PER CAPITA INCOME

Estimating
Internationally Comparable Numbers

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International Economics Department

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SUMMARY OF FINDINGS AND RECOMMENDATIONS

1. In 1983, in consultation with an external panel of experts, Bank staff reviewed the methodological issues relevant to the calculation and use of per capita gross national product (GNP) for operational purposes. The report embodying this review was endorsed by the panel (SecM 83-1120, hereafter called the 1983 study) and discussed at a seminar of the Executive Directors on January 5, 1984 (SD84-2). At that time, it was agreed that Bank practice would again be reviewed after five years. This report has been prepared in response to that decision.

2. The 1983 study began, "Per capita GNP figures ... are used by the Bank and others as important inputs into the determination of eligibility for various programs." It acknowledged (paragraph 3) that there had been little discussion about why per capita GNP should serve such a major decision-making purpose, but suggested that "an implicit consensus exists as to what (per capita GNP) does and does not represent." The present report concludes that the available options remain balanced in favor of the methodology adopted after the last seminar. It reviews the underlying issues and proceeds to an explicit discussion of the link between measurement of per capita income and country classification for operational and analytical purposes. It proposes that staff continue work on alternative methods of estimating per capita income converted to a common numéraire, while recognizing that the near-term return on such research may not be great.

Quality of National Data

3. Since the 1983 study, the International Economics Department (IEC, which is used throughout this report to denote both the present department and its predecessor) has increased its activities to identify weaknesses and inconsistencies in country data and to correct them. It systematically reviews country statistics, in cooperation with operational economists, and undertakes some country missions and other technical assistance activities. However, the increase in such activities at best barely compensates for the widespread deterioration of national statistical efforts and institutions that has occurred over the period.

4. The reliability and comparability of national accounts data remain subject to serious limitations. For that reason, **it is proposed that the Bank should continue and, resources permitting, increase its efforts to improve these data.** This will involve continued efforts in IEC, increased priority to basic data issues by the Bank's External Research Support program, and, in country policy dialogues, increased emphasis on the need for improving national accounts (including joint work with UN agencies on resource accounting) and other economic statistics. Meanwhile, for both operational and analytical purposes, **it is proposed that the Bank should continue to use country information on national accounts, complemented and amended in light of other types of Bank staff estimates.**

Measuring Income in a Common Numéraire

5. For reducing numbers to a common base, *the Bank has little choice at present but to use exchange-rate-based measures for international comparisons of per capita GNP and other macroeconomic indicators.* One alternative, reliance on the International Comparison Project (ICP), was extensively discussed in the 1983 study. ICP offers conceptually valid expressions of GNP volumes for different economies at uniform international prices, but is not yet adequate with respect to country coverage or timeliness. It also faces a set of index number problems: *ICP country rankings are dependent on various methodological choices.*

6. All methods of transforming GNP denominated in national currencies to a common basis suffer from a variety of conceptual difficulties. The use of official exchange rates in particular suffers from the problem that exchange rate changes can shift countries' relative incomes in a manner inconsistent with any reasonable view of relative changes in real incomes in these countries. However, use of official exchange rates has clear advantages, notably in terms of country coverage, timeliness, and, (generally) in being relatively unambiguous. **Staff therefore propose to continue using this method while they pursue the development of alternative approaches.**

7. As recommended in the 1983 study, when conditions are egregiously different from those prevailing under free trade, alternative conversion factors are estimated that are deemed to reflect the actual rate at which foreign transactions take place. Such estimates seek to take into

account the nature and restrictiveness of the trading regime, information on relative prices, and the evolution of real exchange rates, etc.. This is a difficult process, in part judgmental, and its use has been kept to a minimum. Since 1984, a substitute conversion factor has been estimated for no more than six countries in any year. From time to time, for several non-member and a few member countries, the official exchange rate has been deemed inappropriate, but for lack of adequate information, no alternative has been estimated. **It is proposed to continue the practice of systematically reviewing and occasionally estimating alternative conversion factors.**

Multi-year Averaging and Denominating in SDRs

8. To smooth the year-by-year fluctuations of the per capita GNP numbers used for both the World Bank *Atlas* and operational purposes, conversion into U.S. dollars has traditionally been by means of a multi-year average of real bilateral exchange rates. A seven-year average was used from 1970 to 1974; a three-year average thereafter. The longer the averaging period, the more it smoothes out year-to-year changes in real exchange rates; by the same token, the longer it takes to reflect changes that have occurred. Ideally, lasting changes should be reflected immediately, and cyclical fluctuations should be ironed out; unfortunately, it is not always possible to distinguish one from the other. As a compromise, **it is proposed to maintain the three-year averaging period, while keeping it under active review.**

