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## Surveys and National Accounts: Can a Choice Be Made?

When the first international poverty line was developed by Ahluwalia, Carter, and Chenery (1979), the method used by scholars and international agencies was to adjust the “noisy” survey mean to the considerably less noisy national accounts mean. With the advent of the second international line, the method also changed. Henceforth, no adjustments were made to survey means, at least none that were “official.” As we have seen in the previous chapters, some adjustments have been made to survey data anyway. Which raises the obvious question: Is there a method that will use survey data and will adjust it to national accounts in a transparent and objective manner? Toward the end of this chapter, such a method is offered.

Given that a distribution of incomes is available, one question remains: What is the mean level of income in a country in any given year? There are two choices—either use the survey mean as the estimate, or use a national accounts (NA) mean. The natural tendency is to use the NA estimate, not least because such estimates are available every year, unlike the survey estimates, which appear on the scene every once in a while. Long before household surveys, there were statistical authorities in every country churning out “national accounts” estimates. We take it for granted, but generating data on industrial production, agricultural growth, average computer prices, software exports, and so on is part of the work of the national accounts system (NAS) department in *each* country. And NASes contain estimates of mean household income and mean consumption.<sup>1</sup>

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1. Not strictly since the definition of private final consumption expenditure (an NAS figure) is different from household consumption, and household income has to be approximated

And when the survey does appear, it is used to “update” and verify national accounts estimates for individual items of expenditure or income. Thus, the close correspondence between the two for many countries is not a function of the accuracy of the survey—it is a matter of definition, i.e., the survey estimates of expenditure, for individual items and/or the aggregate, are often taken as the estimate for the system of national accounts.

Thus, survey and national accounts are not competing estimates for mean expenditures—at least they were not in the old days. Today, statistical systems in most countries have become considerably more developed (at least in comparison with the practice 30 years ago), and consumer surveys (income or expenditure) are now one among several competing estimates.<sup>2</sup> Now what should be done?

## What Is the Problem?

That surveys and national accounts yield different means is neither surprising (their coverage is different, the prices they use can be different, etc.) nor a problem. In the 1960s in India (where all debates on poverty seem to have originated—as a wag said, in India they discuss poverty, in East Asia they remove it), there was intense discussion about the divergence of the survey mean from the national accounts mean. Does this sound familiar? Yes, except the divergence was a few percentage points in the late 1960s; in the last national survey (1999-2000), the survey estimate of mean consumption was only 55 percent of national accounts consumption.

So the problem is threefold. Less important, how much deviation is there between a survey mean and NA mean at a *point in time*?<sup>3</sup> More important, most often critically, the problem is the trend in the ratio over time—i.e., the degree of underreporting increasing or decreasing over time in percentage terms. (Note that with growth, the absolute underreporting will obviously go up over time and is not of much interest.)

Even this is not much of a problem if the “error” is random. But what if the error is *both* not random *and* has a *downward* trend (i.e., the surveys

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by per capita GDP. The NAS contains estimates of consumption of nonhousehold institutions in the economy—e.g., prisons and nongovernmental organizations. These differences are well recognized and can easily be removed to obtain a comparable NAS estimate of *household* consumption.

2. Not, obviously, for all countries. Several (e.g., China, Kazakhstan, Laos, and Vietnam) still use the survey mean as the mean for national accounts, often with a deflation factor of 3 to 12 percent to account for differences in coverage.

3. Throughout this discussion, the concern is with deviation after controlling for differences in definition and coverage.

are systematically capturing less and less of the true value of consumption)? Then there are genuine problems, and unless these problems are confronted, there are likely to be several possibly unintended consequences of a methodology that relies exclusively on the information contained in the surveys and that is purist in not correcting the survey data through the use of other (e.g., national accounts) data. This was observed to be the case with Milanovic's estimate of global inequality, an estimate that had excess baggage in the form of the average Korean being richer than the average Swede in 1993 (rather than being 40 percent poorer, as suggested by the NA), or the average citizen of the Central African Republic having the same income as the average Indian (rather than being 40 percent poorer).

The problem occurs because the survey means are now capturing less and less of the national accounts mean, and a different pattern is observed for different countries. The examination of the causes of this decline is beyond the scope of this book, though research is under way. A reasonable hypothesis is that new products are being missed, a conjecture put forward by Minhas and his colleagues (Minhas et al. 1986):

These surveys do not seem to capture a large number of new and emerging products, particularly in the field of consumer electronics, plastics, toilet goods and chemical detergents. In the absence of itemwise details of inputs as well as outputs in the unorganised sector, the CSO [i.e., national accounts] fails to make a number of needed adjustments. It is, therefore, necessary that the surveys of the unorganised sector are made more comprehensive in their scope and coverage in order to provide more reliable data in the future.

Another possibility is that the opportunity cost of time has gone up, even among the poor. Interview fatigue sets in, and/or the survey respondent has better things to do. Either way, the questions later on in the questionnaire will be answered less accurately.

Perhaps due to these genuine concerns, analysts and governments have almost always preferred to use *survey* distributions and *national accounts* means. India set the example by using this method, and it was not surprising that the world followed. Then a curious thing happened. The World Bank came out with a new poverty line and a new, exclusively survey-based method of measuring poverty (World Bank, *World Development Report 1990: Poverty and Development*; Ravallion, Datt, and van de Walle 1991). For the first time, the Government of India, and Indian academics, were followers rather than leaders in the poverty debate. An Expert Group constituted by the Government of India (hereafter, EGGOI) also changed its long-standing policy of using national accounts means to match survey means (Government of India 1993).

In line with the new World Bank practice, the new Government of India recommendation was to use only survey data.<sup>4</sup> As noted by both Bhalla

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4. There is some evidence to suggest that the originator of the first poverty line, and of the first method of estimating absolute poverty, the Planning Commission of the Government of India, meekly gave up its leadership role by uncritically accepting the recommendations

(2000b) and Deaton (2001a), no convincing explanation was given, or even an attempt made, by the Government of India report to explain the change in its long-standing policy of poverty measurement. “This [adjustment of survey means to national accounts means] 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 of the government of India” (Deaton 2001a, 135).

Nor was any explanation given by Ravallion, Datt, and van de Walle for the mega-paradigm shift. Neither EGGOI nor Ravallion and his colleagues provided any evidence of why, or how, the survey method was able to overcome its known disadvantages, particularly the decline in the ratio of survey to national accounts. One possible explanation for the changeover could have been the knowledge that in the most statistically advanced country in the world, the United States, the exclusive use of survey data for generating poverty estimates was the norm. So the adoption of the new method might have had no more an intellectual basis than to copy the US “best practice.” Although this (copying the United States) might be the recommended behavior for firms producing computers, it is unclear that this behavior is recommended for generating poverty estimates in poor countries, and in poorer statistical climes.

The political economy of the World Bank (and Indian) move to higher poverty estimates should not be underemphasized. The Government of India provides grants to states (and presumably the World Bank also grants monies for poverty reduction) on the basis of the estimates of poverty in the states or countries. If the average consumption is adjusted downward, and in a continuous fashion, more and more poverty will be shown than that which actually exists—and more and more money received by cash-starved state administrations (or governments). This is one governance, and moral hazard, problem that was actually encouraged by the sloppy change to survey means as a basis for measuring poverty.

## **There Is a Problem Even in the United States**

Even in the statistically advanced United States, there is a survey problem. The survey-based method is showing no decline in poverty in the United States for 30 years; per capita income in the United States has increased by 67 percent since 1968, and yet the proportion of people who are poor has stayed the same, at around 12-14 percent—that is, the mean income of the bottom 15 percent has remained the same in absolute terms!

