

### ■ global income inequality

Prevailing concerns about economic inequity in the world reflect many aspects of living standards and how they are distributed, and no single measure can hope to capture all those concerns. As conventionally measured, “inequality” and “poverty” are quite different aspects of income distribution, in that the former focuses on the (absolute or relative) disparities in income (or consumption), while the latter focuses on absolute levels of deprivation, which depend on the average levels of living in society as well as inequality.

Both poverty and inequality are closely related to a third concept, “social welfare,” which aggregates welfare levels, which are taken to depend, at least in part, on income. (Differences in “income needs” may also play a role.) Poverty and social welfare are both sensitive to income changes at the bottom of the distribution: if everything else is held constant, as poverty rises, social welfare falls. They differ, however, in that standard measures of social welfare are also sensitive to changes at the top of the income ladder, whereas poverty measures typically are not. Inequality also relates to social welfare, since most social welfare functions have curvature properties that penalize higher inequality at any given mean income (Atkinson 1970).

Well-being itself has many dimensions, of course, and interpersonal aggregation is fraught with difficulties. Some people argue that the standard of living should be assessed in terms of capabilities—the set of “beings and doings” one is capable of enjoying—rather than income or consumption (see, for example, Sen 1985). This can be interpreted as an issue of how best to deal with interpersonal heterogeneity in income “needs.”

There is not enough room in this entry to do justice to all these issues. The focus here is on global consumption and income distribution, and how they are changing.

**Concepts, Methods, and Data** Conceptual and methodological differences lie at the root of the ongoing debates about global inequality. There are significant differences in four main areas: the welfare indicator (“inequality of what?”), the definition of

the distribution, the choice of inequality measure, and the appropriate data sources. Without some understanding of these differences, it is impossible to take an informed position in this debate.

*Inequality of What?* Standard practice has been to rank households by consumption or income per person. The consumption or income numbers that can be formed from most nationally representative large household surveys are reasonably comprehensive, in that they span the commodity space or all income sources (with imputed value for income in kind from production for one’s own use or consumption). But they can hardly be considered complete metrics of welfare; access to subsidized health care or schooling is generally excluded, for example. Hence it is important to also look separately at key “nonincome” dimensions of welfare that capture the missing components. We will return to this topic, but for now we focus on the standard consumption or income measures available from surveys.

The choice between consumption and income is not a minor one, since inequality is generally lower for consumption than for income, due to consumption smoothing (whereby savings or borrowing are used to assure that living standards do not vary as much over time as incomes do). The consensus in the development literature is that consumption is both the conceptually preferable measure—given some degree of smoothing in the presence of intertemporal income variability—and more accurately measured in surveys. (Against this view, however, some scholars have argued that income may better reflect opportunities for consumption.)

The near-universal normalization by household size is also questionable. For example, it does not allow for economies of size in consumption (whereby two people can live more cheaply together than apart), and doing so can affect inequality and poverty comparisons, such as the claims often heard that larger households are poorer (Lanjouw and Ravallion 1995).

Naturally, household surveys measure expenditures in local currencies, which then have to be converted to a single currency. The basic choice is between market exchange rates, which measure in-

ternational purchasing power in terms of traded goods, and purchasing power parity (PPP) exchange rates, which adjust for the fact that nontraded goods tend to be cheaper in poorer countries. Almost all researchers prefer PPPs, although there is more than one way to measure PPP exchange rates. The Geary-Khamis (GK) method used by the Penn World Tables (PWT) underestimates global inequality since the quantity weights used to compute the international price indexes give greater weight to consumption patterns in richer countries, which in turn results in an overestimate of expenditures in poorer countries. The Eltöte, Köves, and Szulc (EKS) method, which is the multilateral extension of the bilateral Fisher index, attempts to correct for this bias. (On the differences between the GK and EKS methods and implications for global poverty measures, see Ackland, Dowrick, and Freyens 2006. Since 2000, the World Bank's global poverty and inequality measures have been based on the Bank's PPPs, which use the EKS method.)

Although these are all difficult measurement issues, the main sources of the differences in existing numbers on the evolution of global poverty and inequality lie elsewhere.