9. Some of the fluctuations in exchange rates and the resulting dollar-denominated GNP numbers are due to the fluctuating value of the dollar itself. To mitigate the effects of these fluctuations on operational categories, operational guidelines have been updated by means of a deflator reflecting inflation rates in the G-5 countries and a three-year average dollar-SDR exchange rate, converted back into the U.S. dollar. **We propose to continue with the methods now used, subject to a minor technical change in the way we update the guidelines to be consistent with the method for computing the Atlas per capita GNP.**

A Special Case: The "High-Income" Benchmark

10. While the Bank has a policy for "graduation" from lending, and this policy is periodically reviewed by the Board, it has no formal policy on the classification of countries as "developing" or "industrial."

11. Only one country, Spain, was ever reclassified by the Bank from "developing" to "industrial." This was done on the grounds that its per capita GNP had long exceeded that of Ireland, the country with the lowest income traditionally classified as "industrial." On the same grounds, some oil-producing countries have been listed as "high-income oil exporters." However, the Bank has continued to include in the "middle-income" category several other countries whose incomes have long been higher than those of Spain and Ireland.

12. This has no direct operational implication for the Bank since these countries are no longer Bank borrowers, but it has analytical consequences, and it may have some bearing on trade relationships and financial obligations. Meaningful analysis can only be achieved if the country groups are composed of reasonably homogenous countries. The middle-income group, however, currently includes countries whose debt, trade, and social indicators as well as per capita income differ significantly from the majority of countries in that group; the resulting analysis can therefore be weakened.

13. As discussed with the Executive Directors in 1984, stated in each WDR, and reaffirmed in this paper, per capita income constitutes the Bank's main criterion for classifying countries. The presence of certain high-income countries in the middle-income group is an anomaly, which there is no reason to continue. **In future, it is proposed that the per capita GNP level of $6,000, in 1987 prices, be the benchmark for separating "middle-income" from "high-income" economies. This would lead to classifying as "high-income" economies, in addition to the present group of industrial market economies, Israel, Singapore, and Hong Kong, and to keep in the high-income category, Kuwait, Qatar, Saudi Arabia (subject to confirmation of preliminary estimates for 1987), and the United Arab Emirates. Subject to confirmation of preliminary estimates of 1987 per capita GNP, Libya would be classified as a middle-income economy.** In addition to these income groups, there would remain analytical subdivisions (e.g. highly indebted countries) as well as operational, income-based subdivisions.

14. In general discussions, the term "developing economies" may continue to be used for denoting the set of low and middle-income countries. However, it will be clearly stated (notably in WDR) that the use of the term does not imply either that all the economies belonging to the group are actually in the process of developing, nor that those not in the group have necessarily reached some preferred or final stage of development.

INTRODUCTION

1. A staff report on estimating per capita GNP for operational purposes (SecM83-1120) was discussed at a seminar (SD84-2) of the Executive Directors on January 5, 1984. The discussion referred briefly to the possible use of other indicators of welfare, particularly physical quantities of certain products consumed, and health and similar considerations, but noted that most of the other indicators are qualitative and not amenable to national accounting techniques of the type used to estimate gross national product (GNP), gross domestic product (GDP) and their components.

2. There is little to add to these comments and this report does not attempt to do so. The report does go beyond its predecessor in considering issues on the borderline of traditional national accounting, notably bearing on the sustainability of an estimated income level, including depreciation, depletion, and environmental accounting. The report also discusses in somewhat greater depth issues relating to converting GNP from national currencies to a common numéraire and some uses for per capita income measures, including country classification (without pretending to resolve the issue of what constitutes a developing country). Where possible, details on methodology, technical discussions, and country examples have been relegated to annexes.

METHODOLOGY

3. The Bank compiles internationally comparable per capita income for its own *operational* and *analytical* purposes and for *presentation* to the wider public. To do so, it must first measure income in national currencies, which raises various national accounting issues and the choice among alternative measures of income (detailed in Annex 1). Having measured income, there are additional, if often related, issues in finding a common numéraire. Given the well-known limitations of exchange rates as conversion factors, work continues along the lines of the International Comparison Project (ICP, detailed in Annex 3), and more generally in search of better conversion factors (see Annex 4).

