

Unknown: The Extent, Distribution, and Trend of Global Income Poverty

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For some twelve years now, the World Bank (“the Bank”) has regularly reported the number of people living below an international poverty line, colloquially known as “\$1/day”.³ Reports for the most recent year, 1998, put the number of people below this line at 1,175.14 million.⁴ The Bank’s estimates of severe income poverty — its global extent, distribution in space, and trend over time — are widely cited in official publications of governments and international organizations and in popular media, often in support of the view that liberalization and globalization have helped to reduce poverty worldwide. For instance, the President of the World Bank recently declared: “Over the past few years, these better policies have contributed to more rapid growth in developing countries’ per capita incomes than at any point since the mid-1970s. And faster growth has meant poverty reduction: the proportion of people worldwide living in absolute poverty has dropped steadily in recent decades, from 29% in 1990 to a record low of 23% in 1998.”⁵

Most readers, including many economists, take these figures as clear-cut facts. But the method used to calculate them has serious flaws, which render the resulting estimates untrustworthy. The international poverty line used by the Bank to identify the absolutely poor fails the most elementary requirements of consistency, as it does not have a common interpretation at different points in space and in time. As a result, it can identify two persons facing similar circumstances as poor in one case and as non-poor in another case, leading to poverty estimates that lack in meaning. Another serious problem is that the Bank’s poverty line, contrary to first appearances, has no interpretation as an amount of resources needed to meet the basic requirements of human beings. Finally, the poverty estimates currently available are subject to massive uncertainties because of their sensitivity to the values of crucial parameters that are estimated on the basis of limited data or none at all. An alternative method of estimating global poverty is feasible and necessary.

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4 Chen and Ravallion 2001, 290. The numbers reported here are slightly revised from those provided for the same year (1998) in World Bank 2000, 23. See also www.worldbank.org/research/povmonitor/.

5 James D. Wolfensohn: “Responding to the Challenges of Globalization: Remarks to the G-20 Finance Ministers and Central Governors,” Ottawa, November 17, 2001, www.worldbank.org/html/extdr/extme/jdwp111701.htm.

The Bank's Methodology Overstates the Purchasing Power of the Poor in Relation to the Commodities That They Need

The Bank defines its international poverty line in terms of the purchasing power that a certain US dollar amount had in the United States in a particular base year — for example, \$1 1985 per day (the international poverty line employed by the Bank in its first global poverty estimation exercise). To make this line applicable to other countries and years, the Bank uses a two-step procedure. First, the Bank undertakes a spatial translation of the international poverty line. It uses purchasing power parity conversion factors (PPPs) to estimate the amount of local currency needed to have real income equal in purchasing power to \$1 in the United States in 1985. In this way,, the Bank determines, for each country, a 1985 national poverty line deemed equivalent to the international poverty line. Second, the Bank undertakes a temporal translation of the resulting poverty lines. It employs national consumer price indices to determine, for each country, national poverty lines for other years that are deemed equivalent.. Relying on household income surveys, the Bank then identifies a country's poor in any given year as those living below the country's national poverty line for that year. Though apparently straightforward, this approach generates significant problems. The main difficulty is that "equivalent" purchasing power over commodities is an incomplete concept. The critical missing question is: Equivalent purchasing power over **what** commodities? The Bank bases its cost-of-living adjustments across countries on data concerning the prices and quantities consumed of **all** commodities, many of which (such as cars, plane tickets, and stereos) are not consumed by the poor.

Price ratios between rich and poor countries vary widely across commodities. For goods that are easily traded across borders, prices compared at market exchange rates are about the same in rich and poor countries. For goods and services that are not easily traded across borders, prices compared at market exchange rates can easily be fifty times higher in rich countries than in poor ones. General-consumption PPPs average out these price ratios in a way that, roughly speaking, weights each commodity in proportion to its share in international consumption expenditure.

The use of such PPPs is quite inappropriate for poverty assessment and severely distorts the resulting poverty estimates. To illustrate, consider a simple example of two countries and two commodities. Suppose, not unrealistically, that basic foodstuffs cost about thirty times as much in Rupees in India as they cost in Dollars in the US. In other words, suppose that it costs 30 Rupees to buy the foodstuffs in India that can be bought with \$1 in the US. Suppose also that services (maids, drivers, haircuts, etc.) cost about three times as much in Rupees in India as they cost in Dollars in the US. Current methods of constructing PPPs, which consider the consumption pattern throughout the world, will deliver a PPP of perhaps Rs.10:\$ 1 (conveying the impression that Rs.10 contain the same purchasing power as US\$1). An Indian with income of Rs.10 per day is then not counted as having a real income falling below \$1/day even though she can buy only one third of the basic foodstuffs she would be able to buy with \$1/day in the US.

