A Proposal for Truly Global Poverty Measures

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Abstract

Standard absolute poverty measures probably understate poverty rates in rich countries, given that their residents face higher welfare costs of social inclusion and relative deprivation. At the same time, standard measures of relative poverty probably understate the extent of poverty in poor countries, given that these measures attach little value to social inclusion needs at low mean income. This article provides the first estimates of a new class of truly global measures that aim to avoid these deficiencies of past measures. The results indicate that worsening distribution in the set of high-income countries has pushed up the incidence of relative poverty since 1990, but not by as much as success against absolute poverty has swelled the ranks of the relatively poor in the developing world. The incidence of purely relative poverty is now higher in the developing world than among rich countries – reversing the historical pattern.

Policy Implications

- The very different methods used to measure poverty in poor vs rich countries can be unified to obtain a truly global measure of poverty. This allows for the costs of avoiding social exclusion and relative deprivation in both poor and rich countries.
- Economic growth has generally meant a lower absolute poverty rate, but over time it has also meant that in many developing countries relative considerations have become more important.
- Not only is the incidence of extreme absolute poverty higher in the developing world, so too is relative poverty. Over 90 per cent of globally poor people live in the developing world.
- While economic growth will remain important to reducing poverty by this new measure, it also underlines that policy efforts must pay greater attention to reducing inequality than in the past, when the main focus was on absolute poverty.

While many ideas seem to be converging globally, there is one important topic where two distinct views of the world still coexist, with rather little communication between them. That topic is poverty. The rich world of 'high-income countries' (HICs) has, by and large, maintained a highly relative idea of what poverty means, emphasizing the distribution of relative incomes in the place of residence. In contrast the developing world has viewed poverty as absolute, meaning that two people with the same command over commodities are treated the same way irrespective of where they live.

With 86 per cent of the world's population living in developing countries, it is no surprise that when people have talked about 'global poverty' they have typically meant people living in absolute poverty, such as those living below the World Bank's international line of $1.25 a day at purchasing power parity in 2005.[1] This is a frugal line indeed, being set at the average line found among the 20 or so poorest countries. Virtually all those living in poverty as judged by this line are found in the developing world. Naturally, richer countries have higher lines. Figure 1 plots national poverty lines across countries against their (log) private consumption per capita. The highest poverty line is for Luxembourg, at $43 a day – over 30 times the $1.25-a-day line. Granted, this is an extreme value. But even the US poverty line is over ten times the $1.25-a-day line.

However, we are seeing signs of dissatisfaction with the standard measures of absolute poverty used in the past. The idea of what poverty means is changing in the developing world. For example, in 2011 China doubled its national line from 90 cents a day to $1.80 (at 2005 purchasing power parity). Having quadrupled its mean income in 30 years or so, it can hardly be surprising that China has revised upwards its real poverty line. Other countries – including Colombia, India, Mexico, Peru and Vietnam – have also done so recently.

At the root of this emerging dissatisfaction with standard measures based on low 'subsistence' lines is the fact that they do not take account of the concerns people everywhere face about relative deprivation, shame and social exclusion. It has long been recognized that, for such reasons, an absolute line in the welfare space requires a varying relative line in terms

