**Crying Wolf on Poverty: Or How the Millennium Development
Goal for Poverty Has Already Been Reached**

By

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Abstract

One of the most important development goals is the reduction in absolute poverty to 15 percent by 2015. This and related development goals have been agreed upon by governments and the UN system, and have been labeled the Millennium Development Goals. In my recently published book, *Imagine There's No Country: Poverty, Inequality, and Growth in the Era of Globalization,* I had documented how the poverty reduction goal had already been reached by 2000, the very year of formulation of the goals for 2015. In a critique of my study, World Bank and its main poverty analyst, Martin Ravallion, question the authenticity of the data, assumptions, and methods used by *Imagine.*

In fact, data and definitions account for only an insignificant amount of the difference in the poverty estimates of the World Bank and *Imagine.* The major explanation for the higher World Bank poverty rates is found to be due to a lower *growth* estimate of per capita expenditures, and especially lower compared to the growth estimate obtained from national accounts data (*Imagine*). This lower growth, 10.4 percent over 11 years, 1987–1998, is based on household survey means (World Bank data). An associated, and surprising, finding is that while poverty estimates are accurately reproduced, there is a big divergence between the published growth rate of 10.4 percent and the "reproduced" survey growth of 7 percent.

Notwithstanding this major uncertainty about the World Bank data or its growth and poverty results, all the major findings of *Imagine* are faithfully reproduced using only World Bank data. Further, an extension of the World Bank poverty measurement method also yields the result that the MDG of poverty reduction has been reached. Finally, using the recently released 1996 PPP data, poverty in 2000 was below 15 percent for *all* methods, including the flawed World Bank poverty measurement method.

Introduction

In *Have We Already Met the Millennium Development Goal for Poverty?* the World Bank's main poverty analyst Martin Ravallion (hereafter Ravallion) has raised several issues pertaining to my recent book *Imagine There's No country: Poverty, Inequality, and Growth in the Era of Globalization* (hereafter *Imagine)* published by the Institute for International Economics, Washington, DC. In addition, the World Bank's recent publication, *Global Economic Prospects* (World Bank GEP 2003), raises some of the same questions as Ravallion.

In *Imagine*, I had offered an alternative to the World Bank method of determining the magnitude of poverty and its change over the 50-year period, 1950–2000. The years 1980 to 2000 were singled out for special analysis as the globalization that has taken place over this period has been the subject of much controversy. Among the conclusions reached were that world inequality and poverty had declined during the globalization period; indeed, *world poverty had declined by a magnitude greater than any other 20-year period in history*. The *Imagine* results also indicated that one of the principal Millennium Development Goals (MDG)—that of halving the incidence of world poverty from 30 percent in 1990 to 15 percent by 2015—had already been reached in 2000. These conclusions are questioned by the World Bank (GEP and Ravallion) on the grounds of bad data or misinformed analysis, a critique not unlike that offered by Milanovic (2002) against Sala-i-Martin's (2002a, b) study on world inequality—a study which, incidentally, reaches conclusions very similar to *Imagine*.

The focus of attention in this reply are the poverty numbers produced by the World Bank and *Imagine*. While *Imagine* analyzes the level and trend in poverty over each of the last 50 years, the World Bank has presented estimates for only selected years between 1987 and 1998. The major differences with the World Bank results lie in the estimates for the 1990s; in particular, for the period 1987 to 1998. The World Bank estimates suggest that poverty (between 1987 and 1998, $1.08 poverty line, 1993 PPP prices) in the nonindustrialized world declined by only 4.8 percentage points—from 28.3 to 23.5 percent. In *Imagine*, from a higher initial poverty level of 29.3 percent in 1987, the poverty decline was reported to be 13.2 percentage points—more than two and a half

times higher than the World Bank, and a poverty level equal to 16.1 percent in 1998, and 13.1 percent in 2000.

Thus, according to the World Bank, about a quarter (23.5 percent) of all residents in the nonindustrialized world—or about 1.2 billion people—lived in poverty in 1998. In sharp contrast, according to *Imagine*, just 800 million people were poor—and this number had been further reduced to 670 million in 2000. These differences have important policy implications, particularly with regard to the role of economic growth in poverty reduction. The question for all of us is *which estimate is closer to the truth*; the answer to this question should determine the nature of the policy response of governments and international organizations.

The two ''competing' methods yield radically different results for essentially the same phenomenon—that is, by what percentage has poverty declined and what is the level of poverty today. This paper evaluates the methods in detail and attempts to put the similarities and differences in perspective. It is important to stress that the debate is not about whether there is any or little poverty in the world but its magnitude according to the *conventionally accepted definition* of a-dollar-a-day poverty line (in 1985 prices). The debate is *not* about whether there was *any* poverty reduction during the globalization era or even whether growth is important for poverty reduction. Rather, the debate is about whether the ''observed'' reduction in poverty of only 5 percentage points was *commensurate* with the growth in expenditures and incomes that occurred in the developing world. If the poverty level today is too high (relative to expectations) or the reduction in the past too little (e.g., only 5 percentage points), then the demand by international organizations for more aid and search for a ''new development order'' may be justified. If, on the other hand, the past two decades of high growth have witnessed a rapid reduction of world poverty (13 percentage points between 1987 and 1998 and 31 percentage points between 1980 and 2000), then the correct policy response is to understand what brought about growth and to apply this knowledge to regions with high poverty, such as sub-Saharan Africa.

Interestingly, the two methods (World Bank and *Imagine*) yield almost identical results (in *levels and decline*) for the earlier seven-year period from 1980 to 1987 and

sharply divergent estimates for the subsequent 11-year period, 1987–1998.[1] So what happened in the 11 years that was so different than the previous seven years? Is it choice of data or different definitions that is causing this huge divergence in the two estimates? Obviously not—the same data, definitions, etc. yielded the near identical estimates for the 1980–87 period. The difference is mainly caused by the radical decline in the survey capture ratio, S/NA (where S is the household survey mean of per capita consumption and NA the private final consumption expenditure mean obtained from national accounts), and a decline in the S/NA ratio especially for the poor countries of the world between the two end years, 1987 and 1998. These declines lead to the important result that the *growth* in per capita expenditures, as measured by the World Bank survey-based method, is substantially lower than the conventional estimates of growth via national accounts (*Imagine*). *A determination of which estimate of poverty is correct can only be reached after assessing which estimate of mean growth is correct*. The determination of whether the MDG for 2015 was already reached 15 years earlier in 2000 (and most likely before the goals were formulated in September 2000) is mostly a function of whether one believes the survey-based population-weighted estimate of growth in per capita expenditures[2] (16.7 percent between 1987 and 1998) or the NA-based growth (about twice as high at 29 percent).

The main question for policy is correctly reflected in the title of Ravallion's critique—that is, was "globalization" growth enough to reduce poverty to less than 15 percent in 2000? Differences over methods, data, and assumptions notwithstanding, the "correct" answer to this growth-poverty question can help policymakers decide on the most desirable policies to alleviate poverty in the future—policies derived from the experience in varied countries over the last 20 years. So while I do answer the World Bank's legitimate concerns about data and methods, my major objective remains to establish correctly the relationship between growth and poverty decline—that is, what actually did happen to growth, inequality, and poverty decline between 1987 and 2000?

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[1] Note that a *projection* of the World Bank method, outlined in Chen-Ravallion (2001), backwards from 1987 to 1980, yields the result that there are few differences between *Imagine* and World Bank for the poverty decline, 1980–87.

[2] These growth figures are population-weighted per capita expenditures deflated by country CPIs. This computation is different from per capita expenditure growth reported in table 2, which are based on country per capita expenditures in 1993 consumption PPP terms—that is, each country consumption level is converted into international prices via the PPP consumption exchange rate for 1993.

Data differences and country choices may affect results; consequently, only World Bank data is used throughout the analysis. (See annex I for details.) In addition, the recently made available Penn World Tables, with PPP 1996 as a base and with more countries included than ever before, are used to develop a poverty and growth series for the nonindustrialized world, 1950–2000. (See Bhalla, et al. 2003 where the findings based on these data are discussed in detail.)

The two different methods of measuring poverty, World Bank and *Imagine*, are discussed in detail in this paper. In addition, a third method (essentially one which uses all the World Bank data, definitions, and assumptions, but with the difference that the S/NA ratio, instead of varying randomly, is "fixed" for each country at any year deemed correct, e.g. 1987) is employed to shed light on what the poverty decline would be estimated to be if the S/NA ratio had not varied widely but had stayed relatively constant as it did for most countries until the mid-1980s. Variations around the *Imagine* method (to conform to all assumptions of the World Bank method except the exclusive use of survey means) are also tested. The results are striking—for all methods (except one) and both the 1993 and 1996 PPP series, and the World Bank-specified $1.08 poverty line, poverty in the world was below 15 percent in 2000. (This result also holds for most computations with a higher $1.30 poverty line.) The exception is the World Bank method, which shows a poverty level of 18.2 percent in 2000, a decline of 5.7 percentage points in just two years since 1998. This result bears emphasis—the World Bank method, and data, shows a greater poverty decline in two years than it did in the previous 11 years! This result arises from the only new data added to the 1987–98 World Bank dataset, namely the official household expenditure survey (NSS) for India conducted in 1999–2000.

The second major result pertains to declines in poverty for 1987–98. Most estimates (for both the $1.08 and $1.30 poverty lines and PPP 1993 and PPP 1996 data) are in the 12 to14 percentage point range—again, with the exception of the World Bank method, which shows a decline in the narrow 5.5 to 6.1 percent range.

The third major result pertains to the estimate of the growth in per capita expenditures in the developing world during 1987–98. The published growth (Chen-

Ravallion 2001) is 10.4 percent; our reproduction using only the World Bank data published on the web is 7 percent. This is a large difference and one which occurs despite the same dataset yielding quite comparable and near-identical poverty figures. If the 10.4 percent growth estimate is correct, then *ceteris paribus*, poverty would be lower by an additional 2 percentage points or so—that is, poverty in 2000 was likely close to 16 percent or close to the MDG, even by *exclusively* the World Bank method.