This is clearly unreasonable. If poor Indians can buy with Rs.10 only one third the basic foodstuffs that \$1 buys in the US, this disadvantage is not compensated by the fact that Rs.10 also buys over three times more services than \$1 buys in the US. Even if richer persons spend a large proportion of their income on services, the poor do not, and cannot, do so. They must concentrate what little income they have on basic necessities. The purchasing power of poor people should therefore be assessed by relating their incomes **not** to the prices of **all** goods and services, but **only** to the prices of those goods and services they must consume to meet their basic needs. Since the degree to which the international poverty line captures the cost of

purchasing basic necessities varies from country to country, it cannot be said that it identifies people facing similar circumstances as poor regardless of where they live.

We do not currently possess all of the data needed to estimate global poverty in a more sensible way, although it should be possible in the future to collect it. The data we do have suggest how global poverty estimates would be different if a more credible procedure were used. Existing data about the prices of foodstuffs and, more specifically, of staple bread and cereals, show that these items (a large part of the consumption requirements of the poor) cost far more in poor countries than general-consumption PPPs suggest. The same is true for many basic necessities other than food.⁶ It is very likely that the Bank, were it to use PPPs more closely linked to the needs of the poor, would translate its \$1/day standard into substantially higher national poverty lines for most poor countries.

How much higher would these national poverty lines be? If prices of foods, or more specifically of breads and cereals, rather than prices of all commodities were used to convert the \$1/day international poverty line, national poverty lines of poor countries would be some 30 to 40 percent higher on average,⁷ which could raise the estimated global incidence of severe income poverty substantially. For a small number of countries for which we were able to make estimates, we found that increases in national poverty lines by 30 to 40 percent entailed increases in poverty headcounts of a similar magnitude.⁸

The question of whether the international poverty line of \$1/day has an interpretation in terms of the resources needed by human being to achieve elementary capabilities, or the most basic aspects of human flourishing, may also be approached in another way. If the PPP conversion factors employed by the Bank correctly captured the currency amounts necessary in different countries to possess equivalent purchasing power, then the international poverty line would have such an interpretation in poor countries only if it had such an interpretation in the United States. Does it? One way to investigate whether this is so is to ask what is the cost of achieving a particular elementary capability (for example, the ability to be adequately nourished) in the United States. The Thrifty Food Plan, produced by the United States Department of Agriculture as a guide for low income households and government agencies, offers one answer to this question.⁹ Adopting a thorough and careful analytical methodology, the Plan estimates that the least cost of meeting a minimal calorie constraint (varying between 1600 and 2800 calories depending on age and gender) and a set of other minimal nutrient in the constraints (while minimizing the deviation from the existing pattern of consumption of low-income Americans) is \$98.40 (1999) per week for

⁶ Data from International Comparison Program benchmark surveys on <http://pwt.econ.upenn.edu>. An analysis is also contained in Sanjay Reddy and Thomas W. Pogge: "How Not to Count the Poor," working paper available at www.socialanalysis.org.

⁷ Reddy and Pogge, *ibid.*. See especially Tables 6A and 6B, giving population-weighted geometric means of this ratio for all poor countries for which data was available. If 'all-food' PPPs are used in lieu of general consumption PPPs to convert the international poverty line of \$1 PPP 1985 into national currencies, national poverty lines of poor countries increase by 40% on average. Using bread-and-cereals PPPs to convert \$1 PPP 1985, the average increase is 34%. Using all-food PPPs to convert \$1.08 PPP 1993 (the current international poverty line employed by the Bank), the average increase is 31%. Using bread-and-cereals PPPs to convert \$1.08 PPP 1993, the average increase is 40%.

⁸ *Ibid.*, Table 10.

