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Levels and Trends in Absolute Poverty in the World: What we know

and what we don't

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Levels and Trends in Absolute Poverty in the World: What we know and what we don't

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Abstract:

This paper critically reviews the recent changes to the Global Poverty numbers generated by the World Bank in 2008. While they have little impact on observed poverty trends and while there are good reasons to believe that the previous numbers were on weak foundations, the new numbers on levels of poverty in the developing world create new uncertainties und questions. In particular, there are conceptual issues involved in using one ICP round to update all poverty numbers and more empirical issues related to the particular results of the 2005 ICP round. This paper reviews these issues and finds that we cannot be very certain about levels of absolute poverty in the world and that the current method for generating these absolute poverty numbers is problematic and should possibly be abandoned. At the same time, poverty trends are much less affected by these methodological issues. The paper also discusses potential alternatives to the current methods and highlights their strengths and weaknesses. Unfortunately, there is no readily available alternative to the current method, though with some difficulty, such an alternative could be developed.

Introduction

At the Millennium Summit in 2000, the world community agreed on eight Millennium Development Goals (MDGs) to ensure poverty reduction and sustainable development for all. Poverty was seen in a wider context, encompassing income poverty, hunger, lack of educational opportunities, gender bias, morbidity, and premature mortality which are taken up in the first six of the eight MDGs. The first Millennium Development Goal, agreed to by the world community at the Millennium Summit in 2000, calls for the eradication of extreme poverty and hunger. The targets agreed are somewhat more modest and refer to halving, between 1990 and 2015, the share of the population living on less than $1 a day, and halving the proportion of the population who suffer from hunger. For these two targets, three indicators were chosen. For the first target, the World Bank has been charged to regularly produce the relevant indicator, i.e. the share of the population that is living on less than a $1 a day. For the second target, there are two indicators. The first is to be monitored by UNICEF and WHO and refers to halving the share of children under five years of age who are underweight, and the second is to be monitored by the FAO and refers to halving the share of the population who are below minimum recommended levels of dietary intake.

While all of these targets appear quite clear and the indicators chosen to measure them appropriate, there is in fact a great deal of uncertainty about both levels and trends in absolute poverty and hunger in the developing world. In particular, the two indicators for hunger show a very different distribution of underweight children and populations with calorie deficiencies. Neither indicator, in turn, correlate particularly well with mortality indicators and there appear to be significant regional anomalies, although one would presume a close correlation at the regional level. For example, caloric deficiency appears to be worst in the Caribbean, the share of underweight children worst in South Asia, and infant and child mortality worst in Sub Saharan Africa. Standard models to explain these phenomena cannot account for these anomalies. As discussed in detail in Klasen (2008), these problems therefore appear to be due to significant conceptual and empirical problems with both hunger indicators, their underlying data, and the assumptions made to arrive at these aggregate measures. As a result, there remains significant uncertainty about where 'hunger' is indeed worst and how the share of hungry people is changing over time. As these issues are dealt with exhaustively in Klasen (2008), I will not dwell further on them here. Instead the focus here will be on the first target and indicator, the share of the population living below $1 a day. The focus on this issue is particularly pertinent, as the World Bank has recently published extensive revisions to this indicator (Chen and Ravallion 2008). In fact, the revision of these numbers has been based on the derivation of a new international poverty line against which to measure levels and trends in poverty, as well as a recalculation of poverty levels and trends for all countries going back to 1981. Thus both the baseline for the first MDG target in 1990 has changed as well as the levels in each subsequent year, thereby also affecting the rate of progress towards this MDG. In this paper, I will critically review the way the World Bank measures this extreme poverty indicator, present key facts and figures on trends in extreme poverty using data from before and after the revision, and then focus on a critical appraisal of the recent revisions. While there is little reason to believe that these revisions seriously distort *trends* in extreme poverty in the developing world, I will argue that the uncertainty about levels in *absolute* extreme poverty is very high and that the recent revisions have done little to reduce this uncertainty and might have indeed increased it. In fact, given the difficulties to measure poverty using an international poverty line, I will suggest instead that it might be preferable to abandon the efforts to construct such an international poverty line and focus instead on creating consistent and comparable national poverty lines using a common set of methods that could in turn be

used to estimate levels and trends in absolute extreme poverty in the world. The chapter is organized as follows: in the next section I will discuss the $1 a day poverty indicator, its conceptual underpinning and its empirical derivation. The following section will then critically review the revisions that were introduced in 2005 and present key facts and figures that have been affected by this revision. In the following section I will discuss the implications of these criticisms. In the penultimate section, I will discuss advantages and disadvantages of an alternative procedure that has been proposed in the literature which has some promise but also faces significant obstacles. The final section concludes.

The World Bank's International Poverty Measure

Measuring poverty consistently in a single country is clearly a challenging task. Among the questions to be asked are the domain in which poverty is to be measured, whether a poverty line separating the poor from the non-poor is invariant across space and time, whether one should consider just the incidence or also the depth of poverty, and whether poverty should be measured at the individual or household level.[2] These are all complex questions that merit detailed discussions as well as high-quality comparable household survey data. For a poverty indicator that attempts to measure levels and trends in poverty in a comparable manner across all developing countries, matters are even more complicated as the inter-country comparability of poverty lines as well as the underlying data will be critical issues. Data availability and comparability issues will necessarily involve simplifications and short-cuts. In fact, until 1990 it was not possible to generate such comparative poverty figures as the coverage of household surveys in developing countries was simply too sparse. In the 1990 World Development Report (World Bank 1990) the World Bank made a first attempt to measure poverty in a comparable way using an international poverty line and measuring poverty for the year 1985. This was based on an international poverty line of the purchasing power equivalent of $1 per capita in 1985 prices. There have been two major updates of this poverty line, once in the World Development Report 2000/01, where the poverty line was shifted to $1.08 in 1993 prices and recently again in Ravallion, Chen, and Sangraula (2008), when it was shifted again to $1.25 in 2005 prices. The one proposed in 2000 became the basis for the first target of MDG1 at the Millennium Summit. The methods for establishing the poverty lines have largely remained the same in these three versions which will be described below.