Figure 1. Poverty lines across the world.
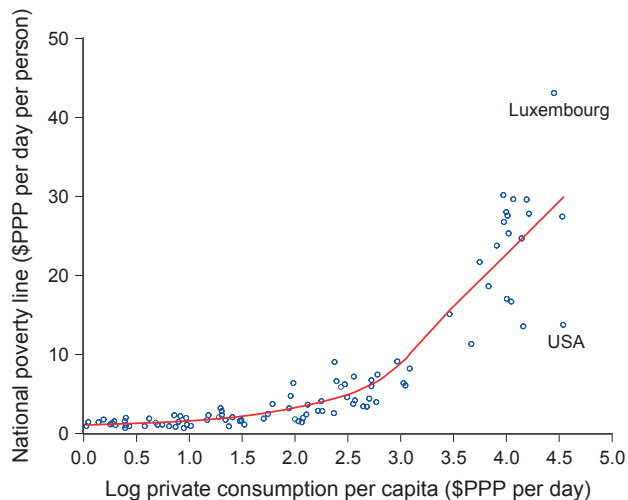
of consumption; see, for example, the discussion in Sen (1983). Absolute measures in the consumption or income space ignore such 'social effects' on welfare, and assume instead that it does not matter where one lives once one knows a person's own level of consumption. That assumption is looking increasingly difficult to defend. Absolute lines in the income space may not then correspond to a common level of welfare across countries. To the extent that 'poverty' means a low level of welfare *and* welfare depends on relative consumption as well as own consumption, higher monetary poverty lines will be needed in richer countries to reach the same level of welfare.

In characterizing 'global poverty', might the world as a whole turn instead to the relative poverty measures popular in western Europe and at the Organization for Economic Cooperation and Development (OECD)?[2] These use poverty lines set at a constant proportion (typically around half) of the current mean or median.[3] Until recently, this approach has attracted very little interest outside western Europe, although this may well be changing. For example, in a recent OECD report, Garroway and de Laiglesia (2012) provide such relative measures for developing countries.

However, these standard measures of relative poverty have a feature that leads one to question their relevance to developing countries. In particular, they ignore the fact that the costs of avoiding relative deprivation and social exclusion cannot fall to zero, but must have a positive minimum. Consider the classic example of a 'social inclusion' need found in Adam Smith's description of the role of a linen shirt in 18th-century Europe, whereby 'a creditable day-labourer would be ashamed to appear in public without a linen shirt' (Smith, 1976, p. 628).

(Clothing can also serve a social role in poor countries today.) Because a socially acceptable linen shirt cannot cost any less for the poorest person (let alone cost zero in the limit), it simply cannot be that the relative line is a constant proportion of the mean. The analogous commodity to a linen shirt in today's urban China (say) may well be a cell phone, but the point remains. The relevance of these measures for capturing what poverty means in developing countries is highly questionable.

Understating the social inclusion needs of poor people also comes with a seemingly perverse implication for how these measures respond to economic growth and contraction. When the poverty line is set at a constant proportion of the mean the resulting poverty measure depends solely on the distribution of relative incomes in the population, which can be loosely interpreted as 'inequality'. If all income levels grow (or contract) at the same rate, then the poverty measure will remain unchanged when the poverty line is set at a constant proportion of the mean or median.

So it seems that if we are to take a truly global perspective on poverty we need a new way of measuring it. This article first summarizes the salient features of an approach that has been outlined in greater detail elsewhere (Ravallion and Chen, 2011). It then presents the first truly global poverty measures following this approach. This helps throw new light on a number of questions. If we take seriously the idea that people living in rich countries need higher expenditures to maintain a given standard of living, is it still true that the incidence of poverty is lower in rich countries? How important is relative poverty in today's developing world, and how has this changed? How does this compare to HICs? And what are the implications for development policy of a higher weight on relative poverty?

A new, globally relevant, measure of poverty

We can do better in measuring global poverty than either of the methods favored in the 'two worlds' while still taking seriously the idea of social effects on welfare. This requires that we modify the usual concept of relative poverty to make it relevant to poor countries as well as rich ones. Ravallion and Chen (2011) proposed a new class of poverty measures that aim to capture the costs of social inclusion in a consistent way across countries, both rich and poor. By this new measure, a person is counted as poor if he or she is either absolutely poor or relatively poor, where the latter concept aims to allow for relative deprivation and the costs of social inclusion in addition to assuring that absolute needs are met. This builds on an approach proposed by Atkinson and Bourguignon (2001), but with the important difference that our measure allows the cost of social inclusion to have a positive lower bound.