⁹ See United States Department of Agriculture, 1999.

a reference family (consisting of a male and female ages 20 to 50, and two children ages 6 to 8 and 9 to 11). This least cost amounts to \$3.51 (1999) per day per person in the reference family. This is equivalent to \$3.04 1993 or \$2.27 1985 (adjusting by the U.S. CPI). Estimates in a similar range are garnered from other available exercises that have sought to establish the least cost of being adequately nourished in the United States.¹⁰ This comparison serves to make the point that, even if we allow for the possible generosity of the U.S. estimates of the cost of being adequately nourished, the \$1/day poverty line would seem to be rather insufficient for meeting the nutritional requirements of human beings (let alone the many other requirements that they have). This implies that (if we assume that there are no additional distortions associated with PPPs) an international poverty line set so as to be adequate for human beings to achieve a set of elementary capabilities would have to be set at substantially higher than \$1/day.

The Bank's Methodology Produces Unjustified Conclusions about Poverty Trends

We have shown that the Bank's assessments of the global **incidence** of severe income poverty are severely distorted, potentially causing a substantial underestimate of the number of people living below the Bank's chosen international poverty line. We shall now show that there is also reason to believe that the distortion worsens over time, leading the Bank to unjustified conclusions concerning the **trend** of severe income poverty worldwide.

One difficulty in inferring trends about poverty is that purchasing power parities calculated at different times offer a poor guide to the actual change in costs of living in countries. As mentioned, the international poverty line adopted by the Bank in its first global poverty estimation exercise was \$1/day 1985 PPP. More recently, it has adopted a poverty line of \$1.08/day 1993 PPP (a poverty line that the Bank also refers to as '\$1/day'). What is the relationship between these two poverty lines? Do they refer to the same level of purchasing power or to different levels of purchasing power, and if the latter then by how much do they differ?

We can attempt to answer this question by comparing the outcomes of two different procedures. In the first procedure, a poverty line for a country is calculated by converting the Bank's latest international poverty line (\$1.08 1993 PPP) into the country's currency by using the 1993 purchasing power parity conversion factor for the country. In the second procedure, a 1993 poverty line for a country is calculated by first converting the Bank's earlier international poverty line (\$1.00 PPP 1985) into the country's currency by using the 1985 purchasing power parity conversion factor for the country, and then adjusting the level of its 1985 national currency denominated poverty line so derived by the change in the country's consumer price index between 1985 and 1993. The national poverty lines for 1993 derived by these two distinct procedures diverge widely. The poverty line calculated by the second procedure varies from 70 percent of the poverty line as calculated by the first procedure (in the case of Nigeria) to 257

¹⁰ In 1963, the USDA estimates that the cost of three minimally adequate meals a day for a typical family of two adults and two children would be \$2.736 (1963), or \$0.684 (1963) per person. Adjusting the figure by the U.S. CPI results in an estimate of \$2.41 (1985) or \$3.24 (1993) per person. See Schiller, 2001.

percent of the poverty line as calculated by the first procedure (in the case of Mauritania) with the other countries scattered in-between.¹¹

Poverty lines for the same country and year calculated through the two different procedures vary greatly when expressed in local currencies. Moreover, the direction and magnitude of the difference between the two poverty lines is quite different from country to country. It cannot therefore be accepted that the Bank has merely “updated” the older line and that the “new line ... has a similar purchasing power to the \$1 a day line in 1985 prices.”¹² The fact is that the new line leads to large revisions in most national poverty lines. The Bank’s choice of \$1.08/day 1993 PPP as its new international poverty line generates an increase in some national poverty lines (e.g., Nigeria’s) and a large reduction in many others (e.g., Mauritania’s). Examining all 92 countries for which data are publicly available, the redefinition lowered national poverty lines in 77 countries, containing 82 percent of the total population of the 92 countries, and raised national poverty lines in only 15 countries. . The choice of a different international poverty line defined in 1993 PPP dollars, higher than \$1.08/day, could have achieved a more even balance between countries in which the new poverty line is higher and those in which it is lower than the old one. However, *no* choice of international poverty line would have reflected for all (or even most) countries the changes in domestic cost-of-living described by national consumer price indices with even reasonable accuracy, because the extent to which the ‘updated’ PPP conversion factors capture changes in consumer prices varies from country to country. The Bank’s own estimates of poverty for years in which the two methodologies are both applied to the same underlying data show that there arises massive variation in the number of poor estimated to live in specific countries and regions purely due to the change of methodology.¹³