Along with survey capture (see Triplett 1997 for an extended discussion), there are other problems with the US method of measuring poverty:

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of the World Bank to change the methodology to an exclusive survey-based method. See Bhalla (2000b, 2000d) for details.

an income measure is used rather than the preferred consumption measure; further, state transfer income is not counted as income. (Note that this problem (of transfers vs. income) would not arise in the case of consumption.)

But the largest problem, most likely, is the increasing divergence between survey and national accounts in the measurement of per capita income; about 55 percent in 1968 and 40 percent today—an increase in undercapturing of about 40 percent. If this undercapture ratio is assumed to be the same as in the 1960s, then even by the survey method, poverty in the United States would be half that which is reported (i.e., about 6 percent). Like India, the continuing politics of the United States's economic war on its own "poverty" should not be underemphasized, or underrated.

## In Defense of Surveys

A decade after the introduction of the new method, Ravallion<sup>5</sup> attempted to add up the advantages of both the new and old methods of generating means for poverty measurement. He concluded in favor of the new, exclusive survey method, a conclusion in which he is not alone.<sup>6</sup> Broadly, he emphasized the following four major problems with the NAS. First (though this is not taken so seriously by Ravallion himself), "households are the residual claimants in the NAS."

Some items in national accounts are obtained as a residual, and some items use a fixed "blowup" multiplier to get to the total. For example, in India, in the fruits and vegetables category, the national accounts authorities may obtain information on only two or three fruits and two or three vegetables and come up with a number for the consumption of *all* fruits and *all* vegetables. The reason this is not a serious deficiency is because if tastes remain relatively constant, which they mostly do, then knowledge about local price and income elasticities and the observed change in consumption of apples, oranges, and bananas can tell one a fair amount about the *change* in consumption of grapes and peaches. And similarly, knowledge about the change in consumption of tomatoes and cabbages can inform one quite a bit about the changes in consumption of lima beans and broccoli.

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5. Martin Ravallion, "Should Poverty Measures Be Anchored to the National Accounts?" *Economic and Political Weekly*, August 26-September 2, 2000, 3245-52.

6. Sundaram and Tendulkar state that the "the issue of accepting the NAS estimate of PFCE as more correct and reliable than the NSS estimate is far from settled" and seem to concur with Ravallion's conclusions: he "offers some cogent arguments against anchoring poverty measures to NAS" (K. Sundaram and Suresh Tendulkar, "NAS-NSS Estimates of Private Consumption for Poverty Estimation: A Disaggregated Comparison for 1993-94," *Economic and Political Weekly*, January 13, 2001, 119).

Second, Ravallion argued that the NAS includes institutional consumption, whereas household surveys do not, and this can result in a severe bias, particularly in democracies (like India) where campaign spending is important! To quote him:

The difference between the NAS and NSS [National Sample Survey] consumption numbers reflects in part measurement errors in the former and the fact that the spending of the (apparently growing) non-profit sector cannot be separated from household consumption when accounting for domestic absorption of measured output in the NAS. . . .

So replacing the NSS mean with consumption per capita from the NAS when measuring poverty would imply that campaign spending by politicians trying to get elected would automatically reduce measured poverty even if none of the money goes to the poor. And every rupee spent by an NGO [nongovernmental organization] would reduce measured poverty, even if none of the money went to the poor. . . . [Further,] it seems plausible that there has been substantial growth in spending by nonprofit enterprises.<sup>7</sup>

The NGO objection seems somewhat unrealistic because it would imply the share of expenditures of NGOs going up, and going up particularly in food consumption, a not so income-elastic or NGO-type consumption good. In the United States (see Slesnick 1998), the share of nonprofit organizations as a fraction of expenditures rose from 4.7 percent in 1959 to 12.1 percent in 1993. That is an increase of 7.4 percentage points over 34 years, and in a society where such growth has been the fastest. Even then, the increase is 2 percent per decade.

The third major problem with the NAS, according to Ravallion, is that rich people are missed more by surveys than the poor, so matching survey means to NAS would falsely raise the incomes of the poor:

It does not take much for the NSS to underestimate consumption. All it takes is for well-off sampled households to systematically refuse to participate in the survey, and be replaced by more compliant but less well-off ones, or for interview respondents to forget, or prefer not to reveal, items of consumption in the survey schedule.<sup>8</sup>

The fourth problem is that *included* rich people understate their incomes more than the included poor:

At an aggregate level, the claimed underestimation of consumption in the NSS would appear to rise as income increases. So it is quite possible—and certainly no less plausible than the distribution-neutrality assumption—that the underestimation of consumption growth is largely for the non-poor. . . . The more consistent

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7. Martin Ravallion, "Should Poverty Measures Be Anchored to the National Accounts?" *Economic and Political Weekly*, August 26-September 2, 2000.

8. *Ibid.*

**Table 7.1 Ratio of surveys to national accounts: Disturbing trends**

| Region                       | Income surveys |             | Consumption surveys |             |
|------------------------------|----------------|-------------|---------------------|-------------|
|                              | 1987           | 1998        | 1987                | 1998        |
| East Asia                    | 55.6           | 46.4        | 82.4                | 80.8        |
| South Asia                   | 74.9           | 61.8        | 73.1                | 55.7        |
| Sub-Saharan Africa           | 69.0           | 63.1        | 125.1               | 114.9       |
| Middle East and North Africa | 64.0           | 43.6        | 85.6                | 81.1        |
| Latin America                | 74.3           | 60.7        | 74.8                | 61.8        |
| Eastern Europe               | 191.9          | 53.7        | 76.5                | 67.5        |
| Industrialized world         | 49.0           | 48.3        | 64.1                | 63.2        |
| <b>Developing world</b>      | <b>65.1</b>    | <b>54.4</b> | <b>85.4</b>         | <b>76.5</b> |
| <b>World</b>                 | <b>73.0</b>    | <b>53.4</b> | <b>80.6</b>         | <b>73.6</b> |

Note: The figures represent the ratio of the survey mean income (or consumption) with respect to the national accounts GDP per capita (or private final expenditure per capita).

Sources: Deininger and Squire (1996); World Income Inequality Database, available at <http://www.wider.unu.edu/wiid>; Asian Development Bank (2002); Milanovic and Yitzhaki (2001).

*interpretation would seem to be that the rate of underestimation (error as a share of consumption) rises as consumption rises, implying that inequality is underestimated.<sup>9</sup> (emphasis added)*

Unlike the first two assumptions, the last two objections to the use of NAS data are potentially important; potentially because it is all dependent on the magnitudes involved. Below, an attempt is made to estimate these magnitudes on the basis of data from the Indian household survey for 1993-94.

## What Happened to the Survey/National Accounts Ratio?

Table 7.1 shows the pattern of the ratio of survey mean consumption to national accounts mean consumption. This ratio is designated as  $S/NA$  and is reported for the various regions of the world for 1987 and 1998. For the developing world, income surveys were capturing a very low fraction of national accounts in 1987—65.1 percent—and this ratio declined by an additional 18 percent from 1987 to 1998. This means that a poor person would have had to have increased her income by 17 percent in real terms over 11 years, or 1.6 percent a year, to be at exactly the same level she was in 1998 as she was in 1987. Above, we had emphasized the equivalence between changing income and changing poverty lines. *Because the surveys are now capturing less and less, it means that the poverty line is continuously being increased.* For the average income survey country,

9. Ibid.

**Table 7.2 Elasticity of survey means to national accounts means**

| Time period                  | Income surveys | Expenditure surveys |
|------------------------------|----------------|---------------------|
| <b>Before or during 1990</b> |                |                     |
| Number of observations       | 561            | 123                 |
| Number of countries          | 103            | 38                  |
| $R^2$                        | 0.92           | 0.82                |
| <b>Elasticity</b>            | <b>0.89</b>    | <b>0.94</b>         |
|                              | (.026)         | (.042)              |
| <b>After 1990</b>            |                |                     |
| Number of observations       | 201            | 177                 |
| Number of countries          | 85             | 75                  |
| $R^2$                        | 0.87           | 0.64                |
| <b>Elasticity</b>            | <b>0.92</b>    | <b>0.74</b>         |
|                              | (.036)         | (.064)              |

Note: A simple log-log model—(log) survey mean and (log) national accounts mean (GDP per capita or private final expenditure per capita)—is used to estimate the elasticity between the survey means and national accounts means. Figures in brackets are robust standard errors.