The resulting measures can be said to be 'weakly relative' – to distinguish them from past 'strongly relative' measures in which the poverty line is set as a constant proportion of the mean. Unlike the strongly relative measures, these new measures fall when all incomes increase by the same proportion; this is an immediate implication of requiring that the cost of social inclusion has a positive lower bound. So the new measures essentially put a higher weight on growth in the mean than did the old relative measures. The new measures also put a higher weight on income inequality, relative to growth in the mean, than an absolute measure. To illustrate this last point, suppose that, from the perspective of fighting absolute poverty, the government is indifferent between letting inequality rise by some amount and an increase in the mean in the amount, ΔM. Fixing ΔM, we can then ask how much less inequality would be accepted if the government switched to our new poverty measure, letting the poverty line adjust to the new mean. Chen and Ravallion (2013) show that only about one third of the increase in inequality that was acceptable when using an absolute measure would be tolerated if the country switched to our new measure, all else held constant.

Chen and Ravallion (2013) have calibrated the parameters of this new measure to data on national poverty lines across countries (the same data set described in Ravallion et al. (2009)). In doing so it is argued that national poverty lines encompass social effects on welfare, which vary with the context such that even though two people have the same real income, the one living in the richer country will be worse off, either because of feelings of relative deprivation or higher expenditures required for social inclusion. However, this approach also recognizes that there are likely political frictions in adjusting national poverty lines to rising overall living standards, interpretable as measurement errors (Ravallion and Chen, 2011).

In operationalizing the idea, Chen and Ravallion (2013) have used an absolute line of $1.25 a day at 2005 prices, while the relative line rises with the country- and year-specific survey mean above $1.25 a day, at a gradient of 1:2. The minimum cost of social inclusion is set at one half of $1.25. Thus the schedule of poverty lines is $Z_{it} = \$1.25 + \max(M_{it} - \$1.25, 0) / 2$, where M_{it} denotes the survey mean for country i at date t. This schedule of poverty provides an excellent fit with cross-country data on national poverty lines. Indeed, its parameters are very close to those implied by an econometric estimate of the piece-wise linear schedule (Chen and Ravallion, 2010, 2013). Notice that the measures are anchored to the survey mean. Thus they can also allow for differences in relative poverty between urban and rural areas within a given country.

Table 1 gives the average poverty lines over time both globally and for HICs and the developing world separately. (We say more about the surveys later. Note also that these average lines are purely for descriptive purposes; they have no analytic role because poverty lines are calculated at country–year level.) For the world as a whole, the average line in 2008 is $5.88 per day, up from $4.45 in 1990. The lines are, of course, markedly higher in HICs, given their higher average consumption levels. At $23 a day, the average line for HICs in 2008 is eight times higher than for developing countries.

The elasticity of the poverty line to the mean for HICs turns out to be very close to unity – the limiting case corresponding to the strongly relative lines. Indeed, the mean (and median) elasticity for HICs is 0.97 (compared to a mean of 0.67 for developing countries). So for the HICs, this is pretty close to the more familiar strongly relative lines, implying that they depend largely on relative distribution.

It is for the developing countries that the difference matters most. The average value of the corresponding strongly relative lines (set at half the mean) for the poorest 15 countries is $0.64 a day – only half of the $1.25-a-day line proposed by Ravallion et al. (2009). The poverty line for the country with the lowest mean would be only $0.38 per day, an almost unimaginably low level of living. Similarly, the Garroway and de Laiglesia (2012) relative line, set at 50 per cent of the median, gives lines that are well below the poverty lines typical of even low-income countries, and certainly of middle-income countries. (This is plain from a graph in their article, although they do not comment on this point.) While strongly relative lines might make sense in very rich countries, they cannot plausibly capture the social inclusion needs of the world's poorest – or even their basic survival needs.

Table 1. Average poverty lines, 1981–2008.