Before turning to this point, it is useful to point out a number of implicit choices and simplifications that are inherent in this approach to the measurement of poverty. First, the focus is entirely on the income dimension of poverty. Whether such income poverty is correlated with other forms of deprivation or a multidimensional view of poverty consistent with, for example, Sen's capability approach is not considered here (e.g. Sen 1985; Klasen 2000). While this is clearly a narrow view, it is defensible in the context of the MDGs where other forms of deprivation are captured in the other MDGs as well as the hunger target of MDG1.

Second, the international poverty line is invariant in space and time[3] and thus constitutes an *absolute* poverty line that tries to capture the share of people who are in extreme poverty where basic physical survival and health is at risk. *Relative* poverty concepts that are based on claims that poverty depends on socially acceptable standards of living in a given society are

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[2]   For a discussion, see, for example, Sen (1984), Ravallion (1994), and Klasen (2000).
[3]   The poverty line is adjusted only for differences in prices across space and time.

also not considered here. Clearly, this is a debatable choice, but may be also defensible if the focus is on developing countries where absolute, life-threatening poverty is still a very serious problem. It would clearly be inappropriate to use such an approach to measure poverty in industrialized countries; indeed one may wonder whether it is appropriate for poverty measurement in upper middle-income countries such as Brazil, Thailand, Mexico, or South Africa where absolute life-threatening poverty is only affecting a relatively small share of the population while many more suffer from relative deprivation.[4]

Third, poverty depth is not considered in the target for MDG1, but all poor are treated the same and simply added up, regardless of whether their incomes are just below or very far below the poverty line. Considering the depth of poverty would indeed be preferable, but somewhat harder to communicate and also makes greater demands on the precision of the data.[5]

Fourth, the figures are per capita figures and do not account for differences in household size and composition which is likely to affect the needs of households as well as their ability to economize on resources. This will have the consequence that poverty in regions with large households and many children (such as many countries in Sub-Saharan Africa) is overstated relative to regions where household sizes and the number of children are small (such as China or South-East Asia).[6]

Lastly, inequality in intrahousehold resource allocation is not considered in these measures. If the per capita income of a household falls below the poverty line, everyone in the household is considered poor, even though some members might have better resource access than others. As a result, this approach is ill suited to examine the differential in poverty by gender or age group and it might indeed affect accurate poverty measurement (see Haddad and Kanbur 1990; Klasen 2007).[7]

While these are all short-comings of this approach to measuring poverty, some of which that could be addressed with available data, some of these choices appear defensible in the context of the MDGs where there was a need for a straight-forward comparable poverty indicator that would particularly capture levels and trends in extreme income poverty.

Bearing these methodological choices in mind, the big remaining questions are how this international poverty line is actually derived and how it is then used to measure poverty in each developing country so that poverty levels and trends can then be aggregated and compared. This is described in detail in Ravallion, Chen, and Sangraula (2008) and will be summarized here. Let me first turn to the construction of the international poverty line. In all three versions presented by the World Bank (1990, 2000, and 2008), the starting point was always the national poverty lines of a large sample of developing countries, expressed in their

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[4]   For a discussion, see, for example, Sen (1984). See Ravallion, Chen, and Sangraula (2008) for a defence of such an absolute approach to measuring poverty.

[5]   Most of the background papers by the World Bank team working on these numbers usually also prepares figures that consider the depth and severity of poverty. See, for example, Chen and Ravallion (2008)

[6]   In principle, this is also a solvable problem. The Luxembourg Income Survey which compiles comparable statistics mostly from OECD countries uses a common equivalence scale to deal with this problem. Possibly it would be harder to define such common equivalence scales for the very heterogeneous developing world.

[7]   There are also more detailed measurement questions such as the consistency of household surveys between countries and over time, as well as the consistency of income or consumption information in household surveys with the same information in national accounts which appear to suggest lower rates of extreme poverty and faster poverty reduction. See Chen and Ravallion (2008) and Bhalla (2004) for a discussion.

national currencies. In order to render them comparable, the results of the so-called International Price Comparison Project (ICP) were used to turn these national poverty lines into international prices (expressed in international $). The ICP rounds, which take place every 3-10 years, compare prices of a large basket of goods and services in many different countries to generate exchange rates that appropriately reflect purchasing power differences between countries (see below and contribution by Ward in this volume). These so-called purchasing power parity (PPP) exchange rates are used for the translation of national poverty lines into international $ in the hope that this approach will adequately reflect purchasing power differences and thus make these poverty lines comparable. For the 1990 exercise the 1985 ICP was used; for the 2000 revision, the 1993 ICP was used, and the latest poverty estimates are based on the 2005 ICP.