4. The Bank's *operational* purposes relate to decisions about member eligibility for beneficial borrowing terms and other advantages. These purposes turn on the view that poorer countries deserve better conditions from the Bank and thus imply a search for comparative estimates of economic capacity. Standards of living and welfare are relevant concepts. However, even if they were directly measurable, they would not necessarily be the most appropriate for this purpose: countries using their economic output in ways that do not enhance welfare presumably do not deserve more lenient treatment than those that do. The criteria used must be practical. As noted in the 1983 study (paragraph 43):

> "The main consideration is the ordinal ranking of countries. The important point is whether or not one country is more eligible for certain programs than another; it is much less important to determine with precision what exact fraction of one country's per capita GNP is equivalent to the per capita GNP of another."

5. *Analytical* purposes refer to review work and research on developments in member countries and on the efficacy of policies. They include inter-country comparisons and require, at some stage, the conversion of indicators expressed in national currencies into a common numéraire. Analysis also entails the study of a country over time and therefore must recognize, and sometimes exclude, effects of changes in price levels. Because of the

so-called index number problem, it is widely accepted that one cannot establish an unequivocal measure of changes over time in complex aggregates (e.g. national income or price levels). Intercountry comparisons face similar, but less well-known issues. The *index number problem* arises because the weighting pattern for aggregation seldom remains unaltered over time, or between countries.The methodological challenge is to construct standards that are meaningful, well-adapted to specific uses and unbiased, while maintaining awareness of their limitations.

6. For *presentation* of data to the general public and thus to a wider, less-specialized audience, the Bank needs a methodology that is clear and easily understood. It should be emphasized that the Bank is not the only international organization reporting national accounts; in fact, United Nations has formal responsibility in this area.

7. For all purposes, it is most important to achieve broad country coverage and to have current information. There is no obligation to use the same methodology for operational, analytical, and presentational purposes. However, the staff's working premise is that methodological variants should be minimized to avoid confusion among users, and to keep down the costs of compiling and defending similar series.

Measuring Income

8. Although GDP measures production in an economy, and is a core macroeconomic aggregate, the Bank has traditionally used GNP as its basic measure of income for comparing economies. The difference between the two measures is net factor income from (or to) abroad. For instance, the repatriated profits of foreign-owned firms operating in a country, and interest payments on foreign debt, are deducted from GDP to arrive at GNP. For some countries, as explained in Annex 1, the difference between GDP and GNP is significant. As stated in the 1983 study, "Because these flows [net factor incomes] truly constitute resources available to the residents of the countries under consideration, or resources taken away from them, expert opinion holds that they should be taken into account when considering eligibility for certain programs. **It is consequently proposed to continue to base the Bank's operational decisions on per capita GNP."**

9. While GNP is a broad measure, it is not an all-encompassing one. Per capita GNP does not, by itself, constitute or measure welfare or success in development. For most analytical purposes, it needs to be complemented by other considerations and indicators. However, it remains the best single indicator of economic capacity and progress. Gross national income (GNY), and net national product (NNP) are additional measures of a country's income that serve specific purposes and are discussed in Annex 1.

10. Certain concepts must be particularly stressed. Only goods and services *produced* are counted in GNP. Production requires human intervention. Mushrooms and orchids that grow wild in the forest and the natural increase in the wild elephant herds do not count; but when they are picked or hunted for sale, or even for consumption, their total value is attributed to the picker and hunter.

11. No distinction is made between the aims and ultimate uses of the product according to whether or not they merely offset some natural or other obstacles, or harm, or indeed whether or not they contribute to welfare. For example, *other things being equal*, GNP is higher in cold countries, with expenditures on heating and warm clothes to keep people from freezing, than in balmy climates where people are comfortable wearing light clothes in the open air. GNP is higher if people commute by train over long distances than if they live near their workplaces; GNP is higher in countries with larger police forces than Utopia.

12. Furthermore, GNP is *gross*: no deduction is made for the wear and tear of physical capital. Conceptually, *net* national product (NNP) reflects this adjustment, but data on it are particularly patchy and unreliable. Nor does GNP (or even NNP) reflect the evolution of natural resources. No correction is made for pollution or the depletion of mineral sources. Such adjustments present conceptual and practical difficulties, such as assigning a "value" to cancer-causing pollution, accounting for resource discoveries, assigning proper economic values to resources which markets do not yet perceive as "scarce," allocating costs which are essentially *global* to a *national* accounting framework.

13. Yet there is a growing recognition that a quantitative framework is urgently needed for a better understanding of these issues. Expert opinion seems to be moving towards the elaboration of satellite accounts (see Annex 2).

14. Satellite accounts would, to a large extent, take care of important issues like so-called "defensive expenditures." These are costs incurred to protect the environment and to combat, either privately or at a collective, public level, those undesirable aspects of economic activity that lead to environmental decay, resource degradation and depletion, and pollution. At present, when defensive expenditures are incurred privately, they are treated as other costs and they are not normally part of GNP. The contribution to GNP of, say, a steel plant is equal to the value of the

steel produced minus all costs incurred, whether to buy iron ore or to abate pollution. However, when pollution abatement or environment protection is incurred publicly, it is deemed to contribute to GNP without any corresponding deduction having been made necessarily elsewhere.