	1990	1993	1996	1999	2002	2005	2008
Mean poverty line in $ per person per day at 2005 PPP with $1.25 as absolute line							
Global total	4.45	4.85	4.99	5.08	5.29	5.60	5.88
High-income countries	16.56	19.06	19.87	20.91	21.74	23.00	23.32
Developing world	2.11	2.18	2.24	2.23	2.37	2.60	2.94

PPP, purchasing power parity.

However, there is an important caveat to the interpretation of our new measures. Welfare norms for defining poverty may well differ between rich and poor societies, and evolve over time in growing economies. This can result in higher monetary poverty lines in richer countries even without social effects on individual welfare; rather, it is the reference level of welfare – the underlying level of welfare that is deemed necessary to not be considered 'poor' – that rises with mean income. And we cannot distinguish empirically between differences in poverty lines arising from differing social norms from differences due to social effects on welfare.

This clouds the interpretation of all relative poverty lines, whether weakly or strongly relative. Social effects on welfare are no doubt at play, but so too are differences in underlying welfare norms. Relative poverty lines make sense if one thinks that the fact that richer countries have higher lines largely reflects social effects on welfare. One would be less inclined to accept relative lines if one thought that the differences stem largely from social norms. While rich countries are free to use higher reference welfare levels for defining poverty, that does not mean we should do so in making global poverty comparisons – which should presumably apply a common *welfare* norm on ethical grounds. For this reason, Chen and Ravallion (2013) argue that both absolute poverty measures and their weakly relative measures need to be considered, and that they can be interpreted as the lower and upper bounds to an unobserved schedule of poverty lines that accord with a common level of welfare globally.

The first truly global poverty measures

We have (for the first time) extended the estimates of our poverty measures to include HICs. We set the absolute ($1.25 a day) poverty rate in HICs to zero. Our calculations from the survey data suggest that this is plausible, although we must acknowledge that there are limitations to how well one can expect to measure such extreme poverty using standard household surveys – for example, it is hard to sample homeless people.

We have used almost 1000 household surveys for almost 150 countries, 21 of which are HICs. For the latest year, the surveys are representative of about 90 per cent of the population, and that proportion is about the same for the developing world as for HICs. Our survey data go back to the late 1970s, but (naturally) coverage is poorer the further back one goes. Here we start the clock in 1990. We use a consistent methodology following Chen and Ravallion (2010, 2013). For developing countries we use the data base described in the latter papers and available at the data website we maintain, PovcalNet (http://econ.worldbank.org/povcalnet). For the HICs, we rely mainly on the data base of the Luxembourg Income Study (LIS) (http://www.lisproject.org/data-access/lissy.htm). All relevant exchange rate conversions are at purchasing power parity (PPP) using the 2005 PPP rates for household consumption from the International Comparison Program (World Bank, 2008a, 2008b).

There are differences between the underlying surveys for which we cannot correct. An example is the fact that we are constrained to use income from the surveys for HICs while we use consumption data for about two thirds of the developing countries (including imputed values for consumption from own farm product). We used household disposable income in the LIS data files. This will typically have a higher mean than consumption. However, for relative poverty comparisons the more important difference is that incomes tend to have higher inequality, given that there tends to be greater idiosyncratic intertemporal variability in incomes than consumption, which can be smoothed to some extent using savings or borrowing. (Progressive income tax systems in HICs will help smooth disposable incomes, but we can still expect them to be more variable over time than consumption.) We expect that this difference will lead us to overstate relative poverty incidence in HICs, when compared to the situation if we had consumption surveys for HICs.[4]

Figure 2 shows how the various measures discussed here have been changing, at three-yearly intervals from 1990 to 2008. Table 2 gives the precise numbers and the counts of people living in poverty. The 'truly global' poverty rate combines absolute poverty (as judged by poverty lines found in the poorest countries) with social inclusion needs (as judged by poverty lines typical of the county one lives in). And it represents all countries, whether rich or poor.