*What Distribution?* There are three main—and very different—ways of defining the “world income distribution.” The first is the distribution of country mean incomes, unweighted by population; we call this the “intercountry income distribution.” This is of interest primarily to those who view the country, rather than the individual, as the main unit of interest. If gross domestic product (GDP) per capita is used as a measure of the country mean income, this concept corresponds closely to the macroeconomic literature on testing for international income convergence (see, e.g., Quah 1996; Pritchett 1997). The second distribution is that of country means, weighted by population—the “international income distribution.” This places higher weight on more populous countries.

The third definition focuses on the distribution of *individual* incomes, across all people in the world. This is the “global income distribution,” and for those concerned with the individual—rather than

the country—as the fundamental unit of analysis, this third concept is clearly preferable. If inequality between rich Chinese (or Americans) and poor Chinese (or Americans) is rising, why should this not be counted as part of world inequality? The earlier literature focused on intercountry and international inequalities largely for data availability reasons. It is only since about the mid-1980s that household survey data have become available for a sufficient number of countries so as to enable a computation of global inequality. (These three measures—intercountry, international, and global—correspond, respectively, to inequality concepts 1, 2, and 3, as defined by Milanovic 2005. For decomposable measures, international income inequality corresponds to the between-country component of global inequality.)

*What measure?* A key conceptual distinction—too often ignored in applied work—is between *relative* and *absolute* measures of inequality. We consider relative measures first. One of the most popular inequality measures is the Gini index, which is constructed by summing income differences, expressed as a ratio to the mean, across all individuals in a population and then dividing it by the number of people. This measure has an intuitive interpretation: if two individuals are drawn at random, then the expected difference in their incomes, normalized by the mean, will be equal to twice the Gini index. The index can also be depicted graphically. If one orders the population from poorest to richest, and graphs the cumulative income share against the cumulative population share of each percentile (thereby obtaining the “Lorenz curve”), then the Gini index is twice the area between the Lorenz curve and the diagonal. There are many other inequality measures; a good overview can be found in Cowell (2000). Another popular measure is the mean log deviation, given by the average proportionate gap between mean income and actual income; this measure has some attractive properties, including decomposability into (population-weighted) between-group and within-group components (Bourguignon 1979).

These measures of inequality are designed to be *scale-invariant*, meaning that they do not change if

every income in the distribution is multiplied by a positive constant. The resulting measure then depends solely on income *ratios*, in contrast to absolute measures, which depend on the absolute *differences* in incomes. If every person becomes 10 percent richer, then a relative measure of inequality does not change, even though the (absolute) gains to the rich are many times larger than those to the poor.

Many commentators on globalization appear to focus on absolute income differences rather than relativities. Being sensitive to differences rather than ratios, an absolute inequality measure would increase in our hypothetical scenario of a 10 percent rise in everyone's incomes. Though not often used in practice, an absolute version of the Gini index can be constructed by dropping the normalization of income differences by the mean, so that the measure is one-half of the mean difference in incomes of pairs of individuals.

It may well be the case that much of the debate about what is happening to inequality in the world is actually a debate about whether one thinks about "inequality" in relative or absolute terms (Ravallion 2004). Yet the choice between absolute and relative inequality measures is not a matter of right or wrong. They correspond to different procedures for aggregating gaps between incomes, and thus to different normative concepts of inequality. (Ravallion 2004 discusses this issue further and the implications of other conceptual distinctions, such as between vertical and horizontal inequality, for one's assessment of the impact of globalization on inequality.)

Other observers in the globalization debate focus more on absolute levels of living of the poor, rather than the gaps (whether absolute or relative) between the rich and poor. The measures of poverty found in practice reflect the absolute consumption or income shortfalls from some agreed minimum standard, the poverty line, which aims to have the same real value over time and (when relevant) space. Suppose again that all incomes increase by 10 percent. Relative inequality will remain the same and absolute inequality will have risen. But the incidence of absolute poverty will have fallen, reflecting the higher living standards of the poor. Although this entry focuses

mainly on global inequality, this would give an incomplete picture if we did not also look at what has been happening to global poverty.