Sources: Deininger and Squire (1996); World Income Inequality Database, available at <http://www.wider.unu.edu/wiid>; Asian Development Bank (2002); Milanovic and Yitzhaki (2001).

the poverty bar got raised from \$1.30 in 1987 to \$1.55 in 1998, all in real 1993 prices.

The situation with a consumption survey country (like India or Vietnam) is equally bad. The average S/NA ratio for developing countries declined from 85.4 to 76.5 percent, or 10 percent. This means that the per capita consumption of the poor would have to have increased by 10 percent for the poor to be thought of as having the same consumption as before. Regardless of which part of the developing world one lived in, the poverty line (e.g., \$1.08) got raised to \$1.19 in the space of just 11 years. The implication for the head count ratio is that, on the basis of survey measurement errors alone, poverty is likely to have been underestimated in the world in 1998 (or 2000) by about 8 to 10 percentage points; that is, real, unobserved “true” world poverty—according to official data, World Bank methods, “consumption” purchasing power parity (PPP) exchange rates, and a low but constant S/NA ratio—is about 14-16 percent, rather than the stated 23-24 percent.

Table 7.2 reports on a simple log-log regression of survey means to national account means for consumption and income survey data and for two time periods, surveys before 1990 (mostly in the 1980s), and surveys from 1991 to 2000. The elasticity for income surveys does not change much—it was 0.89 in the 1980s and 0.92 in the 1990s. For both these periods, the elasticity was significantly less than unity.<sup>10</sup> For *expenditure*

10. Most surveys in industrial economies are income surveys, and as shown in table 7.1, the S/NA ratio in these economies is staying fixed at about 50 percent; hence, an unweighted regression shows a constant, rather than a declining, ratio.

distributions, during the 1990s elasticity collapsed from a level of 0.94 and not different from 1 to a level of 0.74 and significantly less than unity (with a standard error of 0.06).

The decline of the S/NA ratio in the 1990s is transparent. At the end of the 1980s, its elasticity was close to unity. Then came the adoption of the World Bank method of measuring poverty by survey means, and the elasticity promptly collapsed!

Summarizing, the three results on S/NA suggest the following. First, income surveys capture a lot less of the corresponding national accounts estimate than do consumption surveys. Second, there is no trend in the underreporting for income surveys in industrialized economies, but a declining trend for developing ones. Third, there appears to be a strong downward trend in the capture ratio for consumption surveys. As it happens, poverty estimates are mostly based on these (consumption) surveys.

That this downward trend in S/NA for consumption is near universal is also suggested by Triplett's (1997) analysis of data for the most statistically sophisticated country, the United States. He finds that the NAS estimates of per capita expenditures have grown at about 1 percent a year faster than survey estimates for the period 1984-94. He also finds that the underestimation of food was about the same as that of durable goods—both at about 0.7 percent a year. Durables less motor vehicles are an item with the largest amount of underestimation—1.7 percent a year.

The US data provide a perspective on developing-country (e.g., India) underestimation problems. The magnitudes involved are radically different—rather than a 1 percent difference a year, the difference is more than 3 times that; that is, the survey and NA data in India have diverged by more than an average of 3 percent a year since the early 1980s.

## **Unintended Consequences of Moving to Survey Means**

The simple changeover to a survey-based method of measuring means was to have several unintended consequences. With the all-important ratio moving haphazardly and unpredictably, several level calculations literally went haywire. Some of the more problematical of these calculations are reported in table 7.3, which contains per capita income and consumption levels, circa 1993, for both the survey and national accounts, and for both consumption (referred to as World Bank) and official PPP exchange rates (referred to as simple accounting procedure, or SAP). The data for World Bank survey income are taken from Milanovic and Yitzhaki (2001) (referred to as WB1); the data for World Bank survey consumption are obtained from the World Bank Web site (referred to as WB2). All data are in per capita annual terms, PPP 1993 prices.

Only a few countries are listed in the table, but a cursory perusal suggests that there are several anomalies, and several problems, if survey

**Table 7.3 Estimates of income and consumption per capita, circa 1993 (1993 purchasing power parity dollars)**

| Economy and survey type   | Income          |                  |                  | Consumption     |                  |                  |
|---------------------------|-----------------|------------------|------------------|-----------------|------------------|------------------|
|                           | NA <sup>a</sup> | Survey           |                  | NA <sup>a</sup> | Survey           |                  |
|                           |                 | SAP <sup>b</sup> | WB1 <sup>c</sup> |                 | SAP <sup>b</sup> | WB2 <sup>d</sup> |
| <b>Income survey</b>      |                 |                  |                  |                 |                  |                  |
| China                     | 2,073           | 931              | 1,122            | 937             | 891              | 817              |
| Guyana                    | 3,077           | 3,269            | 2,889            | 1,930           | 1,409            |                  |
| Brazil                    | 6,053           | 5,208            | 3,473            | 3,637           | 3,129            | 2,279            |
| Czech Republic            | 10,986          | 4,757            | 4,678            | 5,486           | 2,544            | 2,475            |
| South Korea               | 11,391          | 9,822            | 9,666            | 6,139           | 3,702            |                  |
| Singapore                 | 16,797          | 6,036            | 7,431            | 7,535           | 6,112            |                  |
| United Kingdom            | 17,994          | 10,524           | 9,440            | 11,626          | 8,894            |                  |
| Australia                 | 19,256          | 8,602            | 9,087            | 11,341          | 6,626            |                  |
| Hong Kong                 | 20,310          | 10,711           | 12,935           | 11,638          | 9,640            |                  |
| Japan                     | 22,375          | 12,244           | 11,668           | 13,118          | 9,389            |                  |
| Switzerland               | 24,942          | 14,992           | 14,068           | 14,943          | 11,749           |                  |
| Sweden                    | 18,633          | 10,213           | 9,451            | 9,884           | 7,086            |                  |
| United States             | 26,026          | 11,139           | 12,321           | 17,594          | 9,849            |                  |
| <b>Expenditure survey</b> |                 |                  |                  |                 |                  |                  |
| Tanzania                  | 463             | 267              | 1,037            | 394             | 779              | 879              |
| Ethiopia                  | 523             | 302              | 738              | 438             | 856              | 508              |
| Uganda                    | 861             | 667              | 622              | 767             | 859              | 678              |
| Rwanda                    | 905             | 700              |                  | 807             | 691              | 462              |
| Central African Republic  | 997             | 575              | 512              | 829             | 456              | 492              |
| Kenya                     | 1,009           | 582              | 1,147            | 600             | 959              | 1,052            |
| Nepal                     | 1,026           | 1,053            | 643              | 798             | 822              | 623              |
| Bangladesh                | 1,162           | 1,057            | 706              | 954             | 758              | 554              |
| Senegal                   | 1,205           | 933              | 510              | 960             | 714              | 726              |
| Ghana                     | 1,603           | 925              | 1,664            | 1,265           | 1,441            | 1,201            |
| India                     | 1,608           | 1,161            | 524              | 1,104           | 679              | 514              |
| Pakistan                  | 1,615           | 1,286            | 798              | 1,212           | 1,010            | 618              |
| Nicaragua                 | 2,233           | 1,564            | 4,338            | 2,094           | 3,584            | 654              |
| Indonesia                 | 2,496           | 1,430            | 884              | 1,461           | 748              | 822              |
| Jamaica                   | 3,563           | 2,589            | 1,674            | 2,204           | 1,602            | 1,421            |
| Algeria                   | 4,487           | 2,915            | 2,455            | 2,458           | 2,752            | 1,820            |
| Thailand                  | 5,136           | 2,874            | 2,001            | 2,765           | 2,071            | 1,670            |

NA = national accounts, PPP = purchasing power parity, SAP = simple accounting procedure, WB = World Bank

a. NA figures represent nominal PPP data deflated by the international PPP deflator (equal to the US GDP deflator).

b. SAP survey data are the NA data multiplied by the survey capture ratio, i.e., the ratio of survey mean incomes (or consumption) to the corresponding NA means.

c. WB1 income data represent nominal PPP data deflated by deflators presented in Milanovic and Yitzhaki (2001).

d. WB2 consumption data represent nominal PPP data deflated by the "consumption PPP" exchange rates on the World Bank Web site.