We see in Figure 2 that the global poverty rate has been falling steadily from 50 per cent in 1990 to 44 per cent in 2008. But underlying this, we see sharply falling

Figure 2. Truly global poverty rates and the differences between rich and poor countries.
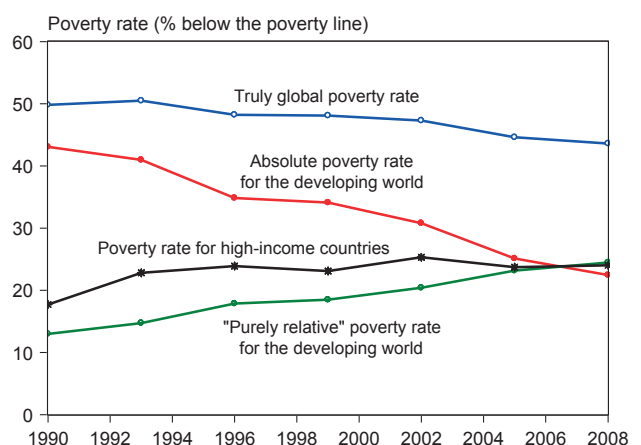
Table 2. : Poverty measures for the world 1990–2008							
	1990	1993	1996	1999	2002	2005	2008
Poverty rate (% of population who are poor either absolutely poor or relatively)							
Global total	49.8	50.5	48.2	48.1	47.3	44.6	43.6
For those in high-income countries	17.7	22.8	23.9	23.1	25.3	23.7	24.0
For those in the developing world	56.0	55.7	52.7	52.6	51.2	48.2	46.9
Of whom absolutely poor	43.1	41.0	34.8	34.1	30.8	25.1	22.4
Of whom relatively poor only	13.0	14.7	17.9	18.5	20.4	23.1	24.4
Number of poor (millions)							
Global total	2626.5	2786.5	2778.9	2887.7	2949.0	2883.4	2912.1
For those in high-income countries	143.5	188.9	201.8	199.0	222.4	212.4	219.2
For those in the developing world	2483.0	2597.6	2577.1	2688.7	2726.6	2671.0	2692.9
Of whom absolutely poor	1908.6	1910.3	1704.0	1743.4	1639.3	1389.6	1289.0
Of whom relatively poor only	574.4	687.3	873.1	945.3	1087.3	1281.4	1403.9
Poverty gap index (%)							
Global total	17.9	18.0	17.1	17.1	17.1	15.6	15.2
For those in high-income countries	5.8	7.7	8.4	7.7	10.0	8.0	8.3
For those in the developing world	20.3	19.9	18.7	18.8	18.3	16.9	16.3

Source: Authors' calculations.

absolute poverty rates for the developing world, and rising relative poverty rates in both worlds (although less steeply for HICs). There are also clear signs of convergence in the overall poverty rates between the two worlds; in 1990, the overall poverty rate (absolute plus relative) was three times higher in the developing world, but this had fallen to double by 2008.
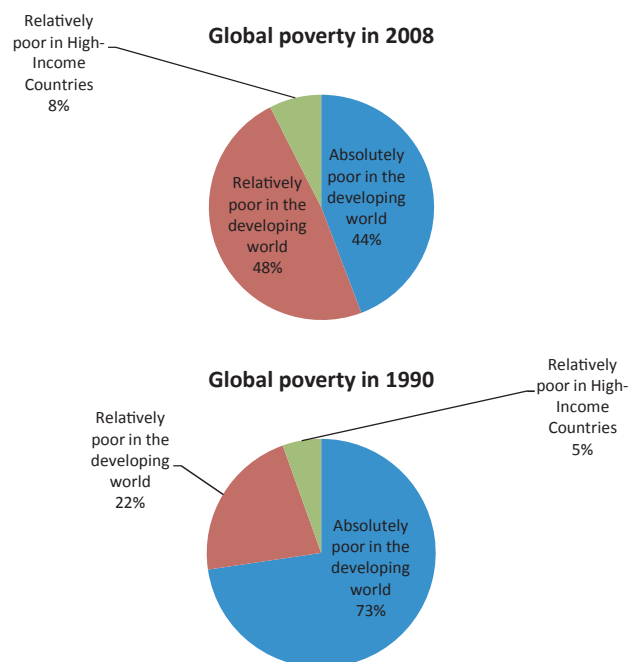
Possibly the most striking finding is that *relative* poverty is now overwhelmingly a problem of the developing world. Despite the fact that the average line in developing countries is only one eighth of that for HICs (Table 1), the proportion of the population who are relatively poor is about the same at 24 per cent in both sets of countries in 2008 (Table 2). (If we had consumption data for HICs then we would expect lower poverty measures, so this would strengthen our conclusion that relative poverty is higher in developing countries.)