The lack of replicability of World Bank results on mean expenditure growth and therefore poverty raises questions about what actually did happen and therefore about aid and policy advice. The poverty numbers are "news" and determine policies of the World Bank and other international organizations like the IMF, UN, ADB etc. Several documents of each of the quasi-government organizations (including their flagship reports like the *World Development Report, World Economic Outlook, Human Development Report* etc.) look at the World Bank poverty numbers and then proceed with policy design for the developing countries, aid packages, and recommendations for implementation. It is important to set the record straight on whether the MDG of poverty reduction for 2015 was indeed already met in 2000.

The paper is organized in two parts, and an annex contains details on data and definitions. Part I deals exclusively with examination of poverty trends using different methods and different (1993 and 1996) PPP series. Part II deals with questions, issues, and topics raised by the World Bank GEP (2003) and Ravallion. Both parts are in (loose) question and answer format to ease communication about what happened, and how, to growth and poverty in 1987–98 and 1998–2000.

Part I: Data, Definitions, Methods, and Poverty Estimates, 1987–2000

The measurement of poverty is a conceptually straightforward exercise (hence it was dubbed a "Simple Accounting Procedure" or SAP in *Imagine*). If a poverty line is defined, and a distribution is available, then it is a simple matter to count the number of people whose expenditures are below the given poverty line. If it is so simple, then why are there such large differences in the estimates of the World Bank[3] and *Imagine*, why is there so much controversy?

There can be several reasons for divergent estimates. When more than one country is involved, an exchange rate is needed to compare purchasing power in different countries.[4] Differences can also arise due to choice of price deflators—country-specific GDP deflator (for estimates of mean consumption borrowed from national accounts), the local consumer price index (CPI, for survey consumption estimates), or the international price index generated by the Penn World Tables real and nominal PPP series.

Q1: Does choice of exchange rate (consumption vs. income) make any difference to the results on poverty?

The World Bank, via *World Development Indicators* CD-ROM, has distributed the income or "all products" *current* PPP exchange rate for the 1993 PPP series. This series is used by *Imagine*. Since poverty is measured in terms of *consumption*, the World Bank believes that an internally developed PPP consumption exchange rate would be more appropriate. The different exchange rates have an effect on the calculations of the level of world poverty in a given year; if the consumption exchange rate is more expensive (as it appears to be in the case of South Asia) for poor countries, then its use, for any given

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[3] The poverty computations are reported in two academic papers with the same title *How did the world's poorest fare in the 1990s*, unpublished (Chen and Ravallion 2000) and published versions (Chen and Ravallion, 2001). Ordinarily, a working and a published version are not jointly cited. In this case, the unpublished paper has poverty estimates for three intervening years, 1990, 1993 and 1996 (and the same estimates for 1987 and 1998), estimates which, for reasons of space, were not included in the published version.

[4] Towards this goal, the purchasing power project was initiated by the UN authorities some 40 years ago; the latest such estimate is based on computations done for 1996. These data have only recently been released and some results are reported in tables 1 and 2. (See Bhalla, et al. 2003 for a detailed analysis of poverty trends using the 1996 data).

poverty line, will lead to a higher world poverty level than that yielded by the income exchange rate.[5]

The inaccuracy of consumption PPP exchange rates—India and Thailand

The consumption and income "all products" exchange rates for India for 1993 are 7.02 and 6.01 respectively. Given a 70 percent consumption share, this implies that the PPP price of nonconsumption goods in India was 3.65 or that consumption goods were almost twice (7.02 divided by 3.65) as expensive as investment goods. This estimate does not seem credible—food is almost 65 percent of the consumption basket and Indian food prices are close to, or lower than, international prices for food.[6]

The use of a consumption rather than an income exchange rate also explains the sudden spurt in World Bank estimates of poverty in Thailand. In 1985, the consumption and income PPP exchange rates were virtually identical—8.39 (consumption) vs. 8.36 (income). In 1992, the two are again very close—10.12 vs. 10.54, but with the consumption PPP rate somewhat cheaper by 4 percent. In 1993, the implied (extrapolated with data from 1992) consumption exchange rate is 10.31 vs. 10.73. However, the World Bank computed consumption exchange rate jumps to 13.45, or a 30 percent increase in just one year, 1992 to 1993. This is not plausible and suggests that the "new" World Bank estimates for the *level* of poverty in Thailand are also not plausible (also see Bhalla, et al. 2003).

Difference 1: In 1987, an extra approximately 2 percent poor are obtained, by use of consumption vs. income PPP exchange rates; this is primarily due to the exchange rates for consumption being about 20 percent higher for South Asian countries.

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[5] The Penn World Tables (version 5.6) contain a consumption and income price index for each country till 1992. if the reasonable assumption is made that the relative price of consumption does not change between 1992 and 1993 for any individual country, then the 1993 consumption exchange rate can easily be derived from the income PPP exchange rate (see annex I). This appears to be the method followed by the World Bank, except for a few significant outliers--e.g., Thailand.

[6] See Reddy-Pogge (2002) who analyze various attributes of an overall, and poor person's food basket.

Q2: *Is the World Bank contention that "data and definitions" explain the divergent World Bank–*Imagine *poverty estimates correct? No.*

The search for reasons for the large divergence in the World Bank and *Imagine* estimates of world poverty led the World Bank to conclude:

"Three differences between the Bhalla estimates and World Bank's explain Bhalla's different conclusions. These differences include the choice of the poverty line, his use of secondary data sources rather than primary surveys, and consumption adjustments," (*Global Economic Prospects,* 2003, Box 1.5, p.31).

The contribution of each factor towards poverty reduction is examined in detail—and found wanting. However, what GEP and Ravallion fail to mention is that the factor causing the most difference is the considerably lower economic (consumption) growth rate obtained from surveys, compared to the widely used, and believed, consumption growth rate obtained from national accounts data (and used by *Imagine*). Data differences, such as they are, have virtually no impact on poverty estimates. The poverty line chosen by *Imagine* is higher (1.3 vs. 1.08) and the mean consumption level from NA is adjusted *lower* in every country-year by a factor 1.3/1.5 or 0.87. In net terms, the effective poverty line of *Imagine* is about 40 percent higher (1.50 vs. 1.08) and yet a substantially lower level of poverty is observed in 1998—and almost the same poverty levels were observed for 1980–1987.

Primary versus secondary data—makes no difference

In *Imagine*, several sources were employed to build a database of over 900 surveys on the distribution of income or consumption. A method was developed (extension of Kakwani 1980) to proceed from these "secondary" distributions to synthetic primary distributions—that is, to move from expenditure means for quintiles to corresponding means for each percentile.

The World Bank also does not have access to unit record data for some country-year distributions, yet it estimates poverty for such country-years. When unit record data

are not available, the World Bank uses a Lorenz curve approximation. *Imagine* does the same. However, the *Imagine* computations are able to approximate very successfully unit record data at the *percentile* level. Several tests confirm this assertion[7]. *Imagine* presents tests at two extremes of data—tests verified by primary, unit record data for India for several surveys spanning 16 years, 1983–1999, and published selected percentile level data for the United States (*Current Population Survey*) for three decades 1968–1999. When tested against actual mean percentile values for over 250 distributions for rural and urban India, the average error was only 0.4 percent. Several ratios of percentiles (e.g., 90th vs. 50th or 50th vs. 10th) were tested against US published data—the error in these ratios was less than 5 percent, often only 1 or 2 percent.

It can also be the case that distributions *per se* used by the World Bank and *Imagine* are different (in addition to interpolation within a distribution). While often the same, there can be some differences in the data reported by the World Bank on its Web site (75 countries) and those assembled by *Imagine*.

Difference 2: *Not surprisingly, very little variation in poverty estimates are observed due to choice of distributions per se—less than 1 percentage point difference in poverty estimates.*[8]

Q3: *Poverty Line: What is a dollar a day in 1985 prices equal to in 1993 prices?*

Thus, data differences cannot account for differences in poverty estimates. Then what else can? It is possible, as stated by World Bank GEP 2003, that some of the variation may have to do with use of different poverty lines. Both the World Bank and *Imagine* claim that they are using the dollar-a-day 1985 PPP poverty line. For the 1993 PPP base, the World Bank equivalent poverty line is $1.08 a day; the *Imagine* equivalent is for a higher poverty line of $1.30 a day. Both cannot be right.

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[7] The World Bank does not present any tests regarding the accuracy of its Lorenz curve approximations.
[8] The calculations are expected to be similar if the distributions for the two large poor countries—India and China—are near identical in the two datasets, which they are.

What is $1 a day in 1985 PPP prices equal to in 1993 PPP prices? Since different base years are involved (1985 and 1993) this is not an easy question to answer; what can be answered is the *change* in the implicit PPP price level for the two series between 1985 and 1993. This simple computation of price change is mired in some controversy; the World Bank maintains that $1.08 is the equivalent value, thereby maintaining that an international price increase between 1985 and 1993 was only 8 percent.

"Population below $1 a day and $2 a day are the percentages of the population living on less than $1.08 a day and $2.15 at 1993 international prices (*equivalent to $1 and $ 2* in 1985 prices, adjusted for purchasing power parity." (*World Development Indicators 2002*, p. 71, emphasis added).

Imagine provides several arguments to suggest that PPP-based increase in *international prices* 1985–1993 was close to 30 percent. First, and most importantly, the *definitional* increase in world prices was 30 percent; this is obtained via the increase in the numeraire provided by the US GDP deflator (or US CPI). Surprisingly, this simple statistic (US price increase) is "reproduced" erroneously by Ravallion. "Yet adjusting the 1985 $1/day line for US inflation would entail an upward increase of roughly 50 percent." US data suggests that the increase in the GDP deflator was 27.6 percent, and in the US CPI, 34 percent, from 1985 to 1993.