Periodic adjustments of the base year (by reference to which the international poverty line is defined and purchasing power parity conversions are made) are a standard feature of the Bank’s procedure. It is important to note that such adjustments are likely to introduce a systematic bias toward painting too rosy a picture of poverty trends. Adjustment of the base year reduces the reported incidence of poverty insofar as the global consumption pattern is shifting toward commodities (such as services) whose prices, converted at market exchange rates, are very much lower in poor than in rich countries, and away from commodities (such as food) whose prices, converted at market exchange rates, are more similar between poor and rich countries. In recent years, the share of services in consumption has increased, and the share of food decreased (in keeping with the well-known relationship known as Engel’s Law) in a wide variety of rich and poor countries. As the global consumption pattern shifts in this way, commodities that are very much cheaper in poor than in rich countries are given more and more weight in the calculation of general-consumption PPPs. Using such PPPs to assess the incomes of very poor people thus becomes *increasingly* distorting. The distortion arises from the fact that, no matter how much the share of basic necessities in global consumption may diminish, a poor household

¹¹ Ibid., Table 5.

¹² World Bank 2000, 17.

¹³ For example, for the year 1990 the poverty headcount ratio in Latin America is estimated to be 22 percent according to the 1985 \$1 PPP standard, and 15.33 percent according to the 1993 \$1.08 PPP standard. For the year 1993, the poverty headcount ratio in Sub-Saharan Africa is estimated to be 39.1 percent according to the 1985 \$1 PPP standard, and 49.68 percent according to the 1993 \$1.08 PPP standard

must still focus virtually all its expenditure on such necessities. The apparent rise in the reported purchasing power of poor households due to a global consumption shift toward services can mask that such households have not gained greater access to the goods they most require.

To see the effect of such distortions, consider once more the simple example of two countries and two commodities. Suppose that the international poverty line has been sequentially defined in two different base years. Suppose further that rising general affluence has shifted global consumption away from items with higher relative prices in poor countries (such as food) toward items with lower relative prices in poor countries (such as services) in the period between two different base years. In the later base year, prices of services will then have greater influence, and prices of basic foodstuffs correspondingly smaller influence over the calculation of the new general-consumption PPP. Even if prices everywhere remain constant, the shift in the pattern of global consumption will cause the new general-consumption PPP to be lower (Rs.8/\$1, say) than the old (Rs.10/\$1). How could the international poverty line be “updated” in this scenario?

Maintaining the poverty line of \$1.00/day PPP would preserve the US poverty line but lower the Indian poverty line from Rs.10/day to Rs.8/day. Revising to \$1.25/day PPP would preserve the Indian poverty line at Rs.10/day but increase the US poverty line by 25%. Any intermediate value chosen is arbitrary — and also lowers the Indian poverty line. A redefinition of the international poverty line to the PPP dollars of a new base year amounts in this scenario to telling poor Indians that their opportunity to buy services very cheaply has become more valuable thanks to the increased share of services in international consumption. The Indian poor can plausibly reply that the global shift toward consumption of services is quite irrelevant to them, as they are still compelled to concentrate their expenditures on the basic necessities (such as foodstuffs) they need to survive.

The Bank presents itself as employing a constant international poverty line — “\$1/day” — that is merely “updated” periodically by switching to a more recent base year. This claim is simply false. The Bank does *not* provide a single international poverty line that is periodically adjusted. Each international poverty line is defined in terms of the PPP dollars of a specific base year, and therefore refers (roughly speaking) to the amount of local currency needed to maintain purchasing power over a basket of commodities reflecting the pattern of global consumption in that specific year. The Bank’s successive international poverty lines cannot be directly compared with one another. They can be compared only indirectly, by examining how any redefinition affects the national poverty lines deemed to be locally “equivalent” to the international poverty line. Insofar as global consumption is shifting toward commodities (such as services) that are relatively inexpensive in the poorer countries, and away from commodities (such as food) that are not relatively inexpensive in the poorer countries, the Bank’s periodic redefinitions tend to reduce national poverty lines and national poverty headcounts. These distortions arise fundamentally from a lack of focus in current methods of PPP estimation. National poverty lines aimed at identifying the absolutely poor ought not to depend on the prices and quantities of commodities consumed by the non-poor, in poor countries and in rich ones. However, this is precisely the case at present.

The Bank’s Estimates are Subject to Massive Uncertainties

A crucial point regarding limitations of current data is that even the general consumption PPPs currently in use are produced on the basis of limited and highly questionable evidence. A large

number of countries containing poor people — including some of those that contain the largest number (most notably, China and India) — have not participated at all in recent ‘benchmark’ price surveys of the International Comparison Program (ICP). As a result, a massive element of guesswork and gap-filling underlies current poverty estimates¹⁴.

