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**Measuring Global Poverty Right
Mission Impossible?**

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Abstract

**Measuring Global Poverty Right
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The international community is committed to millennium development goals which postulate a vision of global development that makes eliminating poverty and sustaining development the overriding objective of global development efforts. In the hierarchy of the MDGs, the first and foremost goal is to reduce by half, between 1990–2015, the proportion of people whose income is less than a dollar a day (a widely used yardstick to measure extreme poverty). However, estimating such poverty across developing countries and globally is by no means a simple exercise nor has it yielded unambiguous results. This article provides a brief summary of the state of the art in global poverty estimates, including the problems as well as the possible solutions.

Measuring Global Poverty Right Mission Impossible?

M. G. Quibria

In September 2000, the United Nations held its “millennium summit”, at which 189 member states unanimously endorsed a vision of global development that makes eliminating poverty and sustaining development the overriding objective of global development efforts. This vision, enshrined in the millennium development goals (MDGs), evolved out of the various conferences organized by the UN in the past decade. The MDGs have now come to constitute the internationally accepted framework for measuring and monitoring development progress.

The MDGs, comprising a formidable assortment of 8 goals, 18 targets, and 48 indicators, lay down measurable results not only for the developing countries but also for the developed countries and multilateral institutions that fund development efforts. The first seven goals seek to alleviate human deprivation in various forms and manifestations, whereas the eighth goal—global partnership for development—is concerned with the means to achieve the first seven goals. The UN Conference on Financing for Development in Monterrey in March 2002 was focused on addressing the issues related to the eighth goal of achieving greater international cooperation. In the hierarchy of the MDGs, the first and foremost goal is to reduce by half, between 1990 to 2015, the proportion of people whose income is less than a dollar a day, a widely accepted yardstick to measure extreme poverty. This threshold, which has obvious rhetorical appeal for the governments of developed countries and international development agencies, also approximately corresponds with the poverty lines used by many poorer countries.

However, estimating such poverty across developing countries and globally is by no means a simple exercise nor has yielded unambiguous results. This article provides a brief summary of the state of the art in global poverty estimates, including the problems as well as the possible solutions.

Divergent Sources of Global Poverty Numbers

The traditional source of global poverty data has been the World Bank. . Since 1990, beginning with the publication of the *World Development Report 1990*, World Bank economist Martin Ravallion, along with his collaborators, has been releasing these data on the state of global poverty on a periodic basis. However, in recent years, the World Bank has decided to adopt a more transparent disclosure policy, allowing outside scholars easier access to the relevant global data and information. This has enabled a number of non-World Bank economists to further explore the data and arrive at alternative estimates of dollar-a-day poverty for individual countries and for the developing world. Though these estimates are generally related to the World Bank poverty numbers, across time and over countries, what is disconcerting is that these alternative poverty estimates diverge significantly, in terms of magnitude, from those of the World Bank. However, the common message that comes out of these alternative sets of numbers is that the world has much less extreme poverty than what the World Bank reports.

Mechanics of Measuring Global Poverty and Difficulties

To understand the source of this divergence, it is worth retracing the steps to produce such estimates. The first step involves setting an international poverty line—the threshold income level that sets the poor apart from the non-poor—and develop comparable poverty lines for each developing country. This involves converting the dollar-a-day poverty line into national currencies by using the purchasing-power-parity (PPP) exchange rates. These purchasing- power- exchanges rates are an index that reflect the costs of buying a standard bundle of goods in each country relative to the United States. However, there are a number of problems with the PPP exchange rates, as they have not been initially constructed for the purpose of measuring poverty. To begin with, they are not available for all countries nor are they available for each year. So many of these numbers are guess estimates and extrapolations. But, even when they are available, the standard bundle of consumption underlying the PPP exchange-rate often represents the

purchases of the average household, not of the poorest. Second, the bundle of goods that poor families actually buy differs from country to country because of differences in tastes and availability. Finally, prices of some of the goods consumed by the poor, particularly staple food such as rice and wheat are subject to wild year-to-year fluctuations. This could lead to large year-to-year changes in the underlying PPP exchange rates. Given these problems, the task of converting the international poverty line into domestic currencies has proved extremely difficult in practice¹.

The second step involves using these national poverty lines to count the number of poor people in each country. The poor in each country are then added up to arrive at the total for all developing countries. Estimating the poor at the second step requires consumption expenditure data (or income, if such consumption data are not available) of families, which are usually obtained from household surveys. These surveys are random samples of households to obtain information about their incomes and expenditures. The standard mechanics at this stage involves three steps. The first step is to estimate a Lorenz curve for the country from household surveys. The Lorenz curve is a graph that represents the cumulative proportion of income—or consumption—against the cumulative proportion of the population beginning with the lowest income—or consumption. The second step is to assign monetary values to the Lorenz curve, which requires data on mean consumption (or income). The final step is to examine where the pre-defined poverty line is on the Lorenz curve and working out the percentage of the population that lies to the left of the poverty line.