In a second step the poverty lines are plotted against per capita incomes and it is regularly found that among low income countries, the poverty lines, turned into international $, are very similar. The average of these poverty lines then is used as the international poverty line, which turned out to be $1.02 in 1985 prices in the 1990 World Development Report, $1.08 in 1993 prices in the 2000/01 World Development Report, and $1.25 in 2005 prices in the recent revision.

To measure poverty using these poverty lines, the following three steps are then undertaken. First, the international poverty line is turned into a poverty line in national currencies at the benchmark year using the PPP exchange rates from the particular ICP round (1985, 1993, and 2005, respectively). Second, this poverty line is adjusted using national inflation rates to generate poverty lines in national currencies backwards and forward in time for all years since 1990 (or even since 1981). Third, the share of the population living below this poverty line is then determined using national household income or expenditure surveys.

It is important to emphasize that in each three rounds of calculation (1990, 2000, and 2008), poverty rates were recalculated not only for the most recent years, but for all years since the beginning of measurement of poverty at the global level (where the first data point is 1981). Thus we have three sets of poverty estimates for 1985, one based on the 1985 ICP round published in 1990, one for the 1993 ICP round published in 2000, and another one based on the 2005 ICP round published in 2008. The resulting numbers for the same year are, in some cases dramatically different and it is not obvious to say which estimate is the most accurate one, an issue that will be discussed in more detail below.

Poverty Levels and Trends using the 2005 ICP Round

In late 2007, the World Bank made available the new PPP exchange rates from the 2005 ICP survey (World Bank 2007). Not only do they represent a more up-to-date set of price comparisons, but this round of the ICP was more comprehensive than all previous rounds, and particularly included China for the first time. In August of 2008, it then published new poverty estimates for developing countries going back to 1981 based on these figures. Table 1 compares the share of the population below $1.08 a day in 1993 prices by region and from 1990 to 2005 with the new figures which are based on the $1.25 poverty line in 2005 prices. As can be readily seen from the table, there are dramatic differences in levels of poverty in many regions of the developing world using these two methodologies. Changes are particularly extreme in East Asia and the Pacific, but also quite large in Sub Saharan Africa, the Middle East, and South Asia. In China, using the 2005 ICP suggests that 60% of the population lived in extreme poverty 1990, compared to 'only' 33% using the previous ICP. This largely drives the results for all of East Asia. In India and in Sub-Saharan Africa, extreme poverty is now believed to have been much higher in 1990 than was previously

thought. This, of course, has direct implications for the first target of MDG1 where the halving of poverty uses 1990 as a baseline. When the goal was agreed in 2000, based on the 1993 ICP, it implied that the share of the extremely poor should fall from about 29% of the population in developing countries in 1990 to half that, i.e. 14.5% in 2015. Using the 2005 ICP for this goal implies that now extreme poverty, expressed in 2005 international prices, needs to fall from nearly 42% in 1990 to 21% in 2015. Thus halving poverty is now based on a much larger share (and correspondingly, number) of poor people.

But also the most recent observations show large discrepancies. Poverty in 2005 is believed to be about ten percentage points higher in South Asia and Sub Saharan Africa using the 2005 ICP than the 1993 ICP suggested. In all of the developing world, the 2005 ICP suggests that some 26% of the population suffer from extreme poverty in 2005, compared to only 19% when the 1993 ICP is used.

This not only affects poverty rates, but correspondingly the absolute number of people who live in extreme poverty. While the 1993 ICP round suggested that 1.5 billion people lived in extreme poverty in 1990 and this figure dropped to 930 million in 2005; the 2005 ICP implies that the number of extremely poor was 1.9 billion in 1990 and about 1.4 billion in 2005 (Chen and Ravallion 2008). These are large differences, suggesting that we have about 50% more extremely poor people in the world.

While the differences in poverty levels induced by the new revision based on the 2005 ICP are very large, the differences in poverty trends since 1990 are remarkably small, a point also emphasized by the World Bank (Chen and Ravallion 2008). The recent revision does not change the direction of poverty trends in any region or for the developing world as a whole; poverty rates globally are about 37-38% lower in 2005 than in 1990, regardless of the data used. Also the size of poverty reduction in the different regions, and the developing world as a whole, changes remarkably little. Poverty reduction in China, and East Asia as a whole, remains very rapid, poverty reduction in South Asia also remains sizable, and continues to be the case that poverty reduction in Latin America, Eastern Europe and Central Asia, and Sub Saharan Africa was very small, and mostly concentrated in the period after 2000. As a whole, the figures thus suggest relatively little change to the assessment of overall progress in the first target of MDG1. Regardless of whether we use the old or the revised figures, the developing world as a whole seems to be on track to halving extreme poverty. Using 1993 prices, the poverty rate fell from 29% in 1990 to about 18% in 2005; using 2005 prices, the decline is from 42% to 26%; in both cases reaching the goal by 2015 is clearly within reach. At the same time, both sets of estimates suggest that this overall positive development is largely driven by over-achievement in poverty reduction in East Asia and quite good progress in South Asia. In contrast, Sub Saharan Africa is highly unlikely to reach the goal, and it also highly uncertain that Latin America or the Middle East will reach it.

