | Expenditure | | |
| Swaziland | 1994 | Expenditure | | |
| Tanzania | 1991 | Expenditure | | |
| Uganda | 1988, 1992, 1996, 1999 | Expenditure | | |
| Zambia | 1991, 1993, 1996, 1998 | Expenditure | | |
| Zimbabwe | 1990/91, 1995 | Expenditure | | |

Source: National household surveys.

Notes

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1. Wade (2004) also questions the 200 million figure. However, he misdiagnoses the problem by confusing changes in the methods used to count the world's poor people with the methodological issues related to the way World Bank (2002) used different data sources. In fact, the Chen and Ravallion estimates used in World Bank (2002) would be judged internally consistent by Wade's criteria. The Deaton critique is more persuasive because it is grounded on a well-researched understanding of the methods involved.

2. For a critical overview of our estimation methods, see Deaton (2002a), which covers the main issues raised in the literature. Ravallion (2002a) replies to Deaton's comments; also see Ravallion (2003a) for further discussion.

3. The latest individual country estimates can be found online at www.worldbank.org/research/povmonitor. The latest year's estimates at the country level are also published in the World Bank's *World Development Indicators* (see, for example, World Bank 2004).

4. Because we are using the same PPP rates as Chen and Ravallion (2001), we use Penn World Tables 5.6, which was the latest available at that time. Version 6.1 has since become available.

5. Thus we do not accept the claims made by Reddy and Pogge (2002) and Wade (2004) that we have lowered the real value of the poverty line. They ignore the fact that there has been (in effect) a PPP devaluation of poor countries relative to the United States since the switch from the 1985- to 1993-based PPPs, reflecting both the new ICP price data and differences in methods of measuring the PPP rate. For further discussion of the Reddy and Pogge criticisms of our methods see Ravallion (2002b).

6. Note that the same poverty line is generally used for urban and rural areas. There are two exceptions. For China and India we estimate poverty measures separately for urban and rural areas and use sector-specific CPIS. For India we also use a corrected version of the rural CPI (the consumer price index for agricultural laborers), as discussed in Datt and Ravallion (1998).

7. For Nigeria we used the GDP per capita growth rate. Substantial changes in Nigeria's method of calculating private consumption made it impossible to construct a consistent series for consumption.

8. Thus $H93 = [(1995 - 1993) / (1995 - 1989)] \cdot H93(89) + [(1993 - 1989) / (1995 - 1989)] \cdot H93(95)$. In a small number of cases this method did not give sensible results in that either $M93(89)$ or $M93(95)$ was outside the interval $[M(89), M(95)]$ even though the national accounts growth rates were positive for both 1989-93 and 1993-95. In these cases we ignored the national accounts data and fell back on simply estimating $M(93)$, using the growth rate in survey means between 1989 and 1995.

9. This assumes that the trend is linear rather than exponential (linear in logs). The exponential trends are 2.9 percent a year using all eight years and 2.5 percent a year ignoring the first year.

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