Standard of Living: SL_{POP}
An Alternative Measure of Nations' Current Material Nell-Being

Robert Summers and Alan Heston

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ABSTRACT

An alternative to per capita Gross Domestic Product, GDP_{POP},has been developed for measuring countries' current material well being. Total Consumption less military expenditures, put on a per capita basis, it is argued, gives a better basis for judging the relative living standards of the nationals of a country than its total per capita output. Estimates of SL_{POP},the new measure, are presented along with GDP_{POP} for many countries and five different years between 1970 and 1989. This alternative standard-of-living index gives a somewhat different view of the economic gap between richer and poorer countries: the gap in current material well-being as measured by SL_{POP} is smaller than the gap in overall economic capacity as measured by GDP_{POP}.

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This note describes a new index of social welfare, denoted SL for "Standard of Living," that has been computed for over a hundred countries around the world. The relative living-standard index covers the two decades from 1970 to 1989 and makes possible direct comparisons of the current material well-being of most of the sizable political subdivisions recognized by the major international organizations.

SL is not to be regarded as an overall social welfare index. Many, many variables enter into overall welfare and SL quantifies only one of them. SL is concerned only with the contribution to social welfare derived from the immediate consumption, both private and public, of goods and services that satisfy immediate utility needs.[1]

In this exposition, Section I deals with the received-doctrine approach to comparing countries' material well-being: comparisons of countries' Gross Domestic Product per capita (GDP_{POP}). Section II describes the Standard of Living measure, SL_{POP}, the direct per capita counterpart of GDP_{POP}. Then Section III presents empirical estimates of GDP_{POP} and SL_{POP} for 112 countries at five year intervals between 1970 and 1989, and shows the systematic differences between the two. The concluding Section IV summarizes the discussion.

I Background

The index most commonly used until now to compare countries' material well-being is their GDP_{POP}'s. GDP measures a country's national output (more specifically, the total value of all its expenditure on the final goods and services produced within its borders[2]); dividing the country's GDP by its population is designed to take account of the magnitude of the needs that the GDP must satisfy.[3] The Penn World Table (see Summers and Heston [1991] for a detailed description of PWT 5, the Mark 5 version) provides estimates of GDP_{POP} for many countries and years based upon a number of different concepts: constant-price indexes of both the Laspyres and chain type, a current-price index, and a hybrid constant-price index that attempts to take account of changes in the terms of trade. These GDP_{POP} numbers meet a significant need of researchers concerned with estimates of levels and growth of production accomplishment and potential. Indeed, the GDP_{POP} numbers are indispensable in assessing a country's development status.

However, GDP_{POP} is an inadequate measure of countries' immediate material well-being, even apart from the general practical and conceptual problems of measuring countries' national outputs. SL_{POP}, a first preliminary refinement of GDP_{POP}, is designed to sharpen our perception of how countries' living standards actually compare; that is, how well in material terms people in different countries live.[4]

Before describing the new SL concept, a last comment may help to set the right perspective. The spirit behind the use of GDP_{POP} is straight-forward: GDP quantifies the set of goods and services used to meet the material well-being needs of a society; the division of GDP by the number of people in the society allows for the magnitude of the society's need for goods and services. In this view, GDP is a numerator looking for a denominator. The strategy underlying the present document is to improve the quality of the numerator by focusing on only the part of GDP that contributes directly to satisfying people's immediate needs.[5]

II Standard of Living: SL

Necessarily, we pass over the not-unjustified criticism of GDP estimates that they don't quantify everything just right. Unfortunately, these criticisms apply equally to SL.[6] However, there are two kinds of overstatement problems inherent in the use of GDP concept in quantifying standards of living, one simple and one subtle.

(1) Current material well-being

In measuring total production, GDP allows for private and public consumption[7] and also takes into account the production of goods meant to help in the production of goods in the future. Investment, without doubt a praiseworthy activity, has its payoffs---quite possibly material well-being payoffs--but the payoffs are realized in the future rather than in the present. For many purposes the potential contribution to material well-being should be noted, but not in valuing current material well-being.