Table Fehler! Kein Text mit angegebener Formatvorlage im Dokument.**-1: Share of population suffering from extreme poverty, 1993 and 2005 ICP Rounds**

Region	1990		1996		2002		2005	
Poverty line	1.25 (2005)	1.08 (1993)	1.25 (2005)	1.08 (1993)	1.25 (2005)	1.08 (1993)	1.25 (2005)	1.08 (1993)
East Asia and Pacific	56.0	29.8	37.1	16.1	29.6	12.3	17.9	9.1
Of which China	60.2	33.0	36.4	17.4	28.4	13.8	15.9	9.9
Eastern Europe and Central Asia	1.5	0.5	4.5	4.4	5.6	1.3	5.0	0.9
Latin America and Caribbean	10.7	10.2	11.5	8.9	10.1	9.1	8.2	8.6
Middle East and North Africa	5.4	2.3	5.3	1.7	4.7	1.7	4.6	1.5
South Asia	51.1	43.0	46.9	36.1	43.8	33.6	40.3	30.8
Of which India	51.3	44.3	46.6	39.9	43.9	36.0	41.6	34.3
Sub-Saharan Africa	54.9	46.7	57.5	47.7	52.7	42.6	50.4	41.1
Total	**41.6**	**28.7**	**34.8**	**22.7**	**31.0**	**20.1**	**25.7**	**18.1**
Total excluding China	35.2	27.1	34.2	24.5	31.9	22.2	28.7	20.7

Note: The first column refers to the share of the population below the new poverty line of $1.25 a day, the second one to the old poverty line. The differences in the figures are, to a very small degree, also due to changes in survey data; also note that the $1.08 figures in the 2005 column refer to 2004. Sources: Chen and Ravallion (2008), Chen and Ravallion (2007).

Given the process of arriving at these numbers, it is not surprising that the revisions only have a large impact on poverty levels, but not on trends in poverty reduction. All that has changed for poverty trends at the national level is that the poverty line has been changed at the benchmark year and then the same national inflation rates have been used to adjust the poverty line for each year between 1990 and now. Thus there has been a consistent shift of the poverty line across all years (either upwards, as in the case of most developing countries, or downwards, as in the case of very few developing countries); since the household surveys have not changed that are used to determine poverty using these adjusted poverty lines, it is not surprising that the trends are hardly affected. Trends in poverty using a consistent poverty line are mostly driven by changes in average incomes and the income distribution in national currencies rather than the location of the poverty line, and in this respect nothing has changed.[8]

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[8] They will have a modest impact, however, as now these trends are evaluated at a different national poverty lines which has consistently been shifted upwards or downwards for all years, and we know formally from the work of Bourguignon (2003), Klasen and Misselhorn (2007), among others, that the location of the poverty line will affect the pace of poverty reduction; this is due to the fact that the density of incomes around the poverty line clearly affects the impact (distribution-neutral) growth will have on poverty reduction: if the density is very high around the poverty line, poverty reduction (measured in percentage points) from growth will be larger. Measured in percentage changes (rather than percentage point changes), poverty reduction will be higher if the density is low and one is in the left tail of the income distribution (where a percentages reduction of poverty of 50%, say from 2 to 1%, is quite easy to achieve). This is nicely demonstrated in the Table: percentage point poverty reduction is higher using the 2005 ICP where poverty levels are higher and, given lognormality of income distributions, moved generally closer to the higher density of incomes in most countries; relative poverty change is virtually the same using both ICPs but this is partly due to the fact that the 1993 ICP uses data

Thus the new findings suggest that poverty is much higher than we previously thought, particularly in China, but also in Africa and India. At the same time, the new numbers have little impact on what we knew about the pace of poverty reduction and the progress towards meeting MDG1. Here the finding remains that progress on the whole looks quite promising, but is highly heterogeneous, with many regions projected not to meet the goal of halving extreme poverty.

In this context, one should also point that below the surface of even these uneven regional trends lie more disconcerting facts that were highlighted in last year's Global Monitoring Report on the MDGs, produced by the World Bank (World Bank, 2008). In particular, two very disconcerting facts are hidden beneath the figures in Table 1. The first is that more than half of the 149 developing countries included in the assessment of MDG progress lack the necessary data to assess whether there has been any progress in poverty reduction. Two groups of countries predominate among those with no data. One group is very small countries such as the many small Island states in the Pacific and the small African countries where regular household surveys are not undertaken. The other group consists of unstable countries where violence, civil wars, state collapse, or extremely weak governments prevent the collection of data. While the first group is unlikely to affect overall trends by much, the second group includes some larger countries such as Afghanistan, Iraq, Somalia, Myanmar, or Eritrea where one can suspect that poverty trends are not favourable and this could have a noticeable effect. But the data represented in Table 1 include information from countries that comprise 90% of the population of developing countries (Chen and Ravallion 2008), so that the overall regional and global trends are not seriously affected by these missing observations. It remains the case, however, that it is serious problem that one simply lacks the data on poverty levels and trends for the majority of developing countries; this is a great challenge for the countries concerned as well as the international community to remedy this very unsatisfactory state of affairs.

The second disconcerting fact is that of those countries where information is available to monitor poverty trends, over 60% are, at current trends, actually off track to meet the poverty reduction goal (World Bank, 2008). If we take a country perspective, the news on progress in reducing extreme poverty is therefore actually quite bad: The vast majority of countries in the world either are unlikely to meet the target or lack the data to monitor progress. Conversely, the overall positive trend is entirely dominated by the good poverty reduction performance of a number of populous developing countries, most notably China, India, Indonesia, Bangladesh, and Vietnam.

Nevertheless the big question remains what to make of these large revisions in poverty levels in many developing countries. Similarly, the general approach of periodically revising these international poverty lines to generate a whole new time series of poverty estimates should be scrutinized further. This is taken up in the next section.