Note: In many cases, survey data are not available for the year 1993. In such cases, the table presents either the closest earlier year for which data are available, or, where earlier data are not available, data for the earliest later year. E.g., if the latest survey took place in 1991, the 1993 figures reflect these values.

Sources: Deininger and Squire (1996); World Income Inequality Database, available at <http://www.wider.unu.edu/wiid>; Asian Development Bank (2002); World Bank, *World Development Indicators*, CD-ROM; WB1: Milanovic and Yitzhaki (2001); WB2: <http://www.worldbank.org/research/povmonitor/>.

data are used (regardless of whether such data are provided by SAP, WB1, or WB2). If the widely accepted national accounts figures are taken as a base (what is being discussed here is just the means, not the distribution of income or consumption), then the problems are too glaring to ignore. Starting with the income surveys, China is observed to be a third as rich as Guyana, when NAS indicates that it was about 50 percent richer. South Korea is observed to be 30 percent richer than Singapore (a country that for a few months in 1995 had the same per capita income as the United States), when NAS states that Singapore is almost 50 percent richer.

The problems are possibly worse with the consumption surveys, especially given the diversity in the capturing of national accounts. India is shown to be just as poor as the Central African Republic, and about 30 percent poorer than Ethiopia. War-ravaged Nicaragua is almost twice as rich as Algeria. Note that what the table compares is not relatively intractable data, such as the mean incomes of a particular percentile or quintile. What is being compared is the most robust of all variables—a mean, a summary statistic that should cancel out many errors at smaller levels of aggregation.

All methods, and estimates, have to pass a “smell test” to survive false empiricism.<sup>11</sup> The example of Koreans being relatively richer beyond their own wildest imagination is one such smell test; Indians being considerably poorer than Ethiopians is another. There are several articles giving reasons for the extraordinary finding that growth has accelerated and poverty not come down. There are versions about “quality of growth”; about regional variations; about the need for new policies; about globalization having failed; and about the need for nonmarket instruments. The intellectual support for these ideas is derived from data that suggest that India is manifestly poorer than Senegal, that the average Korean was richer than the average Swede in 1993, and so on.

## **Do National Accounts Estimates Have Problems?**

Although the emphasis above has been on problems with survey estimates of mean consumption, and therefore on survey-based estimates of absolute poverty, it is obvious that national accounts data also suffer from problems. The reason not much emphasis has been placed on errors in NAS is because of the expectation that the law of large numbers operates; the NAS collects data from different sources, reconciles different estimates,

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11. Milton Friedman is rumored to have brought down the house, and a famous theoretician, with the argument that the theoretician’s conclusions were not consistent with the operations of a Mom and Pop corner store.

and (with input from survey experts and economists) continues to update procedures.<sup>12</sup>

That some of these procedures result in guesstimates that are off the mark is obvious. The assumptions about blowup factors can be wrong, as can the assumptions about cross-elasticities. These can, and do, result in the NA mean being off the “true” mark by a few percent or so for any given year; in the case of surveys, for some countries, the error *compounds* at the rate of 1 to 2 percent a year.

This is one interpretation, and conclusion—that is, both surveys and national accounts have level errors, and trend errors are unlikely to occur in NAS because of the law of large numbers and a greater chance of errors canceling out. In particular, it is *unlikely* that ratio errors (e.g., mean NAS consumption as a ratio of the unobserved mean “true” consumption) are a trend in national accounts.

The problem is not with uncertainty about the distribution of survey expenditures (a difficult exercise) but with the *mean* of these expenditures. National accounts offer a different estimate of the mean, but a priori, it is difficult to say which source is to be preferred. The choice between the two involves a judgment that one source is more accurate. How is that to be determined? It can, if consumption (or income) data are available from a *third* source, and knowledge and assumption that the third source is more “accurate.” This may seem like an impossible task—but actually, it is more tractable than it seems.

## Choosing between Surveys and National Accounts

Two solutions to the problem of choosing between survey and national accounts are provided. The first presents details on what to do if the question is to compare the relative, and absolute, accuracies of the two sources. This is an exercise that needs to be conducted for each individual survey or set of surveys.<sup>13</sup> The second solution pertains to what is to be done with poverty measurement when such a detailed exercise is not possible. The recommended procedure is to raise the poverty line by an amount that will compensate for the known problems in survey data

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12. In India, the survey-based estimates used to be continually higher than NAS for foodgrain consumption. With improvements in NAS methodology and data collection and verification, the ratio has now reversed and is as predicted (see Minhas 1988).

13. Bhalla and Glewwe (1985, 1986) offer such a method with tests for Sri Lanka; Bhalla (2000b) extends this analysis to Indian data for 1993. A Government of India Planning Commission research project is presently under way to examine the issues about poverty measurement raised by the results contained in the NSS surveys, especially since the early 1980s; see Bhalla (2002c).

(e.g., undercoverage of the rich, and a presumed greater underreporting by the rich).

It is possible to use a third source to reconcile survey and national account estimates. Using Sri Lankan survey data for 1969-70 and 1980-81, Bhalla and Glewwe (1985, 1986) offer an Engel curve method of choosing between the survey and expenditure means. Bhalla and Glewwe construct *survey* price-indices;<sup>14</sup> look for consistency checks within the household survey data (prices and quantities of individual consumption items); and compare the estimates of survey data on prices and quantities with national accounts data, as well as with data on production, imports, food distribution, and so on. In other words, the attempt is to identify an additional third source for the same (broad) units of information.

This comparison allows a first cut at determining which source is more accurate. The second cut involves estimating demand for broad categories of consumption, with simple assumptions about price and income elasticities. Even if these elasticities are not known, simulations can be done to converge on the likely set of elasticities. (The broad Engel pattern is known: food, after a minimum level, has an elasticity below 1; within food, items like edible oils, sugar, and meat have higher elasticities than potatoes, cereals, etc.) These computations yield the likely predicted change in total consumption expenditures, which can then be compared with the change in the survey and NAS means.

The result: The survey data were more accurate than the national accounts data! Probing deeper, it turned out that the government of Sri Lanka was holding back increases in its inflation measure, apparently to defer obligatory cost-of-living increases for union and government employees. Thus, the price deflator was being understated, resulting in a larger than “actual” increase in real consumption.

Using this same method with Indian data, Bhalla (2000b, 2002c) shows that—on the basis of external data on the availability of cereals, edible oils, and sugar, and some prior income and own-price elasticities—the real growth in per capita consumption between 1983 and 1999 was 48.4 percent, or 2.5 percent a year. The annual inflation rate during these years averaged 8.3 percent. Thus, in nominal terms, total expenditures increased at an annual rate of 10.8 percent. The survey-based estimates register only 9.8 percent growth a year. National accounts indicate that the increase was 11.4 percent a year. The Engel curve estimate (10.8 percent a year) lies in between (and closer to national accounts than the survey estimate of 9.8 percent per annum); but given that, by construction and definition, the Engel curve estimate is a *lower* bound to the “true” estimate, it implies

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14. That just using these internal (survey) prices can cause a huge difference to poverty estimates for India has been documented by Dubey and Gangopadhyay (1998) for the 1987 and 1993 surveys, by Deaton and Tarozzi (1999) for the same surveys, and by Deaton (2001b) for the 1987, 1993, and 1999 surveys.

that the NAS is more right than the survey. (Data on wage growth confirm this interpretation—see table 7.3.)