*What data sources?* One might have guessed that there was general agreement on data sources, but that is not the case, and the choices made do matter. There are essentially two approaches. The first relies on secondary data sources, from existing data compilations such as the World Bank's *World Development Indicators*, and the second relies more heavily on primary sources, including unit-record data from household surveys.

A number of studies have used quintile shares or inequality measures derived from various inequality data bases as estimates of inequality in each individual country (examples include Bhalla 2002; Sala-i-Martin 2006). These shares are often derived from already grouped data (rather than from microdata), and they refer to different welfare concepts (income or consumption) and different recipient units (households or individuals). In order to increase the data coverage, the quintiles are pooled together without due attention to their comparability.

Another data issue is the choice between using national accounts (NAS) versus household survey means as the appropriate mean for the distribution. While GDP per capita numbers computed from NAS were traditionally used to construct inter-country and international distributions, household surveys have been the traditional tool for measuring poverty and inequality. The aggregates from these sources generally do *not* agree, and that is hardly surprising when one probes the way the numbers are generated. It seems that over relatively long time periods the two data sources tend to converge to a common ratio in most countries, but the remaining difference in levels can be sizable, and there are some notable short-term divergences (as documented by Ravallion 2003 and Deaton 2005).

Whether using quintile estimates from secondary data or original microdata, some authors rescale individual incomes in each country so as to have a mean corresponding to GDP per capita (from the NAS). They often argue that surveys do not capture a number of determinants of welfare, such as publicly

provided goods. They also worry about income underreporting in these surveys.

There are problems with this rescaling method. On the one hand, it is not clear that the NAS data can provide a more accurate measure of mean *household* welfare than the survey data that were collected precisely for that purpose. On the other hand, even acknowledging the problems of income underreporting and selective survey compliance, there can be no presumption that the discrepancies with the NAS are distribution neutral; more plausibly, the main reasons why surveys underestimate consumption or income would also lead to an underestimation of inequality. For example, Banerjee and Piketty (2005) attribute up to 40 percent of the difference between the (higher) growth of GDP per capita and (lower) growth of mean household per capita consumption from household surveys in India to unreported increases in the incomes of the rich. Selective compliance with random samples could well be an equally important source of bias, although the sign is theoretically ambiguous; Korinek, Mistiaen, and Ravallion (2006) provide evidence on the impact of selective nonresponse for the United States.

Nor are the NAS always reliable. For instance, global inequality results depend crucially on China, but China's GDP per capita numbers are the subject of intense debate. Maddison (2003) and, to a lesser extent, Penn World Tables give significantly higher values for China's GDP per capita in the 1950s and 1960s than the official Chinese statistics. The differences have important implications for the estimation of global inequality.

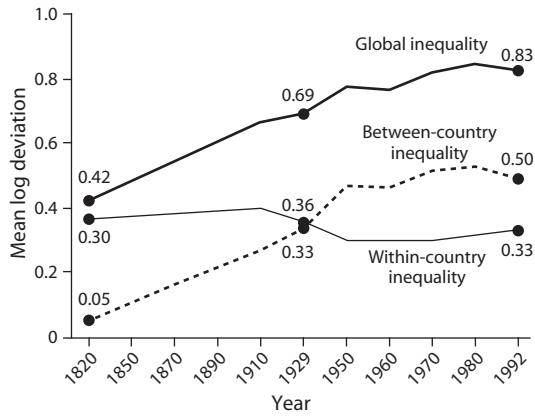
For these reasons, there is a growing recognition that adjustment of household survey data by the NAS mean is probably undesirable (Deaton 2005; Bourguignon and Morrisson 2002; Anand and Segal 2008). The best current practices in measuring global inequality and poverty increasingly rely, to the maximum extent feasible, on nationally representative household survey data.

**The Evolution of Global Inequality and Poverty** Acknowledging these conceptual, data, and methodological caveats, what can be said about trends in the world distribution of income?