So the numerator of SL includes the private and public consumption components (Consumption plus Government) of GDP, but excludes Investment.[8]

(2) Excluding regrettable necessities (Military Expenditures)

A subtle criticism of GDP is that some of the goods valued in GDP do not really generate intrinsic utility. The mildly protesting term "regrettable necessities" is usually used in this situation. Before taking up the main point here, special treatment of military expenditures, consider an illustration of the regrettable necessity concept. Think of expenditures on locks and keys, goods that have no use except to provide protection from burglars. If the population was perfectly honest and there were no burglars, the protection would not be needed. Suppose in two countries with equal populations and GDP_{POP}'s, complete honesty prevailed in the first but not in the second. Now suppose some resources in the second country, the value of which enters into the measurement of GDP, went into lock-and-key production in order to provide the level of security already enjoyed in the first country. Under these conditions, one might sensibly infer that despite the equal GDP_{POP}'s, the second country has a lower per capita utility---"real" GDP_{POP}--than the first. The GDP's in the SNA do not show this, but common sense suggests this sort of judgment.[9] Observe that the underlying fundamental notion here is that freedom from being victimized by burglars is the "good" that counts---that is, the freedom is the Lancasterian characteristic that counts ---not locks and keys. If such freedom comes without cost in one country but has a cost in another, then either an honesty imputation should be added into the first country's GDP, or a subtraction should be made from the second country's. (Valuing the protection in the second country in terms of the quantity of locks and keys produced is misleading unless the (free)protection actually enjoyed in the first country is also somehow valued.)

If the logic of the last paragraph is at all appealing, why isn't GDP calculated net of regrettable necessities? (Some un-official attempts to do just this are described in Tobin and Nordhaus [19723 and Eisner [1988].) Unfortunately, universal agreement on what really constitutes a regrettable necessity is rare. In most cases it is not clear just which type of expenditures should be labeled regrettable. Locks and keys provide privacy as well as protection from burglary, and some will argue that the contribution to privacy should be valued. How? The principle underlying the calculation of GDP---what people are willing to pay for things is what the things are worth to the society---has the great merit of simplicity and a reduction in the need for special judgments.[10] Strict adherence to the principle helps one

avoid slippery slopes, but it can lead to substantial and systematic distortions in economic judgments.[11]

The regrettable necessity that plays an important role in SL is military expenditures. SL accepts as a given that if a society uses a portion of its resources to produce military goods and services, it is because at the appropriate margin, such goods and services have a greater value to the society than alternative uses of their resources. No judgment is made here, explicit or implicit, about the true value to the society of military goods and services. Subtracting military expenditures from GDP is not motivated by pacifist notions of any kind. The point of the exclusion is very simple: whatever the yeas or nays about military expenditures, the military goods and services they buy are not part of the goods and services SL is meant to quantify. Cannons, bombers, and submarines do not make a direct contribution to current material well-being.[12]

Our resolution of the numerator issue here is an endorsement of SL as defined by [1]:

[1] $SL = C + (G - MilExp)$;

and the counterpart of GDP_{POP} is given in [2]:

[2] $SL_{POP} = \{C + (G - MilExp)\}/POP$.

III Empirical Estimates of Material Well-being

Table 1 presents estimates of GDP_{POP} and SL_{POP} for 112 countries covering the years 1970, 1975, 1980, 1985, and 1989. The values, all from the Penn World Table (Mark 5.6), an update of Mark 5, are all expressed in 1985 international-dollar prices so they are directly comparable across time and across countries. The table is divided into two parts: Part A covers 78 "ever-benchmark" countries that participated in at least one of the benchmark studies of the United Nations International Comparison Programmer and Part B covers 34 countries that have never participated in any of the benchmark studies but about which enough information is available to allow sensible estimates of the values that would have emerged if they had participated in the benchmark study work. The estimates of Part A are certainly more accurate than those of Part B. (A further qualification: the estimates for the four major oil-exporting countries in Part B are subject to wide margins of error.)