Problems and Open Questions associated with the Recent Poverty Revisions

There are two different sets of questions associated with this approach to measuring extreme poverty in the developing world. The first set asks whether conceptually the current approach to measuring and periodically revising poverty in the developing world using this procedure is

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from 2004 while the 2005 ICP uses data from 2005. As shown in Chen and Ravallion (2008), global poverty using the 1993 ICP fell to 17.2% in 2005, a larger percentage reduction (40%) compared to the 2005 ICP (38%).

a promising way to accurately reflect levels and trends in absolute poverty. This is a subject on which there has been some debate in the past (e.g. Reddy and Pogge (2009); Ravallion 2009); the focus here will not be to repeat this debate but reflect on the conceptual issues in light of the recent drastic revisions. The second set of questions involves potential empirical problems with the two ICP rounds in 1993 and 2005 that differ so much in their conclusions on relative price levels, and thus on poverty levels. This is also a topic that is discussed in more detail by Michael Ward in his contribution to this volume, but I want to weigh in on some of these issues. I will deal with these two issues in turn.

On the conceptual side, I want to address two difficult issues. The first is whether the PPP exchange rates generated by the ICP process are appropriate for the comparisons of the purchasing power of the poor. This is an issue central to the critique of Reddy and Pogge (2009) and, in principle, it would indeed be preferable to only consider those items in the construction of PPP exchange rates that are of relevance to the poor. This was seen by all participants in these debates as an important way forward and several attempts have been made to move in this direction.[9] The most recent was by Deaton and Dupriez (2008) who constructed consumption baskets close to the poverty line and use those baskets to compare prices. This is conceptually superior, but data-intensive and only possible for a small set of countries. According to results presented in Chen, Ravallion, and Sangraula (2008), the empirical differences between these two sets of results in terms of setting a poverty line are rather small. This will not necessarily mean that this issue has no importance, however, as there is a second related point one must bear in mind. The overall PPPs that are used for the translation of the international poverty line into national currencies can be significantly affected by goods and services not heavily consumed by the poor and this can in turn affect levels of poverty. For example, Heston (2008) argues that in the 2005 ICP the biggest reason for the drastic downward revision of PPP adjusted per capita income (and thus the large upward adjustment of poverty levels) was due to changes in the assumptions about the productivity of government services. While this is an important issue to consider when comparing GDP levels, it is less clear that it a relevant factor to consider when assessing poverty as the poor are arguably less affected by this change (see Reddy 2008). Similarly, Ward argues in his contribution that the finding that China was much more expensive than previously thought is based on baskets of goods that are internationally comparable, but largely out of reach of the poor so that also here the question is whether this change should really impinge on poverty measurement. The choices made in the 2005 ICP round to deal with these two difficult conceptual issues suggest that income levels are underestimated and poverty is overestimated, an issue to which I return below.

The second, equally difficult question relates to the intertemporal use of a single cross-country price comparison. As explained above, the poverty estimates from 1981 to 2005 are now based on the 2005 PPP exchange rates which is now used, in combination with national inflation rates, to derive poverty lines for each year. As has been pointed out by many scholars working on these price comparisons, the ICP rounds only provide valid comparisons of purchasing power adjusted GDPs at one point in time, the benchmark year. Thus the use of the 2005 price comparisons to compare poverty levels in 2000, 1995, let alone 1981, is not really an appropriate use of these comparisons. The reason is that the 2005 comparison is based on the global production and demand of goods available in 2005 and global demand

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[9]   See, for example, Reddy, Visaria, and Asali (2008) for one such example where the approach is to use define a common conception of poverty based on nutritional adequacy and then compare poverty levels in three countries using this metric.

and availability of goods changes over time which would affect price comparisons. While it appears rather innocuous to use the 2005 ICP to assess poverty levels in 2003-2006, it seems quite problematic to use these prices for comparisons of poverty levels in 1990, let alone 1981 when the world economy, the structure of world demand, and the availability of goods was quite different. This problem will keep getting worse. The next ICP round is planned for 2011 and it seems highly dubious to base comparisons of poverty levels in 1990 or earlier on the assessment of global prices in 2011.

The obvious alternative to this approach would be to use all of the benchmark comparisons years (i.e. 1985, 1993, 1996, and 2005) in an assessment of purchasing power parity exchange rates for different time periods. This is the approach that so far has been taken by the various versions of the Penn World Tables provided by Summers, Heston, and Aten which provide PPP-adjusted GDP per capita levels.[10] There is a vigorous debate (in the context of the Penn World Tables, based on the different ICP rounds) on whether this approach is appropriate as this approach uses information from national accounts evaluated at national prices and mixes them with the international prices at the benchmark years (see Johnson, Larson, Papageogiou, and Subramanian, 2009).[11]

The very significant problem with applying this approach to poverty measurement is that it will lead to strong deviations of trends in poverty from what we know from national statistics.[12] The extreme case would be China again. If we believed the 1993 ICP and the 2005 ICP to be true reflections of Chinese prices relative to world prices, then poverty would have fallen in China between 1993 and 2005 by only 10 percentage points (from 28% to 16%), and from 1996 to 2005 poverty would not have hardly been reduced at all (falling only from 18% to 16%, see Table 1) which is entirely inconsistent with the massive growth and considerably poverty reduction using national data which show much faster poverty reduction.[13] A second problem with such an approach would be that the earlier ICP rounds were much more incomplete, omitting large countries such as China in all previous rounds and India in several rounds, so that it is unclear what estimates to use for these countries. A third problem is that there reasons to believe that the earlier rounds were of lower quality than previous ones so that one might reasonably want to distrust some of their results (see Heston 2008; Ravallion, Chen, and Sangraula 2008).[14]

So one is faced with a rather unpalatable choice between two problematic approaches: Either we rely on a single cross-country price comparison in 2005 and pretend it tells us a lot about how relative prices were 15 or even 25 years ago across the world, which is the current

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[10] They do not only consider the benchmark years, but also national growth rates and try to render the two pieces of information consistent. For details see the documentation in Heston, Summers, and Aten (2006).