In terms of the poverty counts, nine out of ten people who are poor by the typical standards of the country they live in but not absolutely poor are now found in developing countries. The developing world contained 92 per cent of the poor, and 86 per cent of the purely relatively poor (its share of the world's total population, given that the purely relative poverty rates are about the same).

The composition of global poverty counts has changed markedly since 1990. (Figure 3 gives the pie charts for 1990 and 2008.) The developing world's share of relative poverty has been rising fairly steadily. In 1990, the absolutely poor (living below $1.25 a day) in the developing world comprised 1.9 billion people, while the developing world's relatively poor numbered 0.6 billion; the remainder comprised about 140 million relatively poor people in the HICs. By 2008 the total number of poor people had risen to 2.9 billion. But the composition had shifted

dramatically. The number of absolutely poor people had fallen to 1.3 billion, while the number of relatively poor people had risen to 1.6 billion, 1.4 billion of whom lived in the developing world. The proportion of the population of the developing world today who are relatively poor but not absolutely poor is almost certainly higher than that found in HICs.

Table 2 also gives the poverty gap (PG) indices.[5] Here too we see signs of convergence, with the ratio of the

Figure 3. Counts of global poverty for 1990 and 2008.

Global poverty in 2008

Relatively poor in High-Income Countries 8%

Absolutely poor in the developing world 44%

Relatively poor in the developing world 48%

Global poverty in 1990

Relatively poor in High-Income Countries 5%

Relatively poor in the developing world 22%

Absolutely poor in the developing world 73%

PG index for HICs to that for developing countries falling from 3.5 to 2.0 between 1990 and 2008. The income gap ratio (the ratio of the PG index to the poverty rate) has in fact fully converged between the two worlds, at 0.35 in 2008 (up from 0.33 in HICs in 1990, and down slightly from 0.36 in developing countries). The mean income of the poor is the same proportion of the weakly relative poverty line in the two worlds.[6]

Differences among developing countries

So far we have focused on developing countries as a whole. Figure 4 gives the geographic breakdown of the poverty rates for 1990 and 2008.

In 2008, sub-Saharan Africa (SSA) was the region with the highest absolute poverty rate (48 per cent) and the highest overall (absolute plus relative) rate (61 per cent); Latin America was the region with the highest 'relative-only' rate. Four regions (Latin America, Middle East and North Africa, East Asia, Eastern Europe and Central Asia) had a higher purely relative poverty rate in 2008 than the HICs.

The incidence of purely relative poverty rose in all regions between 1990 and 2008, while the incidence of absolute poverty fell. The relative poverty rate in HICs was higher in 2008 than in 1990 but has fluctuated around 24 per cent since the mid-1990s, with no trend in either direction (Figure 2).