The GDP_{POP} columns contain the numbers normally used in making judgments about relative living standards, and the SL_{POP} columns contain the numbers that are claimed here to be superior indicators of current material well-being. The first, most obvious, question to ask is whether shifting to the SL concept makes a difference in one's judgment about countries' conditions.[13] The answer is "Yes." In general, the gap between the living standards of developing and developed countries is distinctly smaller as measured by SL_{POP} than GDP_{POP}. The entries of the SLIV columns in Table 1 show this. STLIV, the ratio of SL_{POP} to GDP_{POP} expressed as a percentage, shows how much, in international dollars, the SL measure is reduced below the GDP number. Focus on the most recent year available, 1989. In that year SLIV for the United States was 74.9. Then the SL_{POP} of any country with an STLIV greater than 74.9 would be closer to the United States SL_{POP} than its GDP_{POP} would be to the United States GDP_{POP}. Using GDP_{POP} as the criterion, classify the 76 ever-benchmark countries of Part A (SL_{POP} values are not available for two of the countries in 1989)into two groups, RICHER (the 20 richest) and POORER (the remaining 56). Forty-six of these latter developing countries had STLIVs that

exceeded 74.9; only 10 had STLIVs below 74.9. (Could an unusually low United States STLIV account for this {82 per cent: 18 per cent) split? No. The simple unweighted average of the STLIVs of all 20 richest countries, 71.5, is even lower!) A transparent way of getting at this quantitatively is to calculate for each of the poor countries (those outside the top twenty) the percentage excess of $SL_{POP,j}/SL_{POP,US}$ over $GDP_{POP,j}/GDP_{POP,US}$. The maximum of such differences is 32.3 and the minimum is -17.0; the unweighted average of the 56 percentages is +12.2.[14] The explanation for this pattern lies in the way the Investment and military expenditure shares of GDP vary with GDP_{POP}. The Investment share significantly exceeds the military expenditure share, and on average richer countries devote a larger proportion of their output to Investment than poorer ones. The gap-narrowing tendency is present in all of the years covered by Table 1. {STLIV, GDP_{POP}} plots are displayed for each of five years. (The observation values are from Table 1; the countries represented in the plots are those that participated in the benchmark study associated with the year.[15]) No econometric analysis is required to see that the points are higher for poor countries than rich, but regression values are given alongside the graphs.

IV Summary

An alternative to per capita Gross Domestic Product has been developed for measuring countries' current material well-being. Total Consumption less military expenditures, put on a per capita basis, it is argued, gives a better basis for judging the relative living standards of the nationals of a country than its total output. Estimates of SL_{POP}, the new measure, are presented along with GDP_{POP} for many countries and five different years between 1970 and 1989.

This alternative standard-of-living index gives a somewhat different view of the economic gap between richer and poorer countries. Compared with the gap in overall economic capacity as measured by GDP_{POP}, the gap in current material well-being is significantly narrowed.

ENDNOTES

1. Many, many indexes have been created that attempt to compare countries' general social welfare. (To cite just one example, see the Human Development Index of the United Nations Development Program [1994].) They all average in one way or another individual welfare indexes covering a number of societal "goods" (usually material well-being somehow valued along with, say, income distribution or literacy or freedom, etc.) to arrive at an overall social welfare ranking. Admirable as the objectives of these efforts are, the fact is that so far none of them yet come close to providing a believable framework for measuring the trade-offs between the various welfare dimensions. (E.g., all other things equal, how does an extra three years of longevity compare with an extra 25 per cent of available goods and services? Any plausible basis for answering this question would have to draw somehow on information about tastes rather than just the variabilities of longevities and national outputs across countries.) We resist the temptation here to enter this cottage industry, and restrict our attention to a way of illuminating only current material well-being.

2. For present purposes, this highly simplified description of GDP is sufficient. Of course, the definitions built into the United Nations System of National Accounts (SNA) contains a great deal of necessary fine detail. In a variety of ways, the SNA estimates inadequately capture the strict utility-generating character of the goods represented by the expenditure data. (Imperfect imputations for non-market goods like housing and other services are examples of this.)

3. India's GDP is much greater than Luxembourg's, but India has a population much, much greater than Luxembourg' s. Given the very substantial difference in the needs of the two countries, the GDP comparison by itself is clearly a misleading basis for comparing the two countries' material well-being.

4. The original motivation for developing a standard-of-living measure was to respond to an inquiry from a prominent economist who called to say "I wonder about your numbers. My wife and I have just returned from a driving trip through Europe and what we saw of how people live doesn't match the PWT (or more generally the ICP) comparisons for the countries." Of course, he was thinking of the GDP per capita numbers. The inquiry implied that the naked eye is an effective tool for international comparisons (a doubtful proposition, to say the least), but it illustrates the importance of making sure answers to questions fit the questions.