[11] In addition, the switch of baseline year can have a significant impact on both levels and growth rates of GDP in developing countries as was also demonstrated by the same authors. This, in fact, was one reason to change the methods of generating the Penn World Tables between version 6.2 and 6.3. The latter is more robust to changes in the benchmark year. It is also far from clear that the solution proposed by the Johnson et al., to just use the benchmark years for the calculation of growth rates, would be a satisfactory alternative, either conceptually or empirically.

[12] The same was true if the Johnson et al. approach was used, where only the benchmark years are actually used; see the China example just discussed.

[13] China did not participate in the 1993 ICP so its PPP exchange rates are based on estimates which may well be part of the problem for the drastic revision.

[14] These arguments would also caution against just relying on earlier rounds of the ICP for global poverty measurement.

approach, or we use the different comparisons and have to contend with the inconsistencies, the coverage, and the differential quality. Both choices appear to be quite problematic.

These conceptual problems appear to be really quite serious and they will get worse over time. Imagine that we are in 2015 where there has yet again been another ICP round and we will first have to generate a new international poverty line yet again, then produce an entirely new time series of poverty rates going back all the way to 1990 to determine what the new levels of poverty are and whether indeed we have met the goal.

Apart from these conceptual problems, there are also some measurement problems to deal with in this particular ICP round and the biases it might have produced. There are several reasons to believe that in general the quality of the ICP is higher than in previous rounds. The country coverage was wider, there were more consistency checks, and it appears that the data gathering and analysis was more thorough (see, e.g. Heston 2008; Ravallion, Chen, and Sangraula 2008). At the same time two particular empirical problems appear to arise. The first, also discussed by Ward in this volume and also confirmed by Heston (2008), relates to the choice of goods whose prices are being compared. There is the inherent tension between international comparability and national representativeness of goods. Ideally the goods whose prices are to be compared should be both highly comparable internationally (i.e. essentially the same good in all countries) but also representative of purchasing habits of a population. In rich countries this is likely to be the case (e.g. one can compare the prices of identical shirts of the same popular brand that are both available and widely used). When we compare prices between a rich and poor country, the tension will arise. We will probably be able to find identical goods in both countries but in the poor country the good is likely to be consumed by a rich and import-oriented elite and thus not representative of the population (e.g. an international brand-name shirt will be bought only by a select group in China). One could alternatively replace the good in a poor country with a cheaper, domestically produced substitute which would be more representative of the population, but inherently less comparable to the good in the rich country. As with the conceptual problems, there is no easy way to resolve this tension and choose the 'correct' answer. The claim by Ward is that in the 2005 ICP one tended to emphasize international comparability over national representativeness, and this led to some of high reported prices in countries such as China, India, or parts of Sub-Saharan Africa, and thus the associated higher poverty levels, a claim also supported by Heston (2008), an adviser to the 2005 ICP round. This would essentially mean that poverty is overstated in these countries in the 2005 ICP round as the 'comparable' national goods are actually more affordable, leading to higher purchasing power and lower poverty.[15]

As a result, we are left with a great deal of uncertainty about the levels of extreme poverty and it appears to me that the conceptual and empirical problems are so severe that we can place relatively little confidence in the reported *levels* of poverty using these international poverty lines. To be sure the reported *trends* in global poverty are much less questionable where the changes implied by each revision have been always relatively modest due to the reasons described above.

Is there an Alternative Approach to Measure Global Poverty?

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[15] A related issue refers to the already-mentioned assumption about the productivity of government services where Heston (2008) argues that the adjustments were possibly too large for China and India, thus making these countries look poorer as a whole, again leading to higher poverty levels there.

Given these problems, the question arises whether there is an alternative approach to measuring extreme poverty at the global level. In principle there is and it is an approach that is already widely used, including by the World Bank, though not usually for measuring poverty at the global level. The approach, which has also been recommended by Reddy (2008) and applied as an example in Reddy, Visaria, and Atali (2008) consists of creating *national* poverty lines using a procedure that is internationally consistent so that then poverty measured in this consistent way could be aggregated across countries. The most common way to generate consistent poverty lines is to link them in some form for a nutritional requirement. There are principally two common ways suggested in the literature to this (see Ravallion, 1994, 1998): The food-energy-intake method and the cost of basic needs method. Briefly, the former asks the question what incomes are empirically needed to allow households to have a specified number of calories per capita (or adult equivalent). This can most easily be done by running a regression of caloric intake on incomes (or expenditures) to identify the required expenditures to meet a certain caloric norm; often actual caloric intake of household members is not available, so instead expenditures on food is converted into calories and this is used as the proxy for caloric intake. These regressions can be done separately for different areas. India's poverty line is essentially based on this approach and is based on the incomes that in 1973/74 were sufficient to purchase an adequate diet in rural and urban areas (see Subramanian2005, Reddy 2007). These poverty lines can then be updated over time by either come consumer prices index (possibly an index where the basket reflects purchasing habits of the poor), as done in India, or simply the exercise can be redone in each (survey) year, as apparently done in Bangladesh where a new poverty line is generated using the expenditure-food intake relationship.

The second approach, the cost of basic needs bundle, is closely related but proceeds somewhat differently in setting the poverty line. This method is now widely used in many developing countries and is often the one used by the World Bank in its poverty assessments. It first chooses a reference group of probably poor people (e.g. the bottom third of the income distribution), examines the level and type of food expenditures to generate a food basket that determines the shares of food types in that basket. Then the food basket is translated into calories. The (food) poverty line is then the amount of food expenditures needed so that this basket will provide a pre-defined caloric content (i.e. the food expenditures in each group are proportionately scaled up or down across the entire basket until they deliver this caloric norm). Allowance for non-food items is then made by either taking the average non-food share of those households whose food expenditure equals the food poverty line (upper limit) or whose total expenditure equals the food poverty line (lower limit). [16] Updating of the poverty line can be done in three ways, either by simply using a consumer price index (or one relevant for the poor), or by using the specific prices for the items in the food basket (and either keeping the non-food share fixed or using a new survey to allow it to vary), or by redoing the entire exercise using a new household survey. Most often, the second method is used, i.e. updating the prices of the food basket and (while most often) keeping the non-food share fixed.

Using these nationally-set poverty lines and poverty rates using either of these methods, one would examine levels and trends in poverty, country by country, and then simply add up

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[16]   Reddy, Visaria and Asali (2008) in their proposal for comparable poverty lines using such an approach rely on this method in their illustrative analysis.

poverty across countries, without reference to an international poverty line. To the extent that these approaches are indeed fully comparable across countries (and time) and all measure how many people have insufficient incomes to consume enough food, one would this way generate a global poverty estimate of the poor. This estimate would obviate the rather complex conceptual and empirical problems inherent in the current PPP-based international poverty lines.

This approach is, in principle, rather straight-forward, possible with available household survey data, and already this method is being used in many developing countries to analyze poverty. In fact, by collating poverty numbers from the countries that use this method already, one could make a ready comparison of what poverty levels and trends this generates and compare that to the current approach using the international poverty line. Redy, Visaria, and Asali (2009) do this for three countries (Nicaragua, Vietnam, and Tanzania) and show that the poverty rates arrived at by the cost of basic needs method can generate quite different results than those generated by the international poverty line. Clearly, this approach has some merit and deserves further scrutiny.

At the same time, there is a host a quite serious conceptual and empirical issues that would need to be tackled. In fact, they may be so severe that the use of this alternative might generate its own inconsistencies and implausibilities. I will just highlight the most important issues. First of all, as discussed above, consistency will require that one consistently uses one of the two approaches outlined above and also uses consistent choices when actually implementing them (e.g. on updating, on the reference group for the food basket, etc.). With enough international coordination, achieving consistency in principle is possible. But it is not obvious on what approach this international poverty measurement should converge on. There are serious problems with each of the approaches taken. The problems with the food-energy intake method are nicely illustrated by Wodon (1997) in Bangladesh. In urban areas, much higher expenditures are apparently required to achieve the caloric norm than in rural areas. Does this merely reflect higher prices in urban areas? Or greater need or preferences for non-food items? To the extent it is tastes, should that be reflected in a poverty line? Updating can create further problems as the comparison between India and Bangladesh illustrates. As shown by Wodon, redoing the food-energy intake method leads to a *falling* poverty line between 1985 and 1989 as the amount of income needed to reach the caloric norm has fallen. Wodon convincingly shows that this is related to the fact that falling incomes lead to a substitution to cheaper calories and thus the falling poverty line is actually a result of households reacting to higher poverty; this should scarcely be considered so redoing the analysis can lead to serious problems. Not redoing the setting of the food-energy intake poverty line can lead to serious problems as well, as the Indian case demonstrates. The poverty line developed in 1983 (and confirmed in 1993) was sufficient to purchase 2400 calories per adult in 1973/74. By 1999/2000, (rural) people at the poverty line were only purchasing less than 1900 calories (see Pattnaik, 2004, Subramanian, 2005; Reddy, 2007), suggesting that, in some sense, the Indian poverty line is at a level where households are no longer adequately nourished.[17] This would generate a case for updating which would lead to a much higher poverty line in India today, and consequently much higher poverty levels (and much less poverty reduction in recent decades).

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[17] It is quite unclear why households at the poverty line are consuming too few calories. Clearly, it is in part related to them consuming higher-quality calories than before, as well as reducing their food share (Reddy, 2007; Subrmanian, 2005); whether this a free choice households are making that should not be considered in a poverty analysis, or whether this is due to more pressing non-food needs and/or the unavailability of cheaper calories that should be reflected by adjusting the poverty line upwards, is an open question.