East Asia is the only region that has seen a decline in the total number of people who are either absolutely poor or relatively poor, falling from 1047 million in 1990 to 840 million in 2008 (Figure 5). However, this was almost solely due to China, where the number of poor people has fallen by over 200 million since 1990 (Chen and Ravallion, 2008). In the rest of East Asia and other regions, the decline in the incidence of poverty has not been sufficient to reduce the counts of the number of poor people. South Asia saw the largest increase in the count of poor people. This was entirely due to an increase in the number of relatively poor people; indeed, the number of absolutely poor people fell over this period (from 617 million to 571 million). In HICs, the count of the poor has fluctuated around 200 million since the mid-1990s.

Conclusions

It is no surprise that richer countries use higher poverty lines. The issue is why. To the extent that this difference can be attributed to the extra cost of attaining the same level of welfare in rich countries (given the existence of social effects on welfare due to concerns about social exclusion and relative deprivation) a welfare-consistent global measure should respect these differences. However, in doing so, it does not seem plausible that the line

Figure 4. Poverty rates across regions of the world.

2008

1990
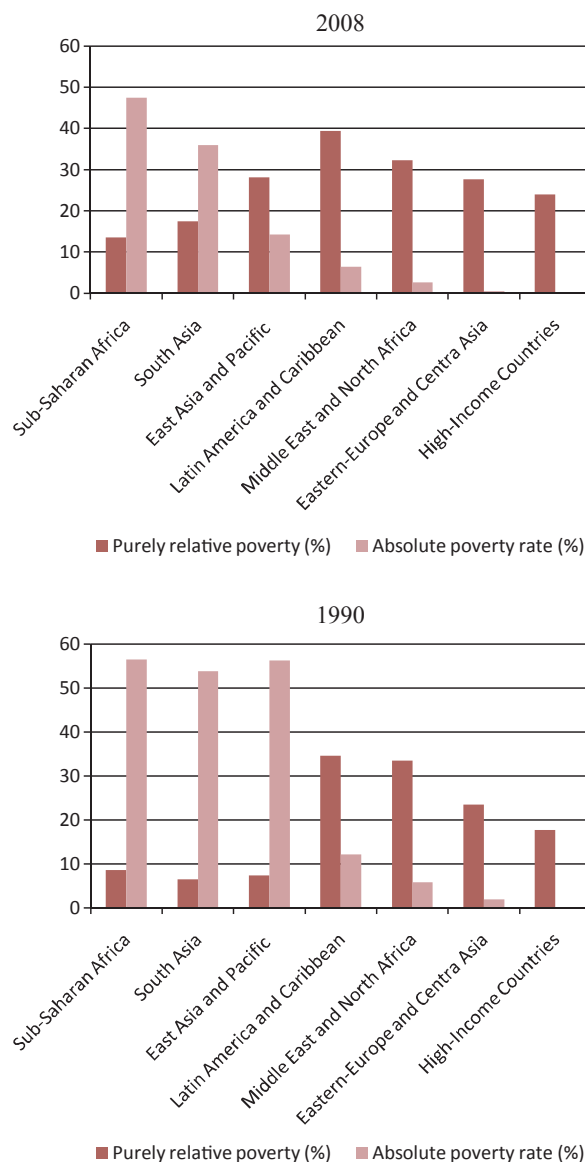
could be directly proportional to the mean (or median), as is standard practice in western Europe and OECD countries. This might well be defended as a reasonable approximation in rich countries, but it almost certainly understates social inclusion needs in poor countries. We have proposed an alternative approach that bridges the absolute and (strongly) relative measures found in past practice in the 'two worlds', and we have applied the measures to survey data for 150 countries including (for the first time) HICs.

Our first estimates of truly global poverty measures – combining absolute and relative poverty and on a consistent basis across rich and poor countries – indicate that about one quarter of the population of high-income

Figure 5. Counts of total poverty for 1990 and 2008.