## By How Much Do Rich People Understate Expenditures?

We now look at an example from Indian household data for 1993-94. The Engel curve computations do not solve the problem of identifying whether the rich understate their expenditures to a greater extent than poor people. A method to do just that is outlined in Bhalla (2001a), a paper, not coincidentally, prepared for the 50th anniversary of the National Sample Surveys in India. This paper follows in the tradition of several studies in the 1970s and 1980s that searched for the elasticity of underreporting in income surveys.<sup>15</sup> This paper also improves upon the computations contained in the work of Sundaram and Tendulkar,<sup>16</sup> and consequently it reaches somewhat different conclusions about the accuracy of survey data for deductions on poverty levels, or decline, in India.

Note that the issue is not the validation, or comparison, of the consumption or income means; rather, the issue is who is underreporting (or overreporting) and by how much. The detailed analysis is reported for India below. Although the example is for only one country, and one year (1993-94), it is illustrative. It is unlikely that the same result will not hold for other countries. Validation for other countries requires access to both household surveys and detailed access to expenditure accounts in the national accounts, something beyond the scope of this book.

The following methodology suggests that, to some degree of accuracy, the different underestimation levels can be identified. Assume that the *individual* item (e.g., cereals, pulses, vegetables, fruits, dry fruits, consumer durables, or education) expenditures as tabulated by the national accounts are correct. The aggregate mean expenditure as computed by the NA was shown to be correct earlier. An assumption is necessary in order to proceed to the second part of the analysis—how much is underestimated by whom. With this assumption, an average multiplier can be obtained—this average is the ratio of the adjusted sum of individual and item-specific expenditures, to the sum of expenditures in the survey data. If this itemwise multiplier is used, then in the aggregate, the adjusted survey means will match the NAS means, for *each individual item and for the total*. Is any additional assumption being made with this method? Yes, that relative

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15. See Bergsman (1980) (and references contained there) for an analysis of underreporting in Latin America, Renaud (1976) for a discussion of South Korea, and Bhalla and Vashishtha (1988) for an analysis of the NCAER income distribution survey of 1976.

16. K. Sundaram and Suresh Tendulkar, "NAS-NSS Estimates of Private Consumption for Poverty Estimation: A Disaggregated Comparison for 1993-94," *Economic and Political Weekly*, January 13, 2001.

prices and aggregate expenditure (and tastes) determine the revealed survey consumption level of each household!

Figure 7.1 reports the item-specific multipliers. Foodgrains reflect an understatement of about 10 percent, but more highly valued food products (milk and milk products, fruits, and vegetables) show considerably higher underestimation—here the ratio is as low as 53 (i.e., the surveys are able to capture only about *half* of national accounts consumption). As expected, durables are also vastly understated, but the highest understatement is for clothing and footwear, for which the surveys capture only 40 percent of NAS consumption.

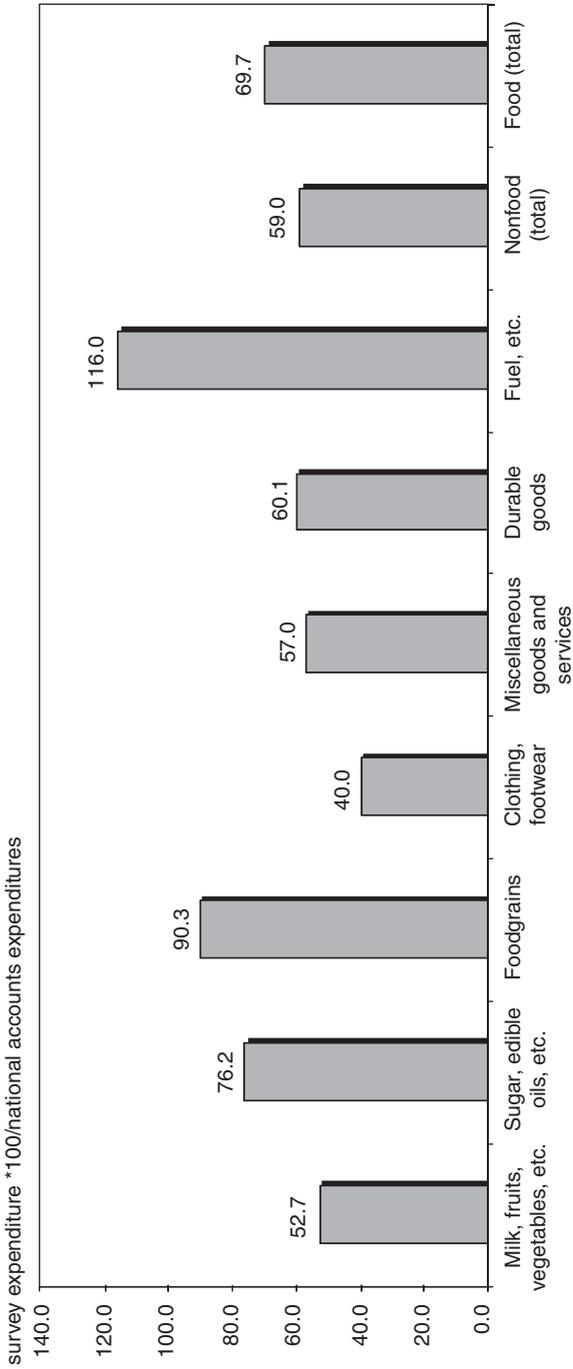
Figure 7.2 aggregates individuals according to their per capita expenditures, and reports the resulting average multiplier for each decile. This multiplier is the inverse of the S/NA ratio. It shows by how much the survey estimate has to be multiplied to “match” the national accounts estimate. The results are striking, and given the data in the previous table, not that surprising. Even for the poorest decile, the underestimation is on the order of 30 percent. The multiplier is progressively higher for richer households, but the variation for the first eight deciles is in the narrow range of 30 to 46 percent. The average multiplier for the first five deciles is 1.35; that for the top half is 1.46. The average for the entire population is 1.41.

The relative constancy of the average decile multiplier may seem counterintuitive for it is a priori reasonable to expect that most of the missing consumption would be accounted for by the rich. It is! The adjustments *preserve* the original pattern of distribution; because the top 20 percent of the population have about 45 percent of the expenditures, they have a claim to 45 percent of the *missing* expenditures. Further, note the large multiplier for food items—1.43 percent, compared with 1.69 for nonfood items. Food items have a low income elasticity—and there is a physical limit to how much extra food the rich can consume, even if the rich eat only caviar. Hence, a “constant” multiplier is not only plausible but also likely.

So the “benefits” of the underestimation of food items accrue “disproportionately” to the nonrich, and likewise the benefits of the underestimation of nonfood items (e.g., durables) accrue “disproportionately” to the rich. Many poor households do not report any expenditures for durables or report a very small share; consequently, they get zero or very little “benefit” from the large amount of missing expenditures on durables.