The second piece of evidence is the difference, 30.5 percent, in the *nominal* PPP income estimates for the only overlapping base year, 1985. The nominal 1993 PPP base average per capita income in the world was 30 percent higher than the nominal 1985 PPP base income in 1985.[9] The third piece of evidence is the increase in "international" prices[10] observed for the poorest 8 countries in the world, and the countries which formed the basis of the World Bank's dollar-a-day poverty line, 29.2 percent. (*Imagine*, p. 66)

These three pieces of evidence strongly indicate that the $1 a day poverty line is approximately equal to $1.3 and not $1.08 in 1993 PPP prices. Thus, use of the $1.08 line changes and reduces the purchasing power of the original dollar-a-day line. The old

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[9] Similar calculations for the 1996 PPP data set suggest that the poverty line in 1996 was 6 percent higher than the level observed in 1993, i.e. **the 1996 PPP poverty line is equal to 1.38 (1.3*1.06).** The $ 1.08 line is equal to 1.08*1.06 or $1.15.

[10] The increase in *domestic* price level is composed of two parts—depreciation vis-à-vis the international exchange rate and the increase in the international price level.

dollar a day is now only equal to 82 cents (1.08 divided by 1.3). That the World Bank itself suggests that it has changed the poverty line in real terms (i.e., contradicting its own reports that the two are equivalent), is indicated by the following:

"The $1/day line had been picked by eye-balling the *scatter of points* in the relationship between national poverty lines and national mean consumption. For the revision we used instead the *median* of the lowest 10 poverty lines amongst the 33 countries, which gave the figure of $1.08 at 1993 PPP." (Ravallion, p.4642, emphasis added).

This is the first admission by the World Bank that its international poverty lines of dollar-a-day in 1985 prices and $1.08 a day in 1993 prices are not at all comparable. The World Bank method of "changing the poverty line while keeping it constant" has *no* defense in logic or in economics. The World Bank method will yield different "price increases" between 1985 and 1993 depending on where some of the poor are located. It is like determining per capita income growth by the increase in the average weight or height of individuals. How can *world* inflation possibly be an *outcome* of where the poor are located?[11]

In *Imagine*, I had contended how the dollar a day, 1985 prices, international poverty line was equal to the *Indian* poverty line, with the latter deflated by the *income* PPP exchange rate. In Bhalla, et al. (2003) it is shown how the new World Bank international $1.08 poverty line is actually equal to the Indian poverty line, but this time with deflation by the World Bank supplied *consumption* PPP exchange rate for India![12] This equivalence is easily documented as follows: in current prices, the rural and urban Indian poverty lines (nominal rupees, per capita per month) were Rs. 205.8 and Rs. 281.3, respectively, in 1993–94. With an urbanization ratio of 26.3 percent, this yields a national poverty line of Rs. 225.7 per capita per month. With the PPP consumption exchange rate of 7.03[13] (World Bank Web site and also yielded by Penn World Tables

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[11] Knowledge of where the poor are located may force one to change the poverty line to a lower or higher level. If so, this should be done with reference to the prices the poor face on the goods they buy. In any case, such a changed line will not be equivalent to the earlier poverty line in inflation adjusted terms.

[12] In Bhalla, et al. (2003), it is shown how the Indian poverty line has also been "copied" (without attribution!) by several countries, notwithstanding claims of calorie and national differences etc.

[13] The income PPP exchange rate is Rs. 6.01 or some 16 percent lower--i.e., the equivalent poverty line is 16 percent higher or appro ximately $1.25.

data, 1985 base, for 1992 and extrapolated to 1993), this yields a daily poverty line of $1.055![14]

A *sine qua non* of every analysis on poverty is that the poverty line be kept constant in real terms. Over time currencies change (Indian rupees to US dollars to PPP dollars), poverty continents change (in the 60s it was Asia, today it is Africa), tastes change (poverty line defined in terms of calories or "basic needs" or expenditure or income), prices change, the price base changes (1970 PPP, then called Kravis dollars to 1985 PPP to 1993 PPP dollars) but how to monitor trends does *not* change i.e. the number of the poor are still defined according to the number living below a pre-defined constant poverty line.

Difference 3*: Since* Imagine *has a higher poverty line (by about 20 percent), the choice of poverty line cannot explain the higher* World Bank *and lower* Imagine *poverty estimates*.

Q4: *How much difference to the results are caused by use of NA deflators (for consumption) and local consumer price indices?*

If it is not data, nor definition of poverty lines, what else can be causing the variation in poverty estimates? The two methods have different procedures for estimating mean consumption for any given country-year. When surveys occur, the two methods can yield different estimates (but they do not diverge much for years prior to 1987); when surveys do not occur (as happens for most poor countries for most years) , the method of extrapolation is identical.

World Bank method of obtaining mean consumption

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[14] The consumption and income PPP price levels are reported in the Penn World Tables with reference to the US price levels, and the latter is equal to 100 for each year for income and hovers around 100 for consumption. The exact value for the consumption price level for the United States in 1993 is 102.35. Adjusting the Indian consumption price level in 1993 for this additional 2.35 percent yields 1.0798 or $ 1.08!

The World Bank mean consumption at any point in time is obtained by deflating survey based nominal consumption by the country-specific CPI (1993 base), and then deflating this real 1993 consumption by the country-specific consumption exchange rate for 1993. With this adjustment, a consumption series in 1993 PPP prices is obtained, with gaps for years when no surveys are undertaken. For such years, the previous observed year is taken as the reference year and the growth rate from national accounts used.[15] For example, if there was a survey in 1985, with mean 100, and no survey in 1987, then the survey mean estimated for 1987 is 100 plus the national accounts *growth* in private final expenditure per capita[16].

Imagine method of obtaining mean consumption

The *Imagine* method also starts with local currency nominal units, but these are obtained from national accounts, and deflated by 0.87. This reduction is necessary to account for differences in definition between surveys and national accounts, differences in rate of underestimation of consumption (assumed larger for the rich), and differences in coverage (top 2 percent of the population accounting for 10 percent of total consumption are assumed to be missed by surveys and therefore excluded from calculation of the mean of the "synthetic" surveyed population). It is also the case that 87 percent is close to the average S/NA ratio observed in developing countries in the mid-1980s—so one interpretation of the *Imagine* method is that it assumes the S/NA ratio to be constant for all countries and years and equal to the average 1987 value of 0.87.[17]

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[15] Actually, a "time-based weighting" (but unclear) procedure is used for different survey years (see Chen-Ravallion 2000, 2001). Given that the S/NA ratio has been declining over time, a strict application of the method would lead to an even lower growth rate in mean expenditures, and therefore a lower decline in poverty than the one projected by the World Bank.

[16] If the survey year available is for a forward year, e.g. 1993, then the growth rate backwards to 1987 is used. Note that this method assumes that the survey to national accounts ratio is staying constant at its previously or nearest observed value when surveys are not undertaken. This procedure also applies to years prior to the first survey, and years after the last survey e.g. if estimate is needed for 2000, then the last available mean is taken (e.g. 1993), and the survey mean for 2000 is taken as the 1993 mean multiplied by the increase in per capita NA expenditures, 1993-2000.

[17] An alternative method which assumes that the S/NA ratio is different for different countries but fixed at their individual 1987 (or 1998) levels yields the same percentage point decline in poverty.

The current local currency mean in local currency is then converted into current 1993 PPP by deflating by the *current* 1993 PPP income exchange rate. These current exchange rates change according to relative inflation in the country with respect to international PPP inflation, and this PPP exchange rate also incorporates any appreciation or depreciation of the domestic currency with respect to PPP. (This latter adjustment is not present in the World Bank method which uses a "fixed" 1993 consumption exchange rate). The current international dollar PPP consumption for each country is converted into constant 1993 PPP dollars by deflating by the US GDP deflator with 1993 equal to 100.

What if one needed to project the poverty level backwards to 1950, as done by Bhalla (2002d), and Bourguignon-Morrisson who indeed project backward all the way to 1820? Exactly the same method as projecting forward—there is no conceptual difference; the last available mean (and distribution) is assumed and the growth rate from the national accounts is used to approximate the *survey expenditure* mean.

Since most developing countries do not conduct annual surveys, use of the NA data for deriving growth for the many more *intervening* than *survey* years has two implications: (i) the resulting time-series on mean survey consumption growth will be identical for both the World Bank and *Imagine* series in terms of *growth* when surveys are not undertaken; and (ii) this series will have up and down spikes in the survey year by the World Bank method but not by the *Imagine* method. Thus, both the World Bank and *Imagine* adjust survey means with NA data, the major difference being that *Imagine* does it explicitly, and World Bank does it implicitly.

Annex 1 discusses the methods of computing means and growth rates; the formula for the two growth rates are (with prime signifying log change):

World Bank

$$\mu'_{wb} = (S/NA)' + NA' - CPI' \quad (4)$$

Imagine

$$\mu'_{imagine} = NA' - (PPPXR_y' + PID')\ (5)$$

where S and NA are survey and national account per capita expenditure means, CPI and PID represent the domestic and international deflators, and $PPPXR_y$ is the PPP exchange rate for income.

The above equations suggest that besides growth in S/NA (by definition zero in *Imagine*), differences in growth rate in means can occur due to the different estimates of "inflation"—equal to the difference in the growth in local CPI (World Bank) relative to the sum of exchange rate depreciation and international inflation (*Imagine*).

How much difference? Between 1987 and 1998, with S/NA ratio assumed to be 0.87, the growth rate in mean consumption by the World Bank method is 12.3 percent, that by *Imagine* method, 14.0 percent—that is, use of domestic currency CPI leads to a slightly lower growth of 1.7 percent over 11 years, or 0.15 percent per year.

Difference 4: *In terms of difference in overall poverty reduction, this would add up to less than 1 percent difference in poverty reduction over 12 years— very small compared to the large (6 percentage points) observed in the two methods.*

Q5: *How common is the phenomenon of a declining S/NA ratio? Very.*

Given that data and definitions only affect poverty estimates by a small "measurement error" amount, there is only one possibility left for explaining the poverty variation between World Bank and *Imagine*—the drift in the S/NA ratio, assumed constant by *Imagine* and varying with survey idiosyncrasies, World Bank method.

Until the mid-1980s, the survey and NA income and consumption growth rates observed worldwide were very similar—that is, the S/NA ratio was relatively constant over time for an individual country, albeit significantly different than unity for most countries at any point in time. This parallel movement in the means became particularly haphazard in the last 15 years, with the consequence that survey-based calculations of

growth and poverty have now become hazardous.[18] Survey means are capturing less and less of the national accounts, and this is happening both in the developed economies (e.g., the United States) and developing economies (e.g., India).[19] This has the important consequence that the survey-estimated growth rate, on which poverty calculations are based, are often less than half the NA growth rate—that is, a lot of expenditure growth has gone "missing."