The current estimates of PPPs considered plausible for China differ by a factor of two. Shifts in China’s poverty line resulting from the adoption of alternative PPPs would imply massive variations in the resulting estimates of the total number of the world’s poor. India has not participated in a benchmark survey since 1985. As observers of India are well aware, there are likely to have been significant changes in its internal price structure since then. Consequently, current poverty estimates are subject to substantial uncertainties. This fact should be more fully acknowledged.

Conclusion: There is a Feasible Alternative

Data about income poverty are of great importance for the design and assessment of policies and institutions. Poverty is a complex and multi-dimensional concept. There are other important sources of information about people’s standard of living: data about their health status and educational attainments and about mortality and morbidity, for example. Such data do and should inform overall judgments concerning the extent, distribution, and trend of poverty in the world. Income poverty data are nevertheless an essential part of the picture. Despite the Bank’s substantial efforts, we do not yet know with any reasonable degree of confidence how many income poor people there are in the world, how poor they are, where they live, and how their number has changed over time. If we are to monitor progress against absolute income poverty (as required by the first of the Millenium Development Goals) then this gap must urgently be filled.

Fortunately, the serious flaws in the Bank’s methodology have a common root and are avoidable through one straightforward innovation: The definition of severe income poverty must be more appropriately focused on what it is that makes a person poor rather than on whether the value of a person’s consumption is deemed to fall beneath an arbitrary dollar value of the international poverty line. This implies a focus on what people need to achieve a set of elementary capabilities rather than on arbitrary dollar amounts, and would give the international poverty line a clear and plausible meaning: those living below it lack the resources they need to satisfy the most basic requirements of human flourishing.

A criterion for identifying the poor should be specified in terms of the failure to possess (by reason of inadequate resources) a set of elementary human capabilities. In a global poverty monitoring exercise, it may be desirable in practice also to specify at the global level the characteristics of the commodities typically needed to achieve the elementary capabilities. For instance, the basic requirement of being adequately nourished can be furthered by consuming commodities containing calories and essential nutrients. The income persons need to avoid poverty at some particular time and place can then be specified in terms of the most inexpensive locally available set of commodities containing the relevant characteristics needed to achieve the elementary

¹⁴ For instance, through questionable ‘regression’ exercises. See Ahmad, S. (1992) for a description.

human capabilities, while respecting the role of factors beyond the immediate control of persons (such as specificities of culture or natural environment) that ought to be taken into account.

A fixed set of elementary human capabilities can also provide an invariant standard for adjusting national poverty lines over time so as to reflect changing prices of the basic necessities needed to achieve the elementary capabilities. Such adjustments should be done by national committees, acting with the goal of developing national poverty lines that are consistent with the global standard that has been adopted. There will be no need for a definition (let alone a periodic redefinition) of an international poverty line expressed in monetary terms, if this common standard — invariant across countries and years — is adopted. A common standard will allow the world to have confidence that the concept of poverty used in estimating the number of the world's poor **means** something — and that it means the **same** thing regardless of where and when they live.

If appropriate data on market prices and non-market opportunities of the poor are collected, then the typical least costs of achieving elementary human capabilities in different countries (and areas within countries) can be established. The income poor the world over will be identified as those whose real income is too small to purchase commodities sufficient to achieve the basic human capabilities that are typically achievable in this way. Unlike the \$1 per day concept, this approach to identify the poor permits the monitoring of global income poverty in a credible and meaningful way.

An effort to strengthen the data and methodology of poverty assessment within countries is needed if more meaningful global poverty estimates along these lines are to be created. Despite the feasibility of such efforts, their lack is notable. It is notable how absent such efforts have been, despite their feasibility. The diffusion throughout the world of a common system of national accounting through the involvement of the United Nations — an achievement that would have once been thought highly improbable — is an example of what can be done. Although the development of a credible system of global poverty monitoring will take time and will require resources, the costs of developing it are small in comparison to the potential costs of ignorance.¹⁵

A globally transparent and widely consultative process should underlie the development of a new system of global poverty monitoring. Without an effort to develop such a system, it will be difficult to accept that the institutions concerned are serious about the task.

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¹⁵ 'Post adjustment' data concerning the cost of maintaining a similar standard of living in different cities across the world is readily available for use by international agencies and multinational corporations (see e.g. Ahmad, 1992 and <http://www.un.org/Depts/icsc/cold/pubs/index.htm>). This serves as partial evidence that the resources needed to produce estimates of the cost of achieving elementary human requirements may not be prohibitive.

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