¹ There is a new round of ongoing national price surveys—which are used to compute PPP exchange rates—under the aegis of International Comparison Program (ICP 2004). This round seeks to redress some of the problems associated with the estimation of international poverty lines across countries. First, the number of countries included in this round is much larger—around 150—and include both China and India (the latter did not participate since 1985 and even its 1985 participation was only half-hearted). This would eliminate the need for guess-estimates for the countries that are now included in the round. Second, the round seeks to compute PPP exchange rates based on the prices of goods and services consumed by the poor. This would make the PPP exchange rates much more relevant for international poverty estimates.

In this connection, three points about data are worth noting. First, it should be noted that there is a good deal of variation across countries in the quality of data. In some countries, there is better statistical capacity to undertake surveys and the survey methodology is better developed than others. Second, some countries, which include China and the most of Latin America, collect data on incomes, while others such as Indonesia, India and Pakistan collect data on expenditures. Poverty measures based on one do not yield estimates identical to those based on the other. Third, the mechanics of data collection do matter. For example, in one experiment, India's national survey organization asked half of the households it surveyed to report their expenditures over a 30-day period and the other half over a seven-day period. It was found that households reported 30 percent higher food consumption per day in the shorter interval, which is enough to cut the poverty rate in half. The fact that reporting periods and other details are different in different countries makes the task of devising comparable counts that can be added up across countries a difficult one.

The World Bank Poverty Counts and Alternative Estimates

In 1990, the World Bank provided the first set of such poverty numbers in its *World Development Report* for the developing countries as a whole and by region for 1985. These numbers were derived from a limited number of surveys, one each for 22 countries, and the rest were obtained from model-based extrapolations. However, the data situation has improved significantly over the years. Chen and Ravallion (2001) provided global poverty estimates for 1987, 1990, 1993, 1996, and 1998. These estimates were based on a much larger data set of about 300 surveys for about 90 countries. However, the poverty line used for these estimates was \$1.08 a day in constant 1993 PPP dollars. This was somewhat different from the original \$1 a day (more precisely \$31 a month) poverty line in constant 1985 PPP dollars used in the *World Development Report 1990*. It is, however, not clear why the World Bank decided to make this change in the poverty threshold. Nevertheless, these poverty estimates, despite their deviations from the strict

one-dollar mark, are conveniently referred to as dollar-a-day estimates presumably for their rhetorical value².

The World Bank's global poverty estimates are highly sensitive to the PPP estimates they use. This was very evident when the World Bank decided to rebase their poverty estimates from constant 1985 PPP dollars to constant 1993 PPP dollars. The earlier PPP numbers were derived from the Penn World Tables that covered only 60 countries. The 1993 PPP data, which are derived from the International Comparison Program, cover about 110 countries. However, this rebasing has had a devastating effect on poverty counts. As Chen and Ravallion (2001) reported, it led to a seismic shift in the global poverty landscape. For the same country, same year, and with the same survey data, this resulted in huge artificial changes in the poverty picture. The recalculation of the previous counts for 1993 at the new PPPs yielded a large increase in poverty in Sub-Saharan Africa from 39.1 to 49.7 percent; and a large decrease in poverty in Latin America from 23.5 to 15.3 percent, as well as in the Middle East and North Africa from 4.1 to 1.9 percent. Other regions also experienced changes, though much less dramatic. In addition to the large swings in regional poverty numbers, there are other concerns about the World Bank estimates: they tend to exaggerate the state of global poverty as they reflect little perceptible impact of economic growth. During the period 1987-1999, while there was a 24 percent increase in per capita income in the developing world, this led to a small 5 percent reduction in poverty. With rising population, it meant that the number of poor remained largely unchanged. According to the World Development Report 2000, there were 1.17 billion poor people in 1999 as compared to 1.18 billion in 1987. This relative lack of responsiveness of poverty to growth is in contrast with of the experiences in the earlier periods (Bourguignon and Morrison 2002).

² It may be noted that while the United Nations' MDG on poverty refers to dollar-a-day poverty, it does not, however, explicitly refer to the baseline year to which this one dollar is valued. One might naturally assume that this dollar refers to 2000, the year of the millennium declaration. However, that is really not the case. The UN seems to use whatever numbers are produced by the World Bank whose estimates of dollar-a-day poverty are now linked to the 1993 dollar.