The traditional method of matching survey data with national accounts was to assume a uniform multiplier—in this example, 1.41. If such an assumption is made, then the error made with regard to the first five deciles is that their consumption would be overstated by 4.4 percent (1.41 divided by 1.35) and that for the top half by 3.5 percent. The fact that so little error is caused by matching surveys with national accounts is

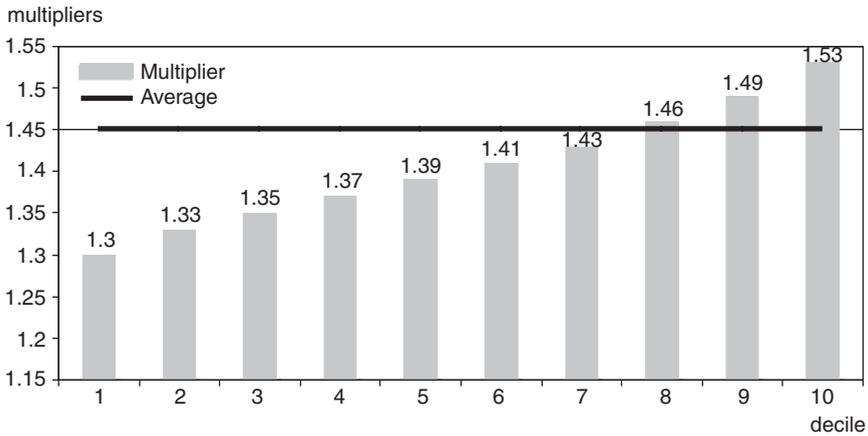
**Figure 7.1 Example of mismatch, survey and national accounts, India, 1993-94**



Note: For each item, a match is obtained between the survey expenditure per capita and national accounts estimate. This item multiplier is then imputed to all households. The numbers above each bar reflect the proportion of expenditure captured by the survey; e.g., for foodgrains, the surveys are capturing 90.3 percent of the expenditure as stated by the national accounts; for clothing, 40.0 percent, etc.

Source: Bhalla (2001a).

**Figure 7.2 National accounts adjustment multipliers for different deciles, India, 1993-94**



Note: Households are ordered according to the raw unadjusted per capita expenditure. The numbers reflect the average multiplier for each decile; e.g., to match national accounts at the aggregate level, the expenditures of the first decile have to be multiplied by 1.3, those of the 10th decile by 1.53, etc.

Source: Bhalla (2001a).

reassuring support for the originators of this method—the Government of India; followed by the World Bank via Ahluwalia, Carter, and Chenery (1979); followed by most development economists before the quiet “survey is all” revolution of the 1990s.

## Estimating Undercoverage of Rich People

We now look at another example from Indian household data for 1993-94. One problem remains: The noncoverage of certain mostly rich households is not solved by the calculation of the item multipliers. There is no objective, “untouched-by-human-hands” way to adjust for these missing people and their large expenditures. These people are “missing” from the surveys because they do not get onto the interviewer schedules or because interviewers get scared away by electric gates or guards at the entrances to their mansions. But some bounds to the magnitude of their consumption can be offered, and bounds are easier for consumption than for income. It is likely that such households constitute less than 2 percent of the population. Such a percentage would mean more than 20 million individuals in India and China and 2.5 million in the United States—clearly significant proportions!

The average median consumption share of the top percentile in developing countries for the past 20 years is 7.5 percent; the average median share for the 99th percentile is 3.6 percent. Thus, a very safe assumption is that 10 percent of NAS consumption does not accrue to the surveyed population at all—i.e., if mean NAS consumption is 100, only 90 percent is consumed and 10 percent is missing and allocated entirely to the missed households—which could include, in addition to rich individuals, institutional NGOs, prisons, and hospital personnel missed by consumer surveys.

## The SAP \$1.50 Poverty Line

Above, it was mentioned that there were two genuine problems with the use of national accounts means as proxies for survey means. First, again, the richer surveyed households might understate their consumption to a greater degree (in proportional terms). Second, a “large” proportion of rich households are never surveyed by surveys. These two factors are apparently the reason for the decision to eschew national accounts in favor of surveys.

The above two sets of figures on the multiplier and the missed-out consumption allow one to calculate absolute poverty using distribution data from surveys and mean data from national accounts—a marriage of convenience, if not a perfect marriage. Note that an understatement of survey expenditures can be incorporated, for calculations of the poverty ratio using national accounts, via an overstatement of the poverty line. Recall that in the case of the line of Ahluwalia, Carter, and Chenery, the poverty line based on national accounts was \$1.25 per capita per day, at 1985 prices, compared to a poverty line of \$1 a day using survey means—i.e., the NA poverty line has to be raised by approximately the amount of consumption that the surveys are missing out.

Analogously, knowledge about undercoverage, and understatement, can yield an equivalent national accounts poverty line—a poverty line that will consistently imply the same understatement over time. The above calculations suggest that the multiplier is lower for the bottom half of the population by 4.4 percent. If NAS is being used, then the poverty line should be *raised* by this amount. Similarly, to account for the missed income of 10 percent consumed by the missed-out rich households, the poverty line needs to be raised by an additional 10 percent.

SAP uses national accounts means of consumption, with the above two important adjustments. If a baseline poverty line of \$1.30 is chosen, then the fact that the surveys miss the top 2 percent of households (with consumption equal to 10 percent of the total) is factored by moving the poverty line to the quantity (1.30 divided by 0.9), or \$1.44. Analogously, if the top half of the population understates its expenditures by 3.5 percent

more than the bottom half, then this can be incorporated into the calculations by dividing the poverty line by (1 minus 0.035), or 0.965, which yields a poverty line of (1.44 divided by 0.965), or 1.497; rounding up, one obtains a poverty line of \$1.50 a day.

To summarize, the above calculations imply four points. First, the base poverty line is defined as \$1 a day, at 1985 prices, or as \$1.30 a day at 1993 prices. Second, survey means are deficient or are likely to be measured with considerable error. Third, simple matching of survey means with national account means is incorrect, because such a procedure assumes that the poor understate their expenditures by the same amount as the rich. Fourth, such a procedure is also incorrect because it attributes to the poor the consumption expenditures of rich households not covered in surveys.

Using the 1993-94 Indian consumption expenditure survey as a benchmark, it is observed that *the errors inherent in using NAS means are corrected by increasing the poverty line by approximately 15 percent, from \$1.30 per capita per day to \$1.50 per capita per day*. Thus, whenever national accounts data are used for calculating poverty, the survey poverty line is inflated by a factor equal to the quantity (1.50 divided by 1.30), or 15.4 percent. Whenever an NA definition of a poverty line is used (e.g., PPP \$2 a day), then the equivalent survey poverty line is obtained by deflating the NA line by 15.4 percent. Within this adjustment framework, alternative calculations based on surveys and NA can be compared, and contrasted—and poverty can be calculated for the \$1.30-a-day (surveys) or \$1.50-a-day (national accounts) poverty lines and done so for the period 1950-2000.

## “Smell” Tests for Indian Poverty Estimates

The largest divergence between surveys and national accounts, for expenditure surveys, and the largest downward trend of this divergence, has been for India (survey expenditures only accounted for 55 percent in the year 1999-2000). It is the case that one of the largest deviations between official and “consumption” PPP exchange rates is also for India. It is also true that of the world’s 1.2 billion poor people estimated by the World Bank for 1999, about 350 to 400 million reside in India.

It was also noted that there was *no* divergence between World Bank consumption and official PPP exchange rates for China, and that the survey estimate of mean consumption for China has been above 80 percent and closer to 90 percent for most of the years in the past two decades. *So the real test of which estimate of the scale of global poverty (1.15 billion or 650 million people) is right may have to do with which method gets the estimate of the number of poor people right for India.*

Using Engel curve methodology, and the Indian poverty line (equal to PPP \$1.25 per capita per day at 1993 prices), Bhalla (2000b) had estimated

absolute poverty in India to be about 15 percent. At that time, the most recent official estimate of poverty in India was 42 percent (National Sample Survey of January-June 1998). The World Bank poverty figures for South Asia had hinted (because, unlike China, no explicit estimate was published) that poverty in India was about 45 percent, on the basis of a 16 percent *lower* \$1.08 poverty line.

## Estimating Poverty in India in 1999

Figure 7.3 lists the various estimates of poverty in India for 1999-2000. Conveniently, the population for that year was 1 billion; so the number of poor divided by 10 also yields the head count ratio.