15. Satellite accounts can reveal more clearly how the exploitation, production, and sale of scarce subsoil and other non-renewable natural resources impinge on the broader, longer-term viability of an economy. The overall surpluses and distributable financial rewards determined by corporate accounting methods, which are officially incorporated into the subsequent statistical assessment of output, value added, and income in the national accounting context, may impart a false sense of security to countries involved in the production of exhaustible natural resources. Likewise, the discovery of new natural resources may have to be reflected as a positive improvement in a country's economic status and potential.

Purposes

16. Apart from its general analytical significance, per capita GNP is used to gauge country eligibility for international preferences. The Bank uses per capita GNP as a guideline for granting preferences for domestic civil works contractors and for various borrowing terms (see Box A5.1.). The United Nations Development Program (UNDP) relates eligibility for assistance to per capita GNP levels and assesses contributions on this basis. Certain industrial countries refer to per capita GNP to determine eligibility for preferential trade treatment, or for the distribution of aid programs. Per capita GNP is also a broad criterion for distinguishing rich and poor countries.

Limitations

17. Beyond the inherent limitations of national accounting concepts, two main issues arise in intercountry comparisons of GNP:

i. the accounting concepts and practices used by countries for compiling national accounts may diverge more or less from each other (and from *SNA* rules). This is obvious for countries that use the *Material Product System (MPS)* rather than the *SNA*, to compile national accounts; but more or less important divergences from standard practice exist in most other countries.

ii. National accounts of countries are compiled in a variety of currency units. To compare or aggregate them, they must be converted into a single unit of account, and this presents certain theoretical and practical difficulties.

Reliability, Comparability, and Improvements of Basic Statistics

18. The 1983 study and subsequent Board seminar stressed the importance of strengthening the basic statistical and national accounting capabilities in member countries. There was broad agreement that the Bank should cautiously proceed in activities aimed at improving statistical capabilities at national level. The 1983 study proposed that systematic review, evaluation, and adjustment of national accounts and conversion factors should be done within the overall framework of country economic work and policy dialogue. It recognized that, in the long term, improvement depended on concerted efforts at the national level, with technical assistance from international agencies. In order to further these objectives, it was proposed that the Bank should strengthen cooperation with national and regional agencies and should participate in the Inter-secretariat Group on the Revision of the *SNA*.

19. In recent years, Bank staff efforts to obtain improved and more comparable GNP data have focussed on the basic statistics themselves, and on achieving much closer cooperation and coordination of activities with other international agencies, particularly the IMF and UN regional offices. While substantial, these efforts have been limited by the paucity of the resources that could be devoted to such activities. The Bank does not maintain a large, central statistical staff; there are two dozen staff members in IEC's Socio-Economic Data Division (in contrast to about a hundred in the Fund's Bureau of Statistics, for example) and their responsibilities include a variety of analytical and operational support functions beyond those of purely statistical units.

20. In terms of the basic national statistics, there is reason to believe that the modest increase in Bank staff efforts to review and improve them has not even been sufficient to counteract the widespread deterioration of basic statistical systems in developing countries. The staff effort itself has essentially taken the form of strengthened and systematic cooperation between IEC and country economists. In addition, limited technical assistance to national statistical authorities through missions of IEC staff have helped to deal with specific statistical issues. Annex 1 contains further information on technical assistance and adjustments to national accounts.

21. Given that data are weak in many countries, conclusions based on them should be formed carefully, particularly when they are highly sensitive to minor variations. Country economists and other operational staff should give adequate priority to statistical improvements, and view data with healthy scepticism. However, lively consciousness of the weaknesses of data should not be

allowed to degenerate into nihilism. The procedures applied by Bank staff, including in-house reviews and occasional field missions and technical assistance, constitute a useful complement to national efforts, and at least indicate the order of magnitude of the major aggregates, and the direction of changes, yielding a broadly usable set of data for most countries. Only in a small number of cases, when the data are deemed to be particularly difficult to interpret or unreliable, has it been decided not to include them in Bank documents.

22. In view of the weakness in countries' GNP data, **it is proposed that the Bank should provide additional technical assistance** within the constraints of budgetary resources. Among the most urgently needed activities is an evaluation of the impact of certain accounting procedures on growth estimates, particularly in economies where price controls are or have been dominant. There is reason to believe that in such economies national accounts may overstate growth rates in constant prices by understating price increases.