This phenomenon, of increasing "missing expenditures" in the 1990s is near universal. For 63 countries with income surveys, 38 showed a decline in the ratio between the first survey in the 1980s and the last survey in the 1990s, and 25 revealed an increase. For 48 countries with consumption surveys, 36 show a decline and 12 show an increase. Overall, there was a two-thirds chance of a decline in the S/NA ratio. Thus, a decline in the S/NA ratio in the 1990s is in the nature of a stylized fact. In population weighted terms, the mean consumption captured by the surveys is about 10 to 12 percentage points lower in the 1990s than in the mid-1980s.[20]

The difference in the World Bank *and* Imagine *poverty estimates essentially emanate from this undercounting of consumption and overcounting of the poor by the World Bank method*. It is not possible that all of the extra missed 10 to 12 percent of consumption in 1998 accrued to the non-poor, and Bhalla (2002a, 2003) documents how, because of large undercounting of a major item of consumption of the poor—food—that the NA estimates of growth in consumption are closer to the truth than the survey based growth rates derived by the World Bank.[21]

There are very few reasons why the growth rates in mean consumption revealed by the surveys and national accounts should be so different. If the substantially lower growth rate in mean consumption as measured by surveys is accepted as being "accurate"

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[18] It is ironic that just when the exclusive survey method was being "forced" upon the academic and policy community, it should breakdown. Investors and traders will recognize this phenomenon from the stock market!

[19] Triplett (1997) notes that national accounts estimates of per capita expenditures in the United States have grown at about 1 per cent per year faster than survey estimates.

[20] Why this is happening is a major research undertaking; a likely cause is the wider choice of consumption items (which do not make it to the interview list of questions) and the increasing opportunity cost of time (people do not have time for the typical 5 to 6 hour interview—they have other work to do).

[21] In Bhalla (2002a, 2003), it is documented how for one large poor country, India, the growth in survey *incomes* of the poorest (unskilled casual workers in rural areas), equal the growth in national account per capita expenditures and income. For China, the growth in both survey incomes and expenditures is near equal to NA growth estimates.

(as done explicitly by the World Bank method) then there is the implication that there was not enough growth in the developing world in the last twenty years of globalization. Note that it cannot be maintained that the rich (in the developing countries) got richer at the expense of the poor since the difference being talked about is the difference in means, something "rich" expenditures have a lot to contribute to. So the only possibility is that either there was very little growth or that the savings rate in developing countries went through the roof—for either of these scenarios, there is very little anecdotal, or hard, evidence.

Difference 5: *If growth is underestimated by 10 to 12 percent, then poverty is overestimated 5 to 6 percentage points.[22] This is almost exactly the difference observed between the* Imagine *and* World Bank *methods (see Table 1).*

Q6*: Is there a method that is consistent with the official World Bank method of estimating poverty on the basis of surveys (using means and distribution from the same source) but one which does not suffer from the measurement error consequences of the precipitous decline in the S/NA ratio? Yes.*

The World Bank uses exclusively survey means because it feels that surveys yield more "representative" estimates of per capita consumption, and because of a certain "consistency" in using the same source for both the means and the distribution. How the survey mean is estimated for years when surveys are not conducted provides a clue for the principles behind a *third* method, a method consistent with assumptions of World Bank (and *Imagine*)—**this method anchors the mean in the "best" or most representative survey, and uses growth from national accounts**.

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[22] How much poverty reduction results from a given amount of growth is a function of the "shape of distribution" (SDE) elasticity in the initial year i.e. how the poor are concentrated at or near the poverty line. (See *Imagine* for a detailed discussion about SDE and its magnitudes). In 1987, for the non-industrialized world, the SDE was close to 0.5 i.e. each 1 percent of growth in expenditures of the poor (composed of average growth plus change in expenditures due to change in the distribution *at the poverty line*) would lead to a 0.5 percentage point decline in poverty.

The *Imagine* method assumes all country-years to "possess" the same survey capture ratio of 0.87. This assumption can be relaxed and each country's survey-capture ratio fixed at its own unique value prevailing in any selected year. This year can be chosen the same for all countries or different; regardless of the assumption used, the *growth* rate resulting from such exercises will be equal to the NA growth rate. If a country has only one survey year, this method will exactly reflect the World Bank method. Thus, this "new" method incorporates *all* the assumptions and definitions of the World Bank method (survey means, growth rate from national accounts, deflation by local CPI, and PPP consumption exchange rates); the only "correction" it makes is that it uses only *one*—the most "representative" survey year—for each country.

In the final analysis, three separate methods are used to estimate poverty, and its change; the World Bank, *Imagine,* and the above-defined third method. While the first two methods use their own respective deflators and exchange rates, the third method is identical to the World Bank method for all variables except the S/NA ratio, which is kept fixed at the 1987 level.[23]

Table 1 compares the published World Bank results with our reproduction of the same, as well as with the new "improved" World Bank method and the *Imagine* method. These methods are evaluated for poverty and associated parameters for the period 1987–1998. For each method, results are presented for 2 different PPP series—the 1993 PPP base, and the newly made available 1996 PPP base.[24] The reason such varied tests are employed *with the same World Bank dataset* (75 countries, data on the web) is to challenge some myths about the relationship between growth and poverty, and to search for the "true" underlying level of poverty according to a given poverty line.

Q7: *How much did the head count ratio of poverty decline, 1987–1998?*

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[23] Computations are reported for five methods in tables 1 and 2; the first addition is the *Imagine* method, but CPI data and fixed consumption exchange rates (a la the World Bank methodology); the second addition is the World Bank method using the implied NA estimates of consumption implicit in the World Bank survey data. See annex 1.

[24] These data have not heretofore been used for poverty analysis; Bhalla, et al. (2003) presents the first estimates. As documented there, the equivalent poverty line to $1 a day, 1985 prices, is $1.38 a day, 1996 PPP prices.

The first two rows compare the published estimates of poverty decline with our reproduction using the World Bank dataset. The reproduction of the poverty estimates are quite accurate—the published estimate for 1987 is 28.3 percent, we obtain 29.4 percent; for 1998, the respective estimates are 23.5 and 23.9 percent, respectively. The decline in poverty is estimated to be 4.8 percentage points, World Bank published, and 5.5 percentage points, World Bank reproduced.

The *Imagine* method's equivalence of $1 a day in 1985 prices is $1.30; this poverty line yields a level of 27.4 percent in 1987, not much different than the World Bank published estimate. But the decline in poverty is a much larger 13.3 percent. The compromise World Bank–*Imagine* method (also with the higher $1.30 poverty line) reveals a poverty decline of 14.8 percent, almost the same (14.2 percentage point decline) as that yielded by the 1996 PPP data (with an "equivalent" poverty line of $1.38).

Table 1: Poverty in the Nonindustrialized World, 1987–2000

	Head Count Ratio (%) (Poverty line = $1.08)				Head Count Ratio (%) (Poverty line = $1.30)			
	Level			Change	Level			Change
	1987	1998	2000	1987–98	1987	1998	2000	1987–98
Published[1]	**28.3**	**23.5**		**–4.8**				
1993 PPP Base								
World Bank (WB)	**29.4**	**23.9**	**18.2**	**–5.5**	39.2	33.1	27.0	–6.1
Imagine (WB) extended	26.9	13.5	10.8	–13.4	**36.3**	**21.4**	**18.1**	**–14.9**
Imagine extended	21.4	9.1	6.3	–12.3	30.3	15.5	12.0	–14.8
Imagine (WB)	24.4	12.6	10.4	–11.8	33.4	19.0	16.2	–14.4
Imagine	19.1	9.2	6.9	–9.9	**27.4**	**14.1**	**10.9**	**–13.3**
1996 PPP Base								
World Bank (WB)	**24.3**	**18.8**	**13.9**	**–5.5**	33.2	27.1	21.3	–6.1
Imagine (WB) extended	22.0	9.6	7.5	–12.4	**30.5**	**16.3**	**13.2**	**–14.2**
Imagine extended	17.0	7.0	5.1	–10.0	25.3	12.1	9.2	–13.2
Imagine (WB)	19.9	9.5	7.1	–10.4	28.2	14.4	12.0	–13.8
Imagine	14.8	7.4	5.8	–7.4	**22.3**	**11.7**	**9.3**	**–10.6**

Source: *For 1993 PPP data, World Development Indicators, 2002 & World Bank Web site www.worldbank.org ; for 1996 PPP data, www.pwt.econ.upenn.edu*

Notes: *1. Chen-Ravallion(2001)*
2. As documented in Bhalla et. al.(2003a), the equivalent poverty line in 1996 PPP prices is 6% higher than the corresponding level in 1993 PPP prices. The 1996 poverty calculations are estimated with poverty lines equal to $1.15 and $1.38, respectively.
3. For data, and definitions of methods, see Annex I.

Regardless of the base year, the World Bank method always shows the least decline in the head count ratio, 1987–1998; the other declines are often more than twice in magnitude, and most often in the 11 to 13 percent range. The tables also highlight one additional point—poverty levels according to both the modified World Bank survey method (1993 or 1996 base, S/NA fixed at the 1987 level) and *Imagine*, are close to, or lower than 15 percent, in 2000. The new 1996 PPP series shows the following levels of poverty for 1987, 1998, and 2000, (World Bank method), $1.15 poverty line: 24.3, 18.8 and 13.9 percent; the World Bank extended method, 1996 base and $1.38 poverty line, shows a poverty level of 25.3, 12.1 and 9.2 percent in 2000. It does appear, regardless of PPP base, and for all formulations except one, and using the World Bank data and the "official" $1.08 poverty line, that the MDG of poverty reduction for 2015 does seem to have been reached 15 years earlier, and almost at the same time as the goals were being formulated.