According to the national accounts data (and, therefore, a poverty line equal to \$1.50, not \$1.30, to account for the undercoverage of rich people and understatement by them), poverty in India was only 5 percent in 1999. Although this might appear unduly low, it may not be, especially if one considers the fact that the household surveys are missing about *half* of total NA consumption.

## An Estimate of Poverty Based on Household Employment and Expenditure Surveys

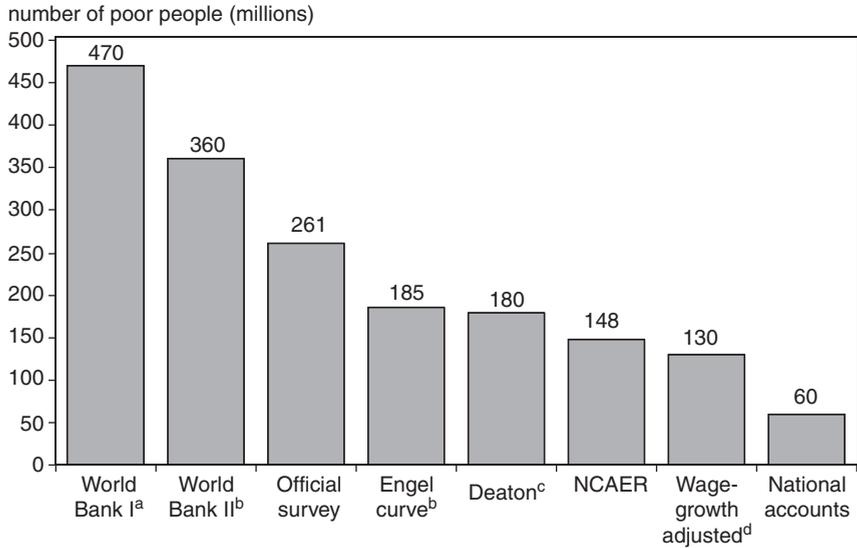
There is one estimator of total consumption in India, which meets all the exacting demands of a survey-based estimate.<sup>17</sup> Apart from consumer expenditure surveys on which official poverty estimates are based, the National Sample Survey Organization has also been conducting a “wages and unemployment” survey. This survey, conducted every 5 years, asks for wage and employment information from respondents. The survey data on the wages of casual workers in rural areas (the lowest-paid workers in the country) can be used to estimate the lower bound to average consumption, and therefore the upper bound to poverty, in 1999. These data suggest a very different story of India’s development than that indicated by the NSS *consumption* data (which are gathered by the same organization, but using a different survey interviewing different sets of households).

Nominal wages (median) of the most unskilled rural workers, termed “casual workers” in the survey schedule, increased at an average annual rate of 11.4 percent for 16 years, from 1983 to 1999 (with women showing a higher average growth of 11.9 percent in comparison with 11.2 for men). This increase in rural casual worker wages is both substantially above the increase in nominal consumption of the consumption survey (an annualized rate of 9.8 percent a year) and almost identical to the increase in

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17. This section is based on Bhalla (2002a, 2002c).

**Figure 7.3 Alternative estimates of the number of poor people in India, 1999 (millions)**



NCAER = National Council of Applied Economic Research

a. The World Bank I and World Bank II estimates are derived from data posted on the bank's Web site. The World Bank I estimate uses the international poverty line of \$1.08 per day per capita (1993 prices), whereas the World Bank II estimate is based on the official Indian poverty line, \$1.25 per day per capita in 1999.

b. The Engel curve estimate uses production, exports, import data for food grains, sugar, and edible oils, and derived estimates of consumption to obtain the growth in real consumption, 1983-99. See the text and Bhalla (2002a) for details.

c. Deaton (2001c) uses internal price indices for 1987-88, 1993-94, and 1999-2000 to get at estimates of "true" inflation.

d. The wage-growth adjusted estimate uses estimates of wage growth for casual workers in agriculture for 1983-99 and imputes this change to the consumption growth in the economy, 1983-99. See the text and Bhalla (2002a) for details.

Note: All the above estimates (except two) are based on National Sample Survey (NSS) data for India. The exceptions are the NCAER estimate, which is based on the NCAER Household Survey for 1998-99 (see Bery and Shukla 2002 for the details); and the national accounts estimate, which uses a poverty line that is approximately 20 percent higher to account for undercoverage of rich people, understatement by rich households, etc.

Sources: NSS 1999-2000 Consumer Expenditure Survey; Deaton (2001b); Bery and Shukla (2002); World Bank: <http://www.worldbank.org/research/popmonitor>.

per capita consumption revealed by the national accounts (11.6 percent a year). There are several different consumption deflators, but all converge to an annualized inflation rate of about 8.3 percent a year.

Thus, real wages of casual workers in the rural areas of India almost certainly increased by almost the same amount as per capita consumption, according to NAS—about 3.1 percent a year. Unemployment during these years stayed constant, at between 4 and 6 percent—and it is a bit hard to argue that unemployment levels showed a rising trend when real wages showed a trend increase of more than 3 percent a year in the most competitive labor market in the country. This increase in real wages therefore translated into an increase in real incomes, and therefore into an increase in real consumption. Some of it could obviously have gone into savings, but what is being discussed here are the wages of the poorest people, so this “leakage” into savings is unlikely to be large.

What level of poverty in 1999 is suggested by the growth in rural wages from 1983 to 1999? The survey data for 1999 cannot be used for the forecast, because the survey in 1999, apart from facing methodological contamination in the form of 7- versus 30-day recall for food consumption, also faces contamination in the form of the survey capturing about 25 percent less of national accounts than the 75 percent captured by the 1983 survey.<sup>18</sup> If the distribution of consumption did not change between 1983 and 1999 (and all indications are that it did not change by much; the share of the first quintile is reported by NSS as 8.3 percent in 1983 and 8.7 percent in 1999), then the 1983 consumption survey, and the real growth in rural wages from 1983 to 1999, can be used to project poverty in India in 1999.

Thus, if rural real wages grew at 3.1 percent for 16 years, the average real consumption in rural India in 1999 would be 64 percent higher. The poverty ratio according to the Indian poverty line for this higher level of consumption in rural India is 13 percent in 1999. If it is now assumed that wages of the urban poor in India grew at the same rate as those of the rural poor, then, coincidentally, the same figure for urban poverty (13 percent) is obtained. Thus, a conservative upper bound for poverty in India according to survey data is 13 percent in 1999. The Indian poverty line is equal to PPP \$1.25 a day, so this estimate is also representative of poverty in India according to the international poverty line of \$1.30 a day.

In the above calculation there are no PPP transformations involved, no national accounts, no changing ratio of surveys with respect to national accounts. The data used are household survey data for 1983; the assumption employed is that consumption expenditure of the poor increases one-for-one with growth in wages of casual workers in rural areas, mostly in

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18. This implies, of course, that the incomes of the poor would have to rise by 25 percent in real terms between 1983 and 1999 before any decline in the poverty ratio is observed.

agriculture. The result: the head count ratio is 13 percentage points lower than (or half of) the official head count ratio of 26 percent as computed by the 1999 consumer expenditure survey.

### **Other Estimates of Poverty in India, 1999**

Using a different survey (the NCAER MISH survey of households), Bery and Shukla (2002) estimate poverty to be 14.8 percent in 1999. Using internal (survey) price deflators for the survey years 1987-88, 1993-94, and 1999-2000, and ignoring methodological problems created by survey design,<sup>19</sup> Deaton (2001b) finds that the head count ratio in India in 1999 was 18 percent. The Engel curve method (discussed above) yields an almost identical figure for 1999: 18.5 percent.