This has led many to wonder whether this low growth responsiveness is the outcome of increasing global inequality or the simple reflection of the poor quality of poverty estimates. Partly out of these concerns, a number of economists have recently taken a close look at the global poverty estimates. These economists—who include Bhalla (2002); Sala-i-Martin (2004); Karshenas (2001, 2003); and Hasan, Quibria, and Kim (2003)—have come up with their respective dollar-a-day or two-dollar-a-day poverty estimates.

The focus of the Hasan-Quibria-Kim work has not been so much as to measure the magnitude of aggregate world poverty, but to derive quantitative conclusions about the impact of policies and institutions on poverty reduction. Hence they do not report the aggregate global poverty numbers but only individual country numbers. The same is the case with Karshenas. The poverty estimates of Karshenas for individual least developed countries were reported in UNCTAD's *The Least Developed Countries Report 2002*. The *Report* uses the national-income based measure to underscore the fact that the geographical pattern of poverty reduction is different depending on whether poverty measures are based on national-income accounts or household surveys. It shows that the poorest countries, particularly those in Africa, emerge as relatively poorer using national-income based poverty measures.

Both Sala-i-Martin and Bhalla have come up with their own global estimates of dollar-a-day poverty. As per the estimates of Sala-i-Martin (2004), the global head count of dollar-a-day poverty fell from 534 million in 1970 to 324 million in 2000. When this poverty threshold is raised to 1.5 dollars a day level, the number of poverty obviously increases. From 700 million in 1970, the number of such poor declined to 398 million by 2000. Similarly, Bhalla (2002) reports a rapid decline in dollar-a-day poverty over the 1980s and 1990s. According to his estimate, the global head-count of dollar-a-day poverty declined to 650 million or so in 2000. As is obvious, these alternative global poverty estimates of Sala-i-Martin and Bhalla are very different but both are a far lower than those of the World Bank which reported a figure of 1.2 billion in 2000. The following

table indicates the differences in estimates of poverty incidence among Bhalla, Chen and Ravallion, Sala-i-Martin.

Table: Alternative Estimates of Poverty Incidence by Region

	Bhalla		Chen-Ravallion		Sala-i-Martin	
	1990	2000	1987	1998	1990	2000
East Asia	31.3	6.0	26.6	14.7	10.2	7.7
South Asia	18.5	7.8	44.9	40.0	10.3	2.5
Sub-Saharan Africa	55.3	54.8	46.6	48.1	43.7	48.8
MENA	5.2	7.8	4.3	2.1	1.2	0.8
Latin America	5.3	5.2	15.3	12.1	4.1	4.2
Eastern Europe	0.0	0.0	0.2	3.8	0.4	0.1
Developing World	25.4	13.1	28.3	23.5	9.7	7.7

Notes: (i) MENA: Middle East and North Africa

(ii) PPP\$1.50 per day for Bhalla and Sala-i-Martin and \$1.08 for Chen and Ravallion

Sources: The columns representing the poverty estimates of Bhalla and Ravallion-Chen are taken from Ravallion (2002) and those representing the poverty estimates of those of Sala-i-Martin are taken from Sala-i-Martin (2004)

It may be noted in passing that Chen and Ravallion (2004) have in a recent paper come up, on behalf of the World Bank, with yet another new set of global poverty estimates

that cover the period from 1981 to 2001. Unlike in the earlier round [Chen and Ravallion(2000)] where they found an increase in the number of the world's poor during the period 1980 to 1998, this time, they have found a significant reduction—almost by 400 million-- in poverty between 1981 and 2001, “entailing nearly halving of the 1981 poverty rate of 40 % by 2001.” Such dramatic shifts of poverty numbers have often created more confusion than clarity for the international development community that seeks an understanding of the global poverty situation.

Why Do the Estimates Differ?

Although these non-World Bank studies may differ from one another in assumptions underlying the mechanics of their calculations, they have one thing in common with respect to the use of data. Rather than using the surveys, they all use the more readily available national accounts for mean consumption (or mean income) data.

And if these alternative non-World Bank estimates are to be believed, then many Asian developing countries have already achieved or are on the verge of achieving the MDG in poverty. The reason why these alternative poverty numbers are lower than those of the World Bank is that survey-based consumption numbers tend to be lower than those derived from national income accounts.

Though it may not be true of all countries, it is certainly true of large countries like India. In India, which accounts for a significant share of the world's poor, the divergence between the national accounts data and the survey data has become larger over time. In the 1950s and 1960s, the divergence between the two was no more than 5 percent, but by 1998 it reached more than 50 percent. Part of the discrepancy may arise due to the way consumption is measured in national accounts. Private consumption expenditure in national accounts includes more than household expenditures, e.g., the consumption of non-household private entities such as nonprofit organizations. Part of the discrepancy can also arise from measurement errors due to misreporting of consumption in surveys.