Bourguignon and Morrisson (2002) constructed a time series of world inequality estimates for the period from 1820 to 1992. For all but the last ten to twenty years of that series, disaggregated household survey data are not available for a large number of countries. Countries were grouped into 33 blocks, with block composition changing over time, depending on data availability (for details, see Bourguignon and Morrisson 2002). The distributions are constructed in such a manner that all the members of a block are assumed to have the same distribution as a country for which distribution data are available. The authors construct a distribution based on decile (and some ventile) shares, and on GDP per capita figures. Individuals are assumed to have the same incomes within tenths (or twentieths) of the distribution, where that income corresponds to the group's share of GDP per capita. This hybrid of the concepts discussed in the previous section was the compromise that allowed the authors to construct a long time series covering most of the 19th and 20th centuries. Given the long-run perspective of this exercise, however, it is likely that some of the problems discussed in the previous section were only moderately important. In particular, the estimated evolution of GDP per capita over such a long period is likely to be very strongly correlated with any measure of household welfare.

The main finding of the study is that world inequality rose almost continuously from the onset of the industrial revolution until the First World War. During that period, the Gini coefficient rose from 0.50 to 0.61. Although inequality was also rising within most countries for which data were available, the real driving force for this increase in global disparity was inequality *between* countries, that is, international inequality (see figure 1).

Between the two World Wars, and until around 1950, a decline in within-country inequality was observed, but the rise in inequality across countries continued apace and proved to be the dominant force. The world Gini coefficient rose further to 0.64. From the middle of the 20th century on, the rise of global inequality slowed, as Japan and parts of East Asia started growing faster than Europe and North



**Figure 1** Inequality between and within countries. Source: Authors' manipulation of data from Bourguignon and Morrisson (2002).

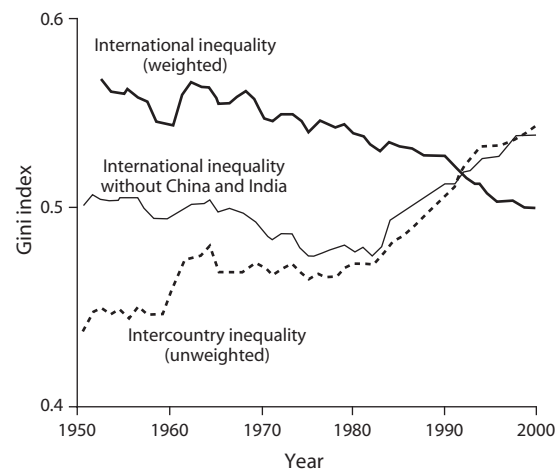
America. This process became particularly pronounced after the takeoff of China in the 1980s. Broadly speaking, global inequality changes in the second half of the 20th century were much less significant than in the previous 130 years: there was certainly a reduction in the growth of inequality and, toward the end of the period, inequality may have started to decline.

When considering the last decades of the 20th century, however, better and more comprehensive data are available. Household survey data coverage, and the data's availability to researchers, increased dramatically in the 1980s and 1990s, and it became possible to construct not only intercountry and international inequality series based on a broader set of countries, but also real global income distributions, from the microdata.

Looking at the second half of the 20th century with these data, Milanovic (2005) and World Bank (2006) highlight two interesting regularities. First, even as (unweighted) intercountry inequality continued to grow between 1950 and 2000, international inequality began to fall. The disparate behavior in these two inequality concepts has been one of the reasons behind disagreements on globalization and inequality. The continuing rise in intercountry inequality (to which Pritchett 1997 refers as "divergence, big time") was due largely to slow

growth in most poor (and small) countries, relative to some middle-income and richer countries. The decline in international inequality, which refers to a population-weighted distribution, was due fundamentally to rapid growth in two giant countries that started out very poor: China and, to a lesser extent, India. As figure 2 suggests, once China and India are excluded from the international distribution, the post-1980 trend in that inequality concept changes dramatically and becomes much closer to the rising trend in intercountry inequality.