The World Bank has not published any estimates for poverty for 2000. However, their method an be applied to their own data and an estimate obtained. All distributions are kept the same as for 1998, but the Indian distribution, and mean, from the NSS household survey for 1999–2000 is added to the dataset. Doing so yields a poverty level of 18.2 percent in 1998, a decline of 5.7 percentage points since 1998. This result bears emphasis—both mean expenditure growth, and poverty decline, are almost the same for the two years, 1998 to 2000, as the growth and poverty reduction observed for the previous 11 years. Since this result might appear incredible (it is not), a detailed accounting is desirable. When surveys are not undertaken, national account growth rates are grafted onto the 1998 level to obtain the mean consumption level for 2000. The nonindustrialized world (excluding India), recovering from the crisis years of 1997–98, grew at a population weighted mean of (log) 3.14 percent in 1999 and 4.67 percent in 2000—a cumulative growth of 7.8 percent. India did conduct a survey and its mean expenditure for the 1999–2000 year, in 1993–94 prices was Rs. 367 per capita per month; in 1993 prices the level was 4 percent lower at Rs. 353 or $50.30 (using World Bank consumption exchange rate of 7.03 for 1993). The World Bank Web site reports a level of PPP $ equal to 45.1 in 1997, and an "implied" level of $46.2 in 1998. Thus, the 1999 per capita expenditure growth rate for India is a large 8.9 percent in 1999. Adding India

to the nonindustrialized world leads to a cumulative growth of 8.3 percent over just two years, and a decline in poverty of 5.7 percentage points—or an amount higher than the decline experienced over the previous 11 years earlier.

Q8*: What happened to inequality, 1987–98*

The reproduction of World Bank data shows a decline in the Gini of 5 percent between 1987–1998 (table 2). The *Imagine* method yields a much larger decline, 11.1 percent; the 1996 PPP data, also using the *Imagine* method, yields a decline of 9.4 percent. These results reflect the same inequality-improving phenomena as first reported in Bhalla (2000b). *Imagine* makes the important point, and not countered by Ravallion (or anyone else), that world inequality *has* to have declined in the last 20 years, and done so because of the significantly above-average growth in two large poor countries of the world, India and China. Together, incomes in these two countries grew at an average rate above 5 percent per annum for 20 years.

Q9: *What happened to consumption growth in the nonindustrialized world, 1987–98*

The developing world where most of the poor reside, grew at more than twice the rate of the industrialized world. Between 1987–1998, population-weighted consumption growth measured in local currencies (deflated by CPI) averaged 2.3 percent per annum (in the nonindustrialized world) in contrast to a 1.5 percent per annum growth in the West. This translates into a cumulative increase of 29 percent over 11 years.

Chen-Ravallion (2000) concur; they state, on the basis of national accounts data (see if quote from recent paper):

"All our measures suggest that the 1990s did not see much progress against consumption poverty…Yet this was a period of aggregate economic growth; the overall rate of growth in real per capita private consumption for the low and middle-income countries over 1990–1997 was 2.6% a year " (2000, p.18).

If PPP adjusted levels are aggregated each year, and the corresponding growth obtained, then per capita expenditures increased by 12.4 percent; and in even more striking contrast, the survey adjusted levels[25] grew by a much lower 7 percentage points (table 2). The "missing" increase in expenditures is almost equal to the survey-based increase in expenditures!

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[25] Adjusted by consumption exchange rates fixed at the level prevailing in 1993; conversion into PPP changes the "weight" structure of the calculation and hence calculations of growth rates.

Table 2: Consumption and Inequality in the Nonindustrialized World, 1987–2000

	Consumption, per capita per day				Gini Index			
	Level			Log growth	Level			Log growth
	1987	1998	2000	1987–98	1987	1998	2000	1987–98
Published[1]				**9.9**				
1993 PPP Base								
World Bank (WB)	**3.00**	**3.21**	**3.40**	**6.8**	53.4	50.8	48.8	−5.0
Imagine (WB) extended	3.31	3.72	3.89	11.7	**55.5**	**49.4**	**48.1**	**−11.6**
Imagine extended	3.66	4.18	4.44	13.3	55.2	48.5	47.1	−12.9
Imagine (WB)	3.63	4.11	4.26	12.4	56.4	51.3	49.7	−9.5
Imagine	4.00	4.61	4.85	14.2	**56.1**	**50.2**	**48.3**	**−11.1**
1996 PPP Base								
World Bank (WB)	**3.80**	**3.92**	**4.13**	**3.1**	55.8	51.3	49.1	−8.4
Imagine (WB) extended	4.17	4.49	4.68	7.4	**57.5**	**49.5**	**48.1**	**−15.0**
Imagine extended	3.97	4.79	5.04	18.8	52.6	47.9	46.4	−9.4
Imagine (WB)	4.47	4.93	5.11	9.8	57.4	51.0	49.3	−11.8
Imagine	4.29	5.29	5.51	21.0	**52.9**	**49.7**	**47.7**	**−6.2**

Notes: *1. Chen – Ravallion (2001)*
2. For data and definitions of methods, see Annex I.

The published 2001 version of the Chen-Ravallion paper contains an estimate (without discussion) of the change in the *survey* means between 1987 and 1998:

 "growth rate in the population-weighted survey mean across our entire data set, namely 0.90 % per capita per year between 1987 and 1998" (2001, p. 297).

This is equivalent to a 10.4 percent (or log 9.9 percent) increase over 11 years. Our reproduction of the World Bank survey data reveals a growth of 7 percent (or log 6.8 percent), a number considerably less than the 10.4 percent estimated by the World Bank.

The World Bank estimate of a 10.4 percent increase in expenditures between 1987 and 1998 *cannot be reproduced*. This is bothersome because the poverty numbers yielded by the reproduction and the published numbers do match. The difference, 7.0 vs. 10.4 percent, is very large for an aggregation of over 5 billion people, and which estimate is right has major implications for any assessment of what happened to poverty decline in the globalization years, 1987–1998. For example, if 10.4 percent is correct, then there is an additional 2 percentage point decline in poverty revealed by the World Bank method but not included in the 4.8 percentage point reported decline; adding this decline to the estimate of 18.2 percent for 2000, suggests that the MDG was almost achieved according to the World Bank method itself.

This nonmatching of mean consumption growth is independent of the fact that for some countries (e.g. Brazil and Cambodia, see below) the World Bank data show levels and/or intertemporal changes in mean consumption (a most important determinant of poverty) to be either too large or too small, given one's knowledge of nonsurvey data.

Part II—Some Special Topics

The big picture notwithstanding, there are several outstanding issues concerning the World Bank poverty analysis and contained in *Imagine*. This second part of the paper addresses such issues. The Q&A or FAQ format is adopted so the interested readers can skip to the sections of greatest interest.

Q10: What quality filters are applied to the survey means which are a central part of the World Bank poverty methodology?

Credibility questions plague the use of survey means. For example, World Bank Web site survey means show mean per capita consumption in Brazil in 1997 to have increased by 27 percent in just one year. Further, the income share of the poorest quintile increased by 40 percent in the same year—from 2.5 to 3.5 percent. These two statistics taken together suggest that the incomes of the poor increased by (log) 60 percent in just one year, having not increased by that amount in 30 previous years taken together! In contrast, the growth rate for mean consumption revealed by Brazil's national accounts (and used by *Imagine*) is a much more credible figure of 3.3 percent.

The World Bank household survey "data quality bloopers" do not end with Brazil. Another wild survey estimate is for Cambodia for 1997. Mean consumption of PPP $6.25 per capita per day makes Cambodia the 14th richest developing country in 1997, richer than Turkey and Russia, and almost equal to Poland. Further, the per capita level of $6.25 per day made the average Cambodian 120 percent richer than the average Chinese. In contrast, according to national accounts estimates, Cambodia was the 33rd poorest country in 1997, more than twice as poor as China and five times poorer than Poland. While NA means may suffer from problems, the errors are nowhere as extreme.

Q11: Are not national accounts data equally suspect?

There are reasons to believe that the national accounts (NA) mean is a *better* approximation to the true unknown mean than a survey mean. Calculations of NA means include data from consumption, production, exports, imports, and intermediate stages of

production; these are all "unified" into a common accounting framework by the national accounts. The NA consumption statistics are generated by aggregating data on several different categories of consumption. The NA estimates are produced on an *annual* basis and undergo several consistency checks. These layers of "quality" checks ensure that *changes* in such estimates are smooth and do not show the spikes revealed by survey data.

Q12. Did the World Bank use the present survey based method to measure poverty prior to 1990? No.

If surveys are not replicating the underlying reality, then can the procedure of exclusively using survey means be justified? Ravallion justifies this usage on the grounds that everybody does it, and everybody always did.

"Bhalla depicts the World Bank's use of surveys to measure poverty as its own idiosyncratic invention around 1990 (see Chapters 7 and 13)…The Bank did not invent this method, and nor *did the Bank only start using it in 1990*…The Bank is hardly alone in this respect. For example, estimates of poverty in the US have been based on surveys for decades, as have those for India … And just about every other country in the world measures poverty this way."(p. 4640, emphasis added).

The facts are otherwise and are as follows. The procedure used in *Imagine* is almost identical to that used in the first paper on world poverty by the World Bank (Ahluwalia, Carter, and Chenery 1979)—that is, distributions from surveys and national account means to derive world poverty estimates. This procedure was also used in Latin America (Altimir 1981) and India. Indeed, both Bhalla and Deaton point out that the Indian government did not give any good reasons to reject the traditional practice, which they did, as per the World Bank's suggestion, in the mid-1990s.

"Indeed, this is how the official poverty counts used to be done in India, and no very convincing reason was ever given for the change following the recommendations in Government of India [1993]," Deaton (2001, p.135).

Ravallion is right (quote above) about the United States using survey means—but it is the only country in the world which conducts an *annual* survey. The statistical methods and practices found in the United States are likely to be somewhat superior to those found in the developing countries. Even in the United States an increase in survey under-capture has become a serious problem since the mid-1980s—that is, precisely when the World Bank started advocating the survey method to developing countries, the practice started failing at the frontiers.