Finding a Common Numéraire

23. In practice, both in the Bank and elsewhere, most international comparisons are based on indicators converted at official exchange rates. However convenient, such conversions are known to suffer from serious limitations. As stated in the 1983 study:

> "The Bank's past practice has been to convert national data into a common numéraire (almost always the US dollar) by applying to them a conversion factor which generally has been the official exchange rate or some multi-year average or other variant of it. The use of this particular conversion factor has not seemed to require justification. It was there, and it has long been used to convert one country's prices into another's. Nevertheless, the official exchange rate has usually been viewed, at least implicitly, as a convenient approximation to some other conversion factor, and there have always been cases where it was sensed that its use was, in some sense, wrong...
>
> "In fact, there are strong reasons for considering that converting national currency GNP data at the official exchange rates assures only imperfect comparability. This would be so even if this rate was uniformly applied to all foreign transactions (exports and imports). The domestic prices of goods and services actually traded internationally would then be exactly equal to their foreign prices multiplied by the exchange rate (abstracting from transport costs). However, the prices of similar tradeable goods could be very different because of imperfections of the domestic market. As for the prices of nontradeable goods and services, they would bear little relationship to foreign prices. In brief, the volume of goods and services that can be purchased for a dollar in one country does not necessarily bear a close relationship to the volume of goods and services that can be purchased for a dollar in another country, even if there are no tariffs, quantitative restrictions nor transport costs.
>
> "Such ideal conditions never actually prevail. One relatively minor issue concerns *fluctuations*. While exchange rate fluctuations have attracted most attention in the 1970s, since the devaluation of the US dollar and the official end of the so-called fixed parity system, there was much instability even before then. Real exchange rate relationships are the relationship of nominal exchange rates, deflated by the relationship of domestic prices. Precisely because they were fixed, nominal exchange rates did not move in exact parallel with domestic price movements. Thus, even if one had known that the relationship of income "volumes" indicated by a particular period's exchange rates was "right" in some sense, or at least constituted a useful reference, that relationship would no longer necessarily prevail in the following year, if the exchange rate remained constant and price movements were not exactly identical. Then, from time to time, these relationship might return towards their original parity, or beyond, through the reverse movement as a devaluation abruptly lowered one country's prices calculated in foreign currency at the official exchange rate. With the advent of floating exchange rates, which some had expected to stabilize real price parity relationships, in fact even more frequent and wide, although less abrupt, fluctuations occurred.
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> "Fluctuations apart, even for traded goods domestic prices are not equal to their export or import prices, converted at the official exchange rate. This is because transport costs, tariffs and subsidies intervene; quantitative restrictions affect their trade and their final prices. In some cases, extreme but not necessarily very rare, the official exchange rate can bear very little relationship to the rate at which transactions actually take place. A uniform set of taxes and subsidies may be imposed on practically all foreign transactions, as in the early 1970s in Sri Lanka: exports may be subsidized by the granting of "import entitlements," and imports subject to their surrender, as in the 1960s in Pakistan; or practically all trade and service transactions may take place at prices quite unrelated to the domestic price level, and apparently with little if any reference to it, as in the Soviet Union."

24. The 1983 study had argued that, ideally, volumes of goods and services, aggregated at a common set of prices or purchasing power parities (PPP) are the legitimate basis of intercountry comparisons. The International Comparison Project (ICP) and related research, to which the Bank had contributed over $2 million during 1975-1985 (ICP was by far the biggest single user of Bank research funds), is the only source of such estimates, provided through five-yearly benchmark exercises. However, in 1983 the latest ICP benchmark was for 1975 and covered only a handful of the Bank's developing member countries. Furthermore, ICP still presented some unresolved methodological issues. The 1983 study proposed use of ICP when Phase IV (1980) of the ICP was completed, provided that:

- important methodological issues have been satisfactorily resolved;
- countries grouped by income levels can be compared in terms of price weights characteristic of them, and then each group can be appropriately linked to others;
- a set of guidelines appropriate to the scale of GNPs converted by PPPs can be prepared, and be comparable in its operational impact to the guidelines corresponding to exchange-rate converted GNPs, which will have to continue to be applied simultaneously to the countries for which PPP information is not yet available.
- PPP converted GNP numbers can be updated annually; and a satisfactory solution has been found for the application of the guidelines when the PPP-converted information and the exchange-rate converted information give different results.

One additional implicit consideration was that the country coverage of ICP should continue to expand after Phase IV.

25. During the 1984 Board seminar, it became clear that the majority of Executive Directors encouraged further examination of the theoretical issues related to the use of the ICP-based methods. However, they also insisted