### **What Was the Real Head Count Ratio of Poverty in India in 1999?**

The official figure for poverty in India in 1999 was 26.1 percent. This is a much lower figure than the vastly higher official figure of 42 percent that was reported on the basis of the year earlier 1998 consumer expenditure survey. The largest figures for poverty in India are those of the World Bank. Two estimates are shown in figure 7.3. One of them, World Bank I, is an estimate based on not the Indian poverty line of \$1.25 a day (as are all the other estimates reported in the figure) but a 13 percent lower poverty line of \$1.08 a day. According to this estimate, there are 360 million poor people in India.

But according to the Indian poverty line of \$1.25, there are 470 million poor people in India (World Bank II). Using the same household survey data, the Indian poverty line, and consumption PPP conversions, the World Bank II estimate of poverty in India, at 47 percent, is nearly double the official government of India estimate of 26 percent. Even with the lower poverty line (World Bank I), the estimate is 40 percent higher. And this lower estimate is almost three times the estimate of poverty suggested by a combination of household expenditure and employment survey data for India.

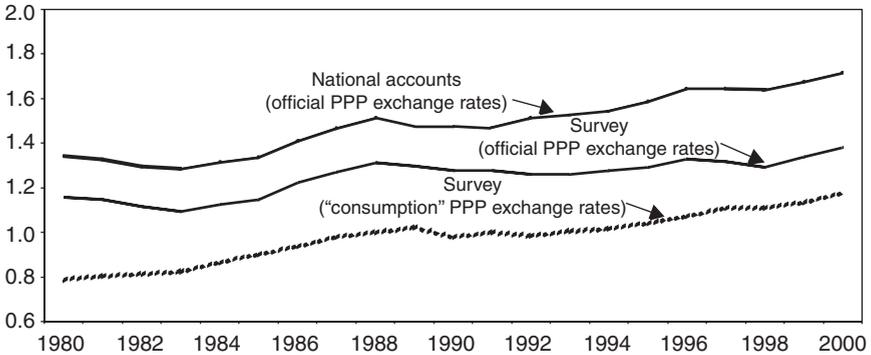
The answer to the question—how much poverty in India in 1999 based on the Indian poverty line of PPP \$1.25 a day—is that it is substantially less than most people have calculated and is close to 13 percent.

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19. The 1999-2000 National Sample Survey asked the respondents for their estimate of food consumption during the past week, as well as the past month. There is some (theoretical) question that by asking both questions, the survey estimates for 30 days might be biased.

**Figure 7.4 Per capita consumption in the developing world**

log of consumption per capita per day



PPP = purchasing power parity

Note: When survey consumption data are not available, the standard practice, which is adopted here, is to extrapolate data using data on growth in national accounts consumption means. Official PPP exchange rates are obtained from World Bank, *World Development Indicators*; “consumption” PPP exchange rates are World Bank estimates posted on the bank’s Web site given below.

Sources: Deininger and Squire (1996); World Income Inequality Database, available at [www.wider.unu.edu/wiid](http://www.wider.unu.edu/wiid); Asian Development Bank (2002); *World Development Indicators*, CD-ROM; <http://www.worldbank.org/research/povmonitor/>.

## Should Surveys or National Accounts Be Used? Or Both?

The World Bank’s reason for not adjusting survey means with national accounts means is that the latter are plagued with measurement problems. Which is true. However, the choice of which estimate is finally chosen should be decided according to which method minimizes errors, especially errors in *trends*, because that is an important variable of interest. And it is likely that not adjusting survey means introduces a larger error into the trends than adjusting the survey means by national accounts data. The advantage of using NAS data is that the errors present, and there are many, are systematic in nature; the random component of errors is larger in survey data. And it is the latter that likely dominates any trend estimate, as is most likely what happened with Milanovic’s worsening inequality conclusion for the 5 years 1988 to 1993, and the World Bank estimate of only a marginal poverty decline in the world for 1987 to 1999.

Figure 7.4 shows what has been happening to mean consumption for the past 20 years. Three consumption trends are reported: for national accounts, for surveys with easily available and official PPP exchange rates, and for surveys with recently released (and that also only for one year,

1993) consumption PPP exchange rates.<sup>20</sup> There are two gaps, and both have widened during the past decade. The first gap, between surveys and national accounts, is widely recognized; the second gap, that created by official (and unofficial?) “consumption” PPP exchange rates, has so far not been documented. The reasons, and problems, arising out of the first gap, as extensively discussed above, are many and well known. Little is known about the reasons for or origin of the second gap.

The widening gap or gaps in mean consumption have a mirror image in the finding of more, much more, than the “unobserved” true extent of poverty. Between 1987 and 1999, the gap between the lowest estimate (consumption PPP) and national accounts estimate (official PPP) has widened by about 4 percent. That is not much; it is the level difference that is huge. This difference is about 48 (log) percent. In terms of the head count ratio (\$1.30 poverty line for surveys and \$1.50 poverty line for national accounts), it is a difference between developing-world poverty of 14.2 percent in 1999 (my estimate) versus a head count ratio of 23 percent (official World Bank estimate).<sup>21</sup>

The important point to note is not that national accounts data are better or that survey data are better. Both are extremely useful, and necessary, for most purposes. Further, estimates of distribution can only be provided by household surveys. Sometimes, even mean income estimates are more accurate in survey data, especially when political realities suggest that official consumption deflators may have been “adjusted” (e.g., Sri Lanka during the 1970s).

The burden on analysts is to look at the respective data, before leaping to the conclusions. In an excellent review of methods of measuring poverty, Deaton (2001a) also endorses this use of an all-data approach: “It would seem more logical to use some average of NAS [national accounts system] and survey data to correct the expenditure survey when available, or to make some adjustment to the NAS estimate of the consumption ratio in the case when it is not” (p. 22). Atkinson and Brandolini (1999) also suggest that surveys may be problematic: “There are problems of misreporting (of household data), or of failure to tailor questions asked to the chosen definition. These may, as with tax information, mean that there is need for the adjustment of raw data to exogenous information, such as national accounts” (p. 17).

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20. As is suggested by Chen and Ravallion (2000), local inflation, along with the 1993 conversion factor, is used to compute PPP consumption in 1993 prices for years other than 1993. As was discussed above, even for 1993, the World Bank estimates, at least for India, could not be entirely reproduced. Another problem with the method of using local inflation to obtain “real” PPP consumption is that it assumes that each country remains fixed at its 1993 openness level—clearly a nontenable assumption, especially for the past decade.

21. Note that our estimate is for a poverty line of \$1.50, adjusted national accounts data; the World Bank estimate is for a poverty line of \$1.08, survey data.

However, what is unclear is the method of combining survey and national accounts data; an average may not be representative, or do justice to the relative accuracy (comparative advantage) of each individual source. What happens if one of them—NSS data—is “clearly” in error, an issue explored in great detail in Bhalla (2000b). What happens when one of them—NAS—is clearly in error, as was the case with Sri Lanka (Bhalla and Glewwe 1985). But the spirit of Deaton’s comment is correct: Make maximum and intelligent use of all the data that are available, both from surveys and national accounts.

One objective answer to what should be done is to use national accounts data but to deflate the mean consumption obtained from such data by a factor that accounts for the “problems” contained in the mean NA estimate. This factor can be different for different countries, and could be reviewed by the statistical authorities in the respective countries once every decade or so.

One adjustment suggested by the analysis given here is to deflate such expenditures by approximately 15 percent (or multiplication by the quantity 1.3 divided by 1.5, or 0.867, to be precise). In other words, it is assumed that 15 percent of NA consumption does not accrue to the poor at all. This seems a very reasonable assumption. Once this ratio is estimated, trends in mean consumption can be estimated over time; the distribution of these expenditures is provided by the surveys. This combination (analogous to the practice followed in official poverty estimates in India until the EGGOI report) is likely to yield far more accurate estimates of country and world poverty than are yielded by the current practice of estimating poverty on the basis of household surveys alone.