5. In a succeeding document, an effort to improve the quality of the denominator will be described. All members of the society do not have equal needs, so a "per equivalent adult" approach is introduced which allows for differences between the consumption needs of adults and children.

6. However, at least in one respect, a special feature of the System of National Accounts is a substantial liability when one attempts to assess standards of living. Failure to maintain a household capital account in the SNA leads to a failure to measure properly the current utilization of household durable goods. (For example, in the SNA, household automobile usage is measured not by (say) the number of miles driven by households times the cost of driving per mile but rather by the value of new automobiles purchased. For some important macroeconomic purposes this is not a short-coming, but it is definitely not the right way to measure the automobile-usage component of current material well-being.

7. Participants in the Hicks-Kuznets debate of the late Thirties would want note taken of the KuzNets view that in fact what government buys with its Government expenditures are really intermediate goods and services. By accepting the notion of public consumption, we are simply taking the side of the winner of that debate.

8. Some readers may find it helpful to be reminded of an important difference between the treatment of government expenditures on final goods and services in the SNA and in the national accounts of the United States. In the latter, all public investment is retained in the Government category, but in the former it is transferred from Government to Investment.

9. The illustration given is only one of many, many possibilities. Perhaps expenditure on heating fuel should be treated as a regrettable necessity when comparing the material well-being of people in a country in the temperate zone with those living in a tropical country. Warm skin may be the appropriate thing to value rather than heating oil, and that comes free (relatively) in the hot country. Another example: Perhaps the extra outlays associated with road-building in mountainous countries should be considered a regrettable necessity when comparing mountainous and flat countries.

10. It should be clear that special judgments are not completely foregone in the SNA. For example, illegal goods are not counted in a country's GDP, and what is illegal is a societal judgment call.

11. Regrettable necessities are likely to be more of a problem in interspatial comparisons than in intertemporal ones. Unless structural change occurs rapidly within a country, the share of its national output devoted to regrettable necessities is likely to change slowly. Therefore, the growth rate of its GDP (the international comparison index)would differ only slightly from the growth rate of its GDP-minus-regrettable-necessities. Such a rationalization is absent in the interspatial case, however. The regrettable-necessity share of a developing country may be quite different from the share of a developed country.

12. Nothing in the social sciences is ever entirely free of ambiguity:

(1) Suppose a very poor, homeless, starving person is recruited into the army. The food and quarters supplied by the army surely should be regarded as a contribution to the person's current material well-being and therefore subtracted from the military expenditure total. However, the absence of the data needed for such an adjustment places this consideration in a familiar category: a problem is acknowledged and then ignored!

(2) Perhaps for some people in a country, military expenditures buys peace of mind. Is this part of current material well-being? A visit to a psychiatrist's couch in quest of peace of mind surely merits inclusion in SL. The more general peace of mind purchased by military expenditures is not what we consider part of the standard of living.

Yes, these are considerations, but---fortunately---such cases don't represent a significant proportion of total military expenditures.

13. The Difference-Cubed Principle provides the basis for the ultimate, minimum judgment about whether the SL innovation is of any value: "A difference that makes no difference is no difference."

14. The differences in the standings of the 56 countries below the richest twenty seems to vary systematically across the continents. The average changes are for Africa, 20.0 per cent; for Asia, 8.0 per cent; for North and Central America, 17.8 per cent; for South America, 8.3 per cent; and for Europe, -3.1 per cent. (Incidentally, averages based on population weights would have displayed an even greater variation. The largest countries of Asia had such low STLIVs that the Asia average would be less than 8.0 per cent.)

15. Strictly speaking, the 1989 plot was not for a benchmark year but rather the last year for which SL_{POP} is presently available. The countries are the participants in the 1990 benchmark study.

REFERENCES

Eisner, Robert [1988] "Extended Accounts for National Income and Product" Journal of Economic Literature December

Nordhaus, William D. and James Tobin [1972] "Is Growth Obsolete?" Economic Growth Colloquium, Volume 5, National Bureau of Economic Research

Summers, Robert and Alan Heston [1991] "The Penn World Table (Mark 5): An Expanded Set of International Comparisons, 1950- 1988," Quarterly Journal of Economics, May 1991

United Nations Development Programme [1994] Human Development Report 1994 New York: Oxford University Press