In this connection, two points are worth noting. First, despite claims to the contrary, the use of national accounts to estimate poverty is not a new practice. Such use has been made earlier by such esteemed authorities as the Indian Planning Commission and the Economic Commission for Latin America and the Caribbean to adjust survey data for poverty estimates³. Indeed, it is difficult to make an a priori judgment, as to which provides a better estimate of the mean private consumption—the surveys or the national accounts. Indeed, in an ideal world, the two estimates should be equal or at least close. The main impetus for using the national accounts has been a widely shared perception that surveys tend to underestimate consumption. On the other hand, those who favor the surveys argue that national accounts data are not meant for measuring poverty.

Moreover, if the survey-based consumption measures are inaccurate, so too would be the Lorenz curve estimates derived from the surveys. But then such Lorenz curve estimates are not available from the national accounts. Second, though all the alternative estimates use the national accounts, they are not exactly identical in every other detail. They have often differed in terms of data coverage, definition, and mechanics of poverty calculation.

How to Address the Measurement Problems?

While the problems underlying global poverty estimates are now fairly well recognized by academic scholars, the existence of drastically different global poverty numbers has been a source of enormous confusion for the international development community.

First, the principal source of confusion has been the data inconsistency between survey and national income data. To resolve the data inconsistency problems, Deaton (2001) has

³ Until this year (2005), for its poverty projection works—as reported in its *Global Economic Prospects*—the World Bank used data from both the surveys and national accounts—surveys for its poverty counts and national accounts for data on per capita consumption growth. However, in 2005, the World Bank has made a change in the method and this year's poverty forecast is based on the growth of the survey-based per capita consumption.

the following suggestions: (i) If two sources of data disagree, and as there is no basis to favor one over the other, then they should be combined to make a better estimate. This would mean a modest scaling up of the survey data by some weighted average of the national accounts statistics and the survey means, after correction for conceptual differences and coverage. (ii) Start a program of reconciliation between national accounts and survey data in a few countries, including India.

Second, the PPP numbers have been the source of tremendous volatility for global poverty estimates. To reduce this volatility, Deaton suggests that the dependence of the international poverty line on PPP exchange rates be eliminated. He further suggests that the current PPP poverty lines be subjected to detailed, local scrutiny, and be corrected in a way that would give them credence without a significant deviation from the \$1-a-day standard. The poverty lines thus arrived should be held fixed in real terms. In particular, he suggests updating the lines over time using domestic price indexes, without further reference to PPP exchange rates, on an annual basis. He further recommends that major improvements to PPP exchange rates be incorporated infrequently, no more than once a decade. The proposed method has of course its drawbacks. It might lead to growing deviations from an international standard and comparability. In addition, the detailed local judgment in fixing the local poverty threshold may not be as readily available in all countries as presumed.

Finally, indicators of global poverty are measures of performance and accountability for international development agencies like the World Bank. To serve this objective, many observers suggest that such data should be produced by an outside agency, independent of the World Bank. In national governments, statistics are often produced by separate entities, independent of the control of the policymakers whose performance is judged by those data. This principle of organizational independence should also apply to the international arena. However, there is at this moment no other international body than the World Bank that has the expertise and resources to measure and monitor global poverty. An alternative approach is to create an independent statistical entity, patterned a la the independent evaluation offices of the multilateral development banks, under the

aegis of the World Bank. The U.N., along with the other multilateral development banks, can perhaps assist national statistical agencies with their statistical capacities in carrying out household surveys as well developing uniform survey standards.

Concluding Remarks

If precision is the hallmark of a scientific enquiry, that is certainly not evident in the case of estimating global poverty, where estimates diverge—and wildly. Counting the world's poor is a much more complex and contentious task than it appears at first sight. The process is mired in many conceptual and statistical pitfalls. This has led some observers to argue that such efforts at global poverty counting be abandoned as these “global counts have little meaning and policy significance” as far individual countries are concerned (Srinivasan 2001). Such views notwithstanding, global poverty estimates are potentially useful comparative tools to guide, monitor, and measure international development. However, pending a satisfactory resolution of the issues that bedevil the poverty estimates, the efforts of the global community to measure and monitor development process would continue to suffer from concerns of credibility. It is something that the international community needs to address sooner rather than later.

However, despite the wide divergences among different estimates of global poverty, the common, happy theme that emerges from these estimates is that extreme poverty is certainly on the retreat. Though the MDG in global poverty is likely to be achieved in aggregate terms, the sad news is that this may not be achieved in a balanced manner in all parts of the world.

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