But also the CBN method has serious questions and short-comings. First, it is not obvious who is supposed to be the reference group for the poverty food basket in a country. Should it be people close to the presumed poverty line? Or all people likely to fall below a presumed poverty line? These are not innocuous choices and could seriously affect poverty levels. More importantly for international comparisons of poverty lines is the question whether these food baskets (as well as the non-food requirements at the poverty line) should be determined separately for each country, or established internationally. Reddy, Visaria, and Asali (2009) determine them separately for each country but this might go against the idea of developing an absolute standard that is comparable across countries. In richer countries, the presumed poor will likely consume more expensive calories and have higher non-food needs than in poorer countries; as a result deriving the poverty line for each country contains an element of a relative poverty line, driven by prevailing consumption patterns.[18] Conversely, if one chose a common food basket, it is unclear whether this could adequately account for specificities of climate, food availability, specific needs, etc.

Moreover, updating presents similar problems. If one simply updates using prices from the food basket, the problem identified in India would still largely hold. The reason the people at the poverty line are in 2000 only consuming less than 1900 calories is only to a small extent due to the fact that cereal prices rose faster than the price index used for updating the poverty line (Subramanian, 2005; Reddy, 2007). It is more related to the fact that household apparently switched their consumption habits, turning to more expensive calories and more non-food items. Conversely, redoing the poverty line with each new survey puts into question the inter-temporal comparability of the poverty estimates which each time are based on a different basket of goods. In particular it is unclear whether the driver of the changed baskets are income effects (positive or negative) which might make this again somewhat of a relative (rather than absolute) poverty standard. For international comparisons, the problem will naturally arise that some countries would then frequently update their poverty line, while other do it more rarely (as surveys are done more infrequently) and it is not always clear then which survey estimates should be compared. A benchmark year approach, as done in the ICP, might be one was to deal with this.

There are also a host of empirical issues to consider. They include problems of comparability of questionnaires of household surveys, different extent of measurement error in food expenditures that would affect the construction of national poverty lines, the increasing (and internationally highly variable) difference between mean consumption in household surveys and consumption as reported in the national accounts are the most important ones. Also here, the devil is in the detail as has been shown in Deaton and Kozel (2005) who survey the great debates on poverty in India where these issues are the center of the debate. In particular, the issue of measurement error and incomparability of survey instruments (and survey implementation) across countries and time are the most serious empirical drawbacks of moving to such an approach to measuring global poverty.

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[18] Of course, there might be a good justification for doing so. As Reddy, Visaria, and Asali (2009) want to create a capability-based poverty line based on the capability 'adequate nourishment', fulfilling that capability might indeed require more resources in a richer country than in a poorer one, making it still 'absolute' in the space of capabilities while relative in the space of resources (see also Sen, 1984 on that). Whether the use of a country-specific CBN to derive a poverty line makes it fully comparable across countries in this capability view, is also open to question as many factors might affect food and non-food consumption that might be unrelated to absolute needs related to the nutritional capability.

Clearly, this alternative approach of using consistent national poverty lines to measure poverty at the international level would generate a host of serious conceptual and empirical issues. At this stage, the relative importance of the many issues raised as well as the most important options to address them, are unclear. Thus a first step would be to investigate the feasibility of this approach in much more detail. Also, it is clear that implementation of such an approach would require a totally different set-up of poverty analysis than is currently in place. In particular, it would either require extensive international coordination and standardization on poverty measurement approaches, which is currently largely absent, or would require an international agency, such as the World Bank, to take all these household surveys and build up comparable national poverty lines for as many countries as possible. Both paths are not entirely infeasible. The first route has been chosen in the creation of the System of National Accounts where all countries of the world agreed to specific rules for the calculation of national income, GDP, and other aggregate statistics. The size of the effort was and remains huge, and something rather similar might be needed to implement internationally coordinated poverty measurement. And the second route the World Bank has already gone down quite far in its work on global poverty as well as its work on national poverty. But currently its work on national poverty is highly decentralized and the critical conceptual and empirical issues discussed above have not been addressed. Doing so would require a much more determined effort, resources, capacity, and commitment than is currently in place at the Bank, where the global poverty measurement is driven by a tiny unit in the research department and the national poverty measurement is largely done in a decentralized fashiop by country teams.

In short, it would not appear to be entirely infeasible to try out such an alternative approach. If implemented successfully, such an approach would obviate the need for the periodic drastic revisions of poverty levels and would also present a more accurate picture of poverty trends over time. To be sure, the conclusion on poverty trends would, as discussed above, likely not be substantially different from those based on the current method favoured by the World Bank, but they would be based on a better foundation and give us a better grounding on comparative poverty levels.

Conclusion

The rather drastic revisions of global poverty have revealed significant problems in the measurement of levels and trends in global poverty. In this paper, I have discussed the nature of these problems and highlighted some potential solutions. It appears that the current method of calculation poverty using a regularly revised international poverty line is beset with considerable conceptual and empirical problems. Instead, it is well worth considering an alternative where global poverty is monitored using internationally consistent national poverty lines. It is time that such an approach was actually investigated more thoroughly whether the conceptual and empirical problems inherent in this alternative approach could be handled.

At the same time, it is important to highlight that there are other, in many ways, more substantive problems that the measurement issues that were the focus of this paper. First, for most countries we do not have any data on poverty so are unable to say much about levels and trends. Second, the vast majority of countries, particularly in Sub Saharan Africa, but also countries in other regions of the world, are currently far from reaching the first MDG by 2015. The currently worsening global economic environment will make further extreme poverty reduction even more difficult (see Bourguignon et al. 2008). Thus the focus in terms of policy has to be on those countries to ensure that they are able to make progress towards the reduction of extreme poverty. As discussed in great detail in Bourguignon et al. (2008)

this will require changes both in national policies as well as the international environment and aid policies.

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