Q13: *Is there "mixed" evidence regarding inequality change, 1987–1998?*

World Bank data and methods yield the result that inequality improved sharply for the nonindustrialized world, 1987–98. However, Ravallion contends that there is only "mixed evidence" regarding inequality change. Among all the studies cited by Ravallion the only study showing an increase in inequality is that by Milanovic (1999). This study was thoroughly discussed in *Imagine a*nd discredited because of severe data problems— Milanovic substitutes survey consumption means for survey income means when there is no income survey in the country. Milanovic's much advertised worldwide distributions show a large 5 percent increase in inequality in just five years, 1988 to 1993; in these computations, India's *consumption* survey mean represents income, in much the same way as US survey income represents income. This peculiar kind of mixing of data yields predictably unreliable results—e.g., Korea is shown to be a richer country than England, or Sweden in 1993. Or that Ethiopia in the same year was 40 percent richer than India.[26]

Bhalla (2000b) and *Imagine* were the first studies to assert that because of what was happening in China and India, world inequality had to have improved. Heuristically, the incontrovertibility of the inequality-improving result can be documented as follows. Assume the 600 million in the rich West all are in the top 10 percent; the 2.3 billion Chinese and Indians constitute the bottom 40 percent. Over 20 years, the bottom 40 percent increased its income five-fold while the top 10 percent increased its income by less than 50 percent. Given these data, *there isn't a method that can show inequality has increased.* "Bad" data, however, can yield the counterintuitive result—e.g., that

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[26] Milanovic's computations are further confounded by the fact that different countries have very different S/NA ratios.

inequality increased by a large 5 percent between 1988 and 1993 (Milanovic), that per capita consumption in Nepal in 1995 was 30 percent higher than India (Milanovic), or that Cambodia was twice as rich as China in 1997 (Chen-Ravallion World Bank Web data).

The overwhelming unambiguous conclusion is that inequality improved (and had to have improved) with globalization. But there is one study that reveals uncertainty about the final result—the Chen-Ravallion (2000, 2001) papers show *both* that inequality worsened significantly and improved significantly between 1987 and 1998.

Chen-Ravallion (2000) authoritatively state that inequality increased; a year later, in *same* paper with the *same* title, most importantly with the *same* poverty numbers, the authors authoritatively state the opposite: inequality decreased. In "interpretation 1," Chen-Ravallion state that the observed poverty decline during 1987–1998 was too little because of a worsening in inequality. In "interpretation 2," Chen-Ravallion state that the reason poverty did not decline by much was because growth was too little—and that an improvement in inequality allowed poverty to decline somewhat. These contradictory conclusions are documented below:

Chen-Ravallion on trends in inequality, 1987–1998, version 1:

The lack of any significant decline in world poverty despite record growth suggests that something was drastically wrong with the policies pursued over the last twenty years. What went wrong? Rising inequality was one factor. …There is now evidence of quite sharply rising inter-personal income inequality in the world during this period; Milanovic (1999) estimates that the world Gini index increased by 5% between 1988 and 1993 (from 0.63 to 0.66). This could easily wipe out the gains to the world's poor from global economic growth." Chen-Ravallion (2000,p.18).

Chen-Ravallion on trends in inequality, 1987–1998, version 2:

"There is a seemingly widespread view that rising income inequality between and within countries in the 1990s has been stifling the prospects for poverty reduction through economic growth.…these results do not support the view that rising inter-personal inequality in the developing world (either within or between countries) has been putting a brake on the aggregate rate of poverty reduction. In short, the proximate cause of slow progress in reducing poverty in the aggregate was not worsening distribution but too little growth" (p. 16–17, Chen-Ravallion 2001)

Q14: *Which conclusion does the data support: Convergence* (Imagine) *or divergence (World Bank)?*

Computations of estimates of world *individual* inequality are involved exercises. One favorite short-cut method of deriving results on convergence (less inequality) is to calculate the relative income of a rich country (e.g., the United States) with that of the poorest country. The results of this (questionable) method were published by Pritchett (1997) and the phenomenon described as "Big-Time divergence." *Imagine* documented several improvements to this short-cut (e.g., top 20 percent of the world population vs. bottom 20 percent, top 20 vs. bottom 20 countries, keeping both sets of countries the same as of some base-period, 1960 or 1980). All the tests showed convergence since 1980—that is, world inequality became less with globalization.

Ravallion is quite confident that China is causing the divergence myth to be rejected in *Imagine.*

"China is the 19th poorest country in the Penn World Tables in 1960, and clearly this country must figure prominently in *Imagine*'s (population-weighted) calculations. One cannot claim that 'divergence is a myth' based solely on China! It would be of interest to see if Bhalla's conclusion is robust to using the poorest 18 countries instead" (p. 4639).

This suggestion is taken seriously and relevant computations reported in table 3— all calculations omit China. In addition, a *range* of top and bottom countries are tested— e.g., top and bottom 15, 18, 20, and 25. In addition, results are presented not just for two end-points (1960 and 1995) as in the World Bank document, *World Development Report* 2000/01 *Attacking Poverty*, but for three years, 1960, 1980, and 2000.

The results suggest that there was *divergence* between 1960 and 1980 and *convergence* between 1980 and 2000. Except for the set of bottom and top 15 countries benchmarked to1960 and the set of bottom and top 25 countries benchmarked to1980, all the other results suggest an increase in the ratio of incomes from 1960 to 1980 (divergence), and a decline in the same, 1980 to 2000 (convergence). In addition, the table illustrates a conceptual error in the approach taken by the World Bank when it

compared the top 20 with the bottom 20 countries (*World Development Report* 2000/01). There is huge variance in the population contained in the various classifications. These varying populations highlight the absurdity of using a constant set of comparator countries for a test of convergence. For example, the bottom 15 countries had a population of only 24 million in 1960; the top 15 had a population of 366 million.

Table 3: Ratio of Top/Bottom ranked countries mean income: 1960, 1980, and 2000

	1960	1980	2000
Constant Set of Countries Benchmarked to 1960			
15 countries	23.7	22.4	24.6
16 countries	20.4	18.3	17.0
20 countries	19.1	18.2	17.2
25 countries	17.3	17.7	15.9
Constant Set of Countries Benchmarked to 1980			
15 countries	20.0	30.7	26.1
16 countries	19.6	30.1	25.7
20 countries	14.8	25.3	22.7
25 countries	15.0	22.7	23.9
Population (in million)			
Top ranked 15 countries	366.0	433.1	603.1
Bottom ranked 15 countries	23.7	30.7	42.2
Top ranked 20 countries	431.6	629.5	793.5
Bottom ranked 20 countries	288.9	321.7	442.8
Top ranked 25 countries	508.6	700.4	821.8
Bottom ranked 25 countries	340.6	433.2	513.8

Notes:

1. China has been excluded from all calculations of the bottom set of countries.
2. All levels are in 1993 PPP $1 per day, countries weighted by population.

Q15: *The (un)-importance of initial distribution*:

Since the *World Development Report* of 1990, several documents have testified to this presumed importance of initial inequality in reducing future poverty.

World Development Report 1990 (p.47): "A 10 percent increase in the incomes of the poor in Bangladesh and India would reduce the incidence of poverty by about 7 percentage points. *Where the distribution of income is more unequal*, as in Venezuela and Brazil, the corresponding figure would be only 3 percentage points" (emphasis added).

World Development Report 2000/01 (p.55): "If poor people get a small share of existing income and if inequality is unchanged, they will also get a small share of the new income generated by growth, muting the effects of growth on poverty."

Ravallion (2001, p. 15): "Even if inequality is not rising, a high initial level of inequality can stifle prospects for pro-poor growth."

Klasen (2001, p.3) "A given rate of pro-poor growth will lead to different rates of poverty reduction, *depending on the level of initial inequality,*" (emphasis added).

Is the conventional wisdom wrong? Yes. Because what matters for poverty change is not overall inequality but inequality *at the poverty line*. Even unequal societies such as Brazil can have "zones" where equality is not so unequal. For example, the bottom 20 percent may have only 5 percent of total income, but all these 20 percent could have the same income; and when such incomes are close to the poverty line, the clustering will cause the poverty reducing potency of growth (the elasticity) to be very large.

There is also little empirical support for the notion that initial overall inequality has, *ceteris paribus*, a negative effect on poverty reduction. For example, in Brazil in the late 1960s, 10 percent growth led to a poverty decline (in percentage points) of 3.1 percent; in the nineties, if the same growth had occurred, and with no change in inequality, the poverty decline would have been only 2.2 percentage points. In India, in the early 1980s, each 10 percent growth led to 8 percentage points decline in poverty; in the late 1990s, the expected decline, *ceteris paribus*, was also 8 percentage points.

With a Gini of 27.8, China was a very equal economy in the early 1980s. At that time, each 10 percent increase in incomes led to a 5.9 percent decline in the head count ratio (HCR). A decade later, income distribution in China became more unequal; but the same amount of growth now led to a larger decline in the HCR, 7.6 percent, (because the distribution *around the poverty line* was now more equal).

In other words, the *same* amount of economic growth, in the *same* country, for the *same* poverty line, for the *same* initial inequality, and for the same "quality" of growth, can lead to similar or different poverty declines.

Q16: The World Bank contends that the survey to national accounts ratio in India has not witnessed a trend decline. Is this correct? No.

India is a large poor country, and one where the survey capture, or S/NA, ratio has been consistently declining since the 1960s. This was documented in *Imagine*, but Ravallion believes that this *trend decline* is largely due to "national account adjustments:"

"The appearance of sizable divergence between the National Sample Survey (NSS) and NAS consumption aggregates for India in the 1990s is deceptive unless one takes account of the changes in methods used by the NAS… Sen (2001) finds little sign of a decrease in the ratio of NSS consumption to NAS consumption during the 1990s".(Ravallion 2002, p.4642)

Table 4 contains the facts. The NSS means are reported as well as the estimate of mean consumption, and S/NA ratio, according to *three* different NAS series (1970–71 base, 1980–81 base, and 1993–94 base). All different "base" series are reported to emphasize that the choice of the base year does not make *any* difference to the conclusion. The table also highlights the year for which the base year was "operational"—e.g., 1973 and 1977 belongs to the 1970 base series, 1983 and 1987 to the 1980 base series, and 1993 and 1999 to the 1993 base series. There is *no* basis for the conclusion[27] that there was no or small decrease in the ratio in the 1990s: in 1987, the ratio was 66.7 and already by 1993 it

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[27] Sen's conclusion is also accepted, without caveats, by Sundaram-Tendulkar (2002): "Sen(2000) has shown clearly that 'there is no evidence of any large widening of the gap between NAS and NSS estimates of nominal consumption in the 90s (p. 4509)", p.1.

had declined by almost 10 percent; in 1998,[28] the ratio plummeted by more than 30 percent; in 1999, the ratio was still 18 percent lower relative to 1987.