Total poverty (absolute + relative) in 1990 and 2008

■ 1990   ■ 2008
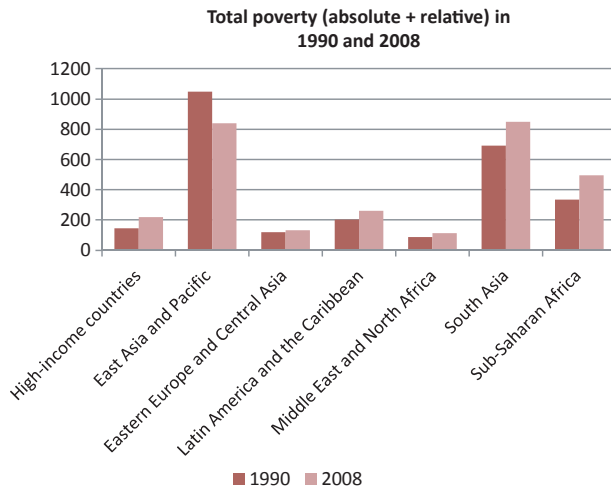
countries is poor. This is still only about half of the incidence of total poverty in the developing world, although that difference is almost entirely due to the presence of absolute poverty in the developing world. What is more striking in these findings is that the incidence of purely relative poverty is now higher in the developing world than in the rich world.

The world's success against extreme poverty is undeniable, although we should not forget that over one billion people still live below $1.25 a day. And one should not be surprised that this success has come with rising numbers of relatively poor people in the developing world. A great many more people can now afford the frugal consumption bundles underlying the poverty lines found in low-income countries. But they are not yet reaching the more generous allowances for social inclusion typical of the countries in which they live. Economic growth has generally meant a lower absolute poverty rate, but over time it has also meant that in many developing countries relative considerations have become more important. Rising numbers of relatively poor people in the developing world can thus be seen as the other side of the coin to falling numbers of absolutely poor people. By contrast, rising relative poverty in HICs has come mainly from changes in relative distribution, associated with rising inequality.

Greater attention to relative poverty does not imply that rich countries should not feel compelled on moral grounds to help poor countries. As we have noted, cross-country differences in social norms used for deciding what 'poverty' means are no doubt also at play – alongside social effects on welfare – in determining why richer countries have higher poverty lines. We do not know how much of what we measure as 'relative poverty' is in fact due to an underlying economic gradient in norms. This fact clouds the global policy implications.

Nonetheless, the measures proposed here imply that the incidence of relative poverty in the developing world now exceeds that found in HICs. While very few people living in rich countries are poor by the standards of the world's poorest countries, when one adopts a concept of poverty that tries to allow for social exclusion and relative deprivation consistently with the structure of national poverty lines one also finds that relative poverty – as well as absolute poverty – is overwhelmingly found in the developing world.

The emergence of concerns about relative poverty in the developing world also has implications for the emphasis given to economic growth vs redistribution in fighting poverty. Future progress against relative poverty in the developing world will undoubtedly be slower than we have seen against absolute poverty. Economic growth has generally come with a lower absolute poverty rate but it has also meant that many developing countries have moved into the region in which relative considerations become more important. In contrast to past measures of relative poverty, the new global poverty measure discussed here will fall with economic growth as long as it does not come with a sufficient increase in inequality. However, policy efforts to fight relative poverty will almost certainly need to give greater consideration to how best to reduce inequality than has been the case in the past, when the main focus has been on absolute poverty.

Notes

1. On how this line is derived, see Ravallion et al. (2009).
2. Examples of relative lines include Atkinson (1998), Eurostat (2005), Nolan (2007) and OECD (2008, Chapter 5).
3. For example, the EU (Eurostat) poverty lines are set at 60 per cent of the national median equivalized income.
4. This is the first time we have extended our estimates to HICs. There is still further work to do on the data, including testing robustness to some of the comparability problems.
5. The PG index is the mean gap below the poverty line (counting this as zero for the non-poor) as a proportion of the line, expressed as a percentage.
6. The income gap ratio is the difference between the poverty line and the mean consumption or income of those living below the line, expressed as a proportion of the line.

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