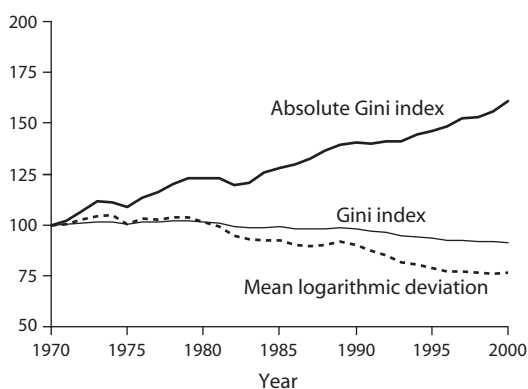
The second regularity is that the last two decades of the 20th century saw a resumption in the upward trajectory of within-country inequality, defined as the aggregate contribution of within-country inequality to total inequality. The rise in within-country inequality prevented the decline in international inequality (which began, slowly, around the 1960s) from translating immediately into a decline in global inequality. Recall that global inequality is the sum of (appropriately aggregated) within-country inequality and international inequality. Indeed, Milanovic (2002, 2005) finds that global income inequality between people was still rising between 1988 and 1993, but appears to have fallen between 1993 and 1998. This is confirmed by World Bank (2006), which extends Milanovic's data set by a couple of years.



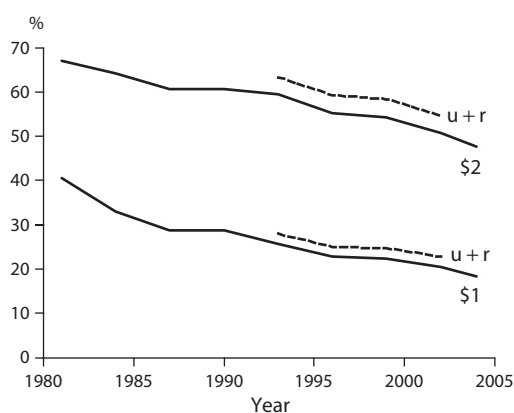
**Figure 2** Intercountry inequality and international inequality. Source: Milanovic (2005).

The foregoing discussion has been about relative inequality. What about the competing concept of absolute inequality, which depends on the absolute gaps in levels of living between the “rich” and the “poor”? As figure 3 shows, the two concepts give rise to completely different trends for international inequality: whereas all relative inequality measures shown fall from 1990 on, all absolute measures record substantial increases. The difference is practically as important when considering global inequality. It would slightly increase and plateau when defined in relative terms and increase drastically when defined in absolute terms.

Recall that none of these measures tell us directly about the absolute standard of living of poor people. Has rising inequality reflected falling living standards for the world’s poor? Using the longest available period of time with consistent series—1981–2004—the World Bank’s latest estimates (reported in Chen and Ravallion 2007) show that the poverty rate for the developing world as a whole fell from 40 percent in 1981 to 18 percent in 2001, judged by the \$1/day standard at PPP (figure 4). Here too measurement methods matter. Using secondary sources on inequality and NAS data on mean income, Sala-i-Martin (2006) finds that the global poverty rate fell from 13 percent in 1980 to 7 percent in 1998. By both methods, the poverty rate was almost halved over 1980–2000, although the levels are quite dif-



**Figure 3** Absolute and relative inequality in the world. Source: Atkinson and Brandolini (2004).



**Figure 4** Incidence of absolute poverty in the developing world. This figure gives the estimated percentage of the population of the developing world living below \$32.74 per month (“\$1 a day”) and \$65.48 per month (“\$2 a day”) at 1993 consumption PPP. The lines  $u + r$  give the corresponding percentages when one incorporates an allowance for the higher cost of living in urban areas. Source: Chen and Ravallion (2007).

ferent. However, GDP includes much more than household consumption, and it is not clear why one would use the same poverty line when switching from household consumption from surveys to GDP from national accounts. Sala-i-Martin’s estimates based on a \$2/day line—to allow for the non-household consumption share of GDP—accord quite closely with the World Bank’s estimates using \$1/day.

While there is broad agreement that the world is making progress against absolute poverty, there are some important regional exceptions, notably much of sub-Saharan Africa over the 1980s and 1990s. It is also notable that a sizable share of the overall progress has been due to the success against poverty of just one country, China (Chen and Ravallion 2007).

**Inequality in Other Dimensions** Although this entry (and the broader debate) has focused on income inequality trends, there should be no presumption that it is the only inequality that matters. Indeed, from some perspectives, international disparities in health status and educational achievement may matter just as much (in addition to being instrumentally important in shaping income inequality and poverty). Since around 1930 there has

been convergence in the intercountry and international distributions of life expectancy at birth (LEB). As mean world (weighted) LEB rose from 53.4 years in 1960 to 64.8 years in 2000, its distribution moved from bimodality to unimodality and the coefficient of variation fell from 0.233 to 0.194 (World Bank 2006). This heartening trend was partly reversed, however, during the 1990s, when LEB fell precipitously in some of the world's poorest countries, due largely to the spread of HIV/AIDS.

Educational inequality, measured by the distribution of years of schooling, has also fallen substantially since the 1960s. As mean years of schooling in the world rose from 3.4 in 1960 to 6.3 in 2000, the coefficient of variation fell from 0.739 to 0.461. (Note that inequality measures for variables like life expectancy or years of education have to be interpreted with care. Both variables are close to being bounded from above, and inequality tends to fall automatically when the mean increases.) This pattern of rising means and falling inequality in attainment was common to all regions of the world and, in addition, all regions also saw a reduction in gender disparities, as measured by the male to female schooling ratio (World Bank 2006).

Unfortunately, this reduction in *attainment* inequality has not always meant a reduction in the disparities in true educational *achievement*. Indeed, internationally comparable test score data suggest that these disparities remain strikingly large with, for example, the reading competence of the average Indonesian student in 2001 being equivalent to that of a student in the seventh percentile of the French distribution.

These changes in the distribution of health and education should be taken into account when assessing global inequality in a broad sense. While this entry provides only a very brief summary of the existing evidence along each dimension, a number of scholars have attempted to explore the correlations among the different dimensions. Because increases in longevity have been greater in poorer countries, for instance, Becker, Philipson, and Soares (2005) argue that inequality in measures of well-being that account for quantity, as well as quality, of life have been declining throughout the postwar period.

Another important aspect is the correlation of incomes over time, and the lack of mobility of countries in the international distribution. The persistence of poverty and income gaps across countries or individuals is not adequately represented by measures that are based on static snapshots of the global or international distribution of income. Relative income dynamics matter. Somehow, the severity of inequality, as observed at two different points of time, depends on whether individuals keep the same position or whether they switch. This is the reason for the attention given to the issue of convergence and the accompanying concept of intercountry inequality; for further discussion see Bourguignon, Levin, and Rosenblatt (2004), who analyze in some detail this issue of country mobility in the international distribution.

More work is needed to properly evaluate the extent of "global inequity" in all its dimensions and its evolution over time. Yet, despite the conceptual and methodological minefield inherent in measuring world income inequality and poverty, it is possible to reach agreement on some key stylized facts:

- Global income inequality was high in the early 19th century, but is even higher today.
- From the industrial revolution until roughly the middle of the 20th century, inequality rose in all three concepts of world income distribution: intercountry, international, and global.
- From around 1950 onward, although intercountry inequality continued to rise, (population-weighted) international inequality first stabilized and then declined. This reflects the catch-up of Asia with Europe and North America.
- Rising within-country inequality has attenuated the decline in global (interpersonal) inequality associated with growth in some of the poorest and largest countries, notably China and India. Nevertheless, global inequality appears to have fallen, or at least reached a high plateau, during the late 1990s.
- Although world inequality in the first few years of the 21st century has not yet been

properly analyzed, it seems likely that this trend has continued. Since 2002, the mean growth rate for low-income countries has been above the average rate for high-income countries, for the first time since the 1960s.

- Absolute income inequality in the world—the absolute gap between “rich” and “poor”—has been rising since at least 1970 and probably for a long time prior to that.
- Even so, the incidence of absolute poverty in the world as a whole has been falling since at least the early 1980s, though more rapidly in some periods and regions than others.
- Some large disparities in human development persist, although it is encouraging that global inequalities in health and education attainments have been falling overall. The scourge of HIV/AIDS has threatened this progress, with falling life expectancies in some of the poorest countries.

**See also** international income convergence; poverty, global

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FRANÇOIS BOURGUIGNON, FRANCISCO FERREIRA,  
BRANKO MILANOVIC, AND MARTIN RAVALLION

### ■ global production networks (GPNs)

See commodity chains

### ■ global public goods

Whether people live in industrial or developing countries, whether they are poor or rich, their well-being, in large measure, depends on the availability of