Q17 Given that survey means have increasingly become unreliable, are there methods to adjust survey means to national account means? Yes—Imagine *and the method offered in Part I.*

If survey means are adjusted to national accounts, problems of noncoverage of some rich, and underreporting of the included rich, have to be accounted for. *Imagine* does that but Ravallion is not convinced:

"*Fortunately*, a careful study by Sundaram and Tendulkar (2001) did similar calculations to Bhalla's on the same data set and found that for categories of consumption accounting for over 75% of the consumption of the poor (bottom 30% of the population in terms of consumption per person) the divergence between the NAS and NSS estimates was relatively small, and negative in some cases." (Ravallion, p. 4642, emphasis added)

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[28] The World Bank does not report the 1998 national survey for India on its Web site; perhaps the fact that for this year, the ratio of S/NA was a low 48 percent led to its exclusion. This particular survey was reported by the government of India and active discussions were held over its finding that poverty had increased in India since the introduction of economic reforms in 1991-1992.

	1973	1977	1983	1987	1993	1997	1998	1999
1. Mean Survey Consumption - Rural (Rs.)	53.0	68.9	112.5	158.1	281.4	395.0	382.1	486.2
2. Mean Survey Consumption - Urban (Rs.)	70.8	96.2	164.0	250.6	458.0	645.4	684.3	855.0
3. Urbanization Ratio (%)	20.7	22.0	23.8	24.8	26.3	27.4	27.8	28.1
4. Mean Consumption, Survey (Rs.)	56.7	74.9	124.8	181.0	327.8	463.6	466.1	589.8
5. Mean Consumption, NA '93 base (Rs.)	79.7	108.0	198.0	271.5	533.3	844.1	970.7	1057.2
6. Mean Consumption, NA '81 base (Rs.)	66.3	89.8	166.8	233.8	411.2	582.0		
7. Mean Consumption, NA '70 base (Rs.)	61.1	82.0	153.9					
S/NA Ratio, '93 base (4/5)	71.1	69.4	63.0	66.7	**61.5**	**54.9**	**48.0**	**55.8**
S/NA Ratio, '81 base (4/6)	85.5	83.4	**74.8**	**77.4**	79.7	79.7		
S/NA Ratio, '70 base (4/7)	**92.8**	**91.4**	81.1					

Source: Unit record data, NSS surveys, 1983–1999; for 1973 & 1977, see ADB(2002); urbanization ratio and NA consumption, RBI Handbook of Statistics, various issues.
Notes: 1) All levels are in current prices, per capita per month.
2) S/NA ratio is the ratio (*100) of the survey mean to the respective NA mean; the latter is given by the mean of private final consumption expenditures.

Sundaram-Tendulkar do the aggregation for broad groups of commodities and broad groups of households (bottom 30, top 10 percent) while *Imagine* aggregates according to 39 different commodities and *each* percentile of households. *Imagine's* method is a logical extension of the Sundaram-Tendulkar exercise; the only difference is that *Imagine* does for each commodity and each percentile what Sundaram-Tendulkar do for broad groups of commodities and groups of percentiles. Surely, by doing an exercise in greater detail, I am neither inventing a new method, nor obtaining a larger error.

When the Sundaram-Tendulkar exercise is done properly, the *Imagine* result is obtained. An item by item comparison indicates that the average consumption of the bottom 40 percent should be multiplied by 1.35 to "match" the national accounts mean; for the entire population the multiplier is 1.41. In other words, if the survey mean is a 100, the adjusted survey mean is 141. Equivalently, if the NA mean is 100, the survey mean is (100/1.41) or 70.9.

Ravallion worries about the impact on poverty of using a constant multiplier:

"[Bhalla] asserts that the decile specific adjustment factors is not so large as to lead one to question his assumption of a constant (distribution-neutral) adjustment. This is entirely unclear, however, since no calculations are given of the impact on measured poverty" (p.4642).

But it is obviously the case that the constant multiplier method is biased in favor of showing higher, not lower, poverty. *Imagine* does not take 100 as the "appropriate" NA mean; instead, it uses this mean deflated by (1.3/1.5)—so all expenditures get adjusted downward.[29] As stated in *Imagine*, and earlier, the scaling down of the NA mean by almost 15 percent is a very large adjustment, and one that is biased in favor of finding more poverty than actually exists.

But are these multiplier results plausible? Is it reasonable to expect that most of the missing consumption is accounted for by the rich. Indeed it is. The adjustments preserve the original distribution for each *item*. Since the top 20 percent of the population in India accounts for about 45 percent of total consumption expenditures, they should also account for 45 percent of the *missing* expenditures, a point missed by Sundaram-Tendulkar and Ravallion. Further, the large underestimation of food items should be noted, which is about 42 percent, compared to 68 percent for non-food items. Food items have a low income elasticity—and there is a physical limit to how much extra food the rich can consume. So the "benefits" of underestimation of food items accrue "disproportionately" to the poor, as do benefits of underestimation of non-food items accrue "disproportionately" to the rich.

Q18: The Millennium Development Poverty Reduction goal has been reached. Why should one believe this result?

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[29] It is obvious that decile specific multipliers (given that they increase systematically with mean consumption) will lead to a worse distribution than the given survey distribution. But the adjustment downward of the NA mean implies that a constant multiplier will lead to upwardly biased poverty estimates.

This paper answers the major questions raised by Ravallion and World Bank, GEP (2003). Their "objections" were centered on the fact that the data used in *Imagine* was not *identical* (most of it was the same) to that used by the World Bank. This objection is not applicable anymore since only World Bank supplied data has been used in the analysis.

Part I of this paper demonstrated that regardless of the data used, or definitions, or inclusion or exclusion of China from the analysis, inequality in the nonindustrialized world did decline by at least 5 percent, and perhaps as much as 15 percent, between 1987 and 1998. Thus, growth was pro-poor, and in a historical context, quite unusually pro-poor during this globalization period. (Inequality had worsened between 1820 and 1980 according to Bourguignon-Morrisson). Given this unusual combination of high growth and inequality improvement, poverty also declined by historic proportions—by most measures, by about 12 to13 percentage points. Thus, given an initial 28 to 29 percent level of poverty, the MDG of 15 percent poor was reached in 2000, if not earlier in 1998. There are no "assumptions" that drive this result—it is the logical culmination of high growth and inequality improvement.

Regardless of the differences in data and methods, the fact remains that both the World Bank and *Imagine* report very similar levels of world poverty in 1987, with the *Imagine* estimate being somewhat higher. Where the two methods differ, and differ radically, is in the estimation of the decline in poverty subsequent to 1987 (till 1998): 4.8 percentage points (WB) and a magnitude almost three times larger (12 percentage points) in *Imagine*.

There are several reasons why the two methods offer such different results, but the core reason has to both explain the close match in 1987 and the huge divergence by 1998.

The core explanation is rather straightforward: the ratio of average consumption measured via surveys to that measured via the national accounts (referred to as S/NA) has been declining, and declining more in poor countries.[30] This decline is *the* "smoking gun"; not adjusting for it leads to the wrong conclusion that poverty reduction has not matched pace with expenditure or income growth over the last two decades. This

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[30] A reasonable hypothesis is that this decline is a function of increasing inequality. However, for India, 1983–1999, no inequality change is observed and yet the survey to national accounts ratio shows a large decline.

statistical artifact is primarily responsible for wrong theories, and wrong interpretations about growth and poverty reduction.

If the wrong combination of survey poverty and NA growth is jointly believed, then inequality in the nonindustrialized world has to have worsened, and worsened considerably. If the smaller survey based increase in mean expenditures is accurate, there should be very good reasons for believing that despite the precipitous fall in the S/NA ratio, the surveys are accurately reflecting the average consumption in the population. If the smaller decline in poverty is believed, it must mean that something seriously has gone wrong with the national account estimates of consumption in most of the world in the nineties. If the smaller decline in poverty is believed, growth must have not been of good "quality", and hence search should be on for policies that deliver better growth. If the 5 percentage point poverty reduction is accurate, then poverty decline was too little, the growth was not "pro-poor" and not pro-poor because it was of the wrong kind—capital intensive, multinational intensive, not in agriculture where the poor reside, etc.

What if the smaller decline is in error, and the larger decline in poverty is considerably more accurate? In *Imagine*, several "smell tests" (if it smells like a rose it cannot be garbage"), or "duck tests" ("if it runs like a BMW it cannot be a duck") are offered to help assess whether the World Bank methods and estimates of poverty are right, or whether the *Imagine* estimates are right. Data differences can cause a difference in the results. But virtually the entire difference in the level of poverty in 1987[31] is caused by differences in the PPP exchange rate—and this only for the South Asia region (and Thailand).[32] Virtually the entire difference in the trend decline in poverty since 1987 is caused by the non-constancy, and the trend decline in the S/NA ratio, 1987–1998. No sophisticated tests or evaluations are needed to know which estimate of poverty decline is closer to the truth—all that is needed is an evaluation of whether surveys are consistent in capturing relatively the same fraction of *average* expenditures in 1998 as they did in 1987.

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[31] The country composition is also different—*Imagine* includes countries like Afghanistan, Burma, and Iraq in its calculations of poverty, the World Bank method does not, since survey information for such countries is not available.

[32] *Imagine* also documents that the World Bank method has *lowered* the poverty line by about 20 percent—that is, a dollar a day in 1985 equals $1.30 in 1993, but the World bank method assumes that the equivalence is obtained with only 8 percent world inflation at $1.08.

Annex I: Data and Definitions

This paper uses *exclusively* the data on household surveys provided by the World Bank on its Web site, www.worldbank.org/povmonitor.[33] The Web site contains distribution and means data for 75 countries, and some 220 odd household surveys spanning the years 1980–1998[34]. The data from this Web site form the primary source for computations of poverty (by the World Bank).

Penn World Tables 5.6 (1985 base) and the 1996 base, version 6, are available from the Web site www.pwt.econ.upenn.edu.

Construction of consumption means for different methods

There are five methods for which means are computed (as reported in tables 1 and 2).

The method of computation of these means is as follows:

World Bank: $$m_{WB} = \left(\frac{S}{NA_C} \right) * \left(\frac{NA_C}{CPI} \right) * \left(\frac{1}{PPPXR_{93,C}} \right) \qquad (1)$$

Where S/NA_c is the survey to national accounts ratio, NA_C is the national accounts estimate of consumption, CPI is the consumer price index deflator, and $PPPXR_{93,C}$ is the PPP consumption exchange rate in 1993 (posted on the World Bank Web site).

The World Bank survey mean (in 1993 PPP $) is posted on the Web site and therefore the *implied* survey to national accounts ratio (S/NA_c) can be easily derived from the above equation.

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[33] "Drawing on the set of suitable household surveys currently available, this web site provides access to poverty and inequality measures made by staff of the World Bank's Research Group…the methods used are summarized in the paper, "*How did the world's poorest fare in the 1990s*" (www.worldbank.org/povmonitor page entitled Global Poverty Monitoring).

[34] The Chen-Ravallion poverty papers cover a slightly larger population than the web data set, and a few more countries—e.g., South Korea. For some important large population poor countries, e.g. Nigeria and Vietnam, *no* data on the web is posted by the Bank. If a bias is present, it is that the mean consumption of the excluded countries is higher, and growth rate lower, than those countries for which data are posted. But the bias is not large—thus, the web data are a suitable vehicle to test the World Bank results.

$$\textit{Imagine}: \ \mathbf{m}_{\text{Imag}} = \left(\frac{S}{NA} = 0.87 \right) * \left(\frac{NA_C}{PPPXR_{Current}} \right) * \left(\frac{1}{PD} \right) (2)$$

Where S/NA_c is assumed to be held constant at 0.87, $PPPXR_{Current}$ is the *current* PPP exchange rate (obtained from World Bank, *World Development Indicators* CD Rom), and *PD* is the current international (US) price deflator.

The *Imagine* (World Bank) method uses the World Bank survey means and multiplies them by the inverse of the "implicit" S/NA ratio, (S/NA$_c$) derived above; this yields an "implicit" NA series (defined according to the World Bank method—country specific CPI and PPP consumption exchange rates) which is then deflated by 0.87 to arrive at a NA adjusted survey mean for use in poverty calculations.

The *Imagine* (World Bank) *extended* method fixes the (S/NA$_c$) ratio obtained for 1987; if a survey was not conducted in 1987, then the ratio obtained for the latest survey year *prior* to 1987, or the year of the first survey year, whichever was earlier, is used. This ratio, specific to each country, is kept constant for that country for all the years. If this ratio is multiplied with the *Imagine* mean defined above, one obtains the means according to the *Imagine extended* method.

References

Ahluwalia, Montek S., N. Carter, and H. Chenery. 1979. Growth and Poverty in Developing Countries. *Journal of Development Economics* 6, 399–341.

Altimir, Oscar. 1981. Poverty in Latin American Countries: A Review of Concepts and Data. *CEPAL Review* no. 13 (April).

Atkinson, A.B. 1999. *Is Rising Income Inequality Inevitable? A Critique of the Transatlantic Consensus*. World Institute for Development Economics Research publication. Tokyo: United Nations University.

Atkinson, A.B., and A. Brandolini. 1999. *Promise and Pitfalls in the Use of Secondary Data Sets: Income Inequality in OECD Countries*. Nuffield College & Banca d'Italia Research Department, Oxford and Rome. Photocopy (July).

Bhalla, Surjit S. 2000a. Growth and Poverty in India—Myth and Reality. In *Development, Poverty and Fiscal Policy: Decentralization of Institutions*, ed. Govinda Rao. Oxford: Oxford University Press, October.

Bhalla, Surjit S. 2000b. *Trends in World Poverty: Research and Ideology.* Paper presented at the International Monetary Fund, Washington (June 28).

Bhalla, Surjit S. 2002a. *Recounting the Poor*. Paper presented at a World Bank workshop on Poverty Monitoring and Evaluation, New Delhi, January 11; also published in the *Economic and Political Weekly*, January 25-31, 2003, p. 338–350.

Bhalla, Surjit S. 2002b. *Unintended Consequences of Monopoly Funding of Research.* Photocopy (May).

Bhalla, Surjit S. 2002c. *Imagine there's no country: Poverty, Inequality and Growth in the Era of Globalization*, Institute of International Economics, September (first draft, 2001).

Bhalla, Surjit S. 2002d. *Trade, Growth and Poverty: Re-examining the Linkages*, presented at the Fourth Asia Development Forum, Seoul, Korea, November 3-5.

Bhalla, Surjit S. 2002e. *Poor Results and Poorer Policy: A Comparative Analysis of Estimates of Global Inequality and Poverty*, presented at the CESIfo conference on Globalisation, Inequality and Well-Being. Munich, November 8-9.

Bhalla, Surjit S. 2003. Not as Poor, nor as Unequal, as you think: India, 1950–2000. Report on research project entitled *The Myth and Reality of Poverty in India*, Planning Commission, Government of India, May.

Bhalla, Surjit S. and Associates. 2003. *End of Asian Poverty?* Report prepared for research project RETA-5917 by a team led by Surjit S. Bhalla. Asian Development Bank, Manila, May.

Bourguignon, François, and Christian Morrisson. 2001. *Inequality among World Citizens: 1820–1992*. World Bank, Washington. Photocopy (February). First draft, June 1999.

Chen, Shaohua, and Martin Ravallion. 2001. *How Did the World's Poorest Fare in the 1990s?* Development Research Group, World Bank, Washington. Photocopy.

Chen, Shaohua, and Martin Ravallion. 2000. How Did the World's Poorest Fare in the 1990s? *Review of Income and Wealth* 47: 283–300.

Deaton, Angus. 2001. *Counting the World's Poor: Problems and Possible Solutions.* Princeton University, Princeton, NJ. Photocopy (August).

Deininger, Klaus, and Lyn Squire. 1996. *A New Data Set Measuring Income Inequality. World Bank Economic Review* 10, no. 3 (September): 565–592.

Government of India. 1993. *Report of The Expert Group on Estimation of Proportion and Number of Poor*. New Delhi: Planning Division, Planning Commission, Government of India.

Kakwani, Nanak. 1980. *Income Inequality and Poverty: Methods of Estimation and Policy Applications.* Oxford: Oxford University Press.

Klasen, Stephan. 2001. *In Search of The Holy Grail: How to Achieve Pro-Poor Growth?* Photocopy (July 1, 2001).

Milanovic, Branko. 2002. *The Ricardian Vice: Why Sala-I-Martin's calculations of world income inequality cannot be right.* Washington: World Bank, Photocopy (September).

Milanovic, Branko. 1999. *True World Income Distribution, 1988 and 1993: First calculations Based on Household Survey Alone*. Washington: Development Research Group, World Bank, Washington. Photocopy (October).

Pritchett, Lant. 1997. Divergence, Big Time. *Journal of Economic Perspectives* 11 (3): 3–17.

Pritchett, Lant. 2001. *Divergence, Big Time.* Washington: World Bank. Photocopy (7 July).

Ravallion, Martin. 2002. Have we already met the Millennium Development Goals for Poverty? Surjit Bhalla's Imagine There's No Country. *Economic and Political Weekly*, November 16-22.

Ravallion, Martin, and Chen, Shaohua. 1996. *What Can New Survey Data Tell Us about Recent Changes in Distribution and Poverty*? World Bank Policy Research working paper 1694, December.

Ravallion, Martin, Gaurav Datt, and Dominique van de Walle. 1991. Quantifying Absolute Poverty in the Developing World. *Review of Income and Wealth* 37, no. 4 (December): 345–361.

Reddy, G. Sanjay, and Thomas W. Pogge. 2002. *How Not to Count The Poor.* www.socialanalysis.org.

Sala-i-Martin, Xavier. 2002a. *The Disturbing Rise of Global Income Inequality.* NBER Working Paper 8904. Cambridge, MA: National Bureau of Economic Research.

Sala-i-Martin, Xavier. 2002b. *The World Distribution of Income.* NBER Working Paper 8933. Cambridge, MA: National Bureau of Economic Research.

Sala-i-Martin, Xavier. 2002c. *The Sectarian Vice: A Letter to Branko Milanovic in Response to his Criticism of Sala-I-Martin*.

Sen, Abhijit. 2001. Estimates of Consumer Expenditure and its Distribution: Statistical Priorities after the NSS 55th Round. *Economics and Political Weekly* 35 (December 16): 4499–4518.

Sundaram, K. 2001. *Employment and Poverty in India in the Nineteen Nineties: Further Results from NSS 55th Round Employment-Unemployment Survey*, 1999–2000. Delhi School of Economics, University of Delhi, Delhi. Photocopy (May).

Sundaram, K., and Suresh D. Tendulkar. 2001. NAS-NSS Estimates of Private Consumption for Poverty Estimation: A Disaggregated Comparison for 1993–94. *Economics and Political Weekly* (January 13): 119–129.

Thomas, Vinod. 2000. *The Quality of Growth.* New York: Oxford University Press.

Triplett, Jack E. 1997. *Measuring Consumption: The Post-1973 Slowdown and the Research Issues.* Federal Bank Review (Federal Reserve Bank of Saint Louis), May/June: 9–42.

United Nations. 2002. *Human Development Report, 2002: Deepening Democracy in an Integrated World*. New York.

World Bank. 1990. *World Development Report 1990: Poverty.* New York: Oxford University Press.

World Bank. 2001. *World Development Report 2000/2001: Attacking Poverty.* New York: Oxford University Press.

World Bank. 2002. World Development Indicators. Washington: World Bank.

World Bank. 2003. *Global Economic Prospects: Investing to Unlock Global Opportunities.* Washington: World Bank.

Yotopoulos, Pan. 1989. Distribution of Real Income: Within Countries and by the World Income Classes. *Review of Income and Wealth* 35, no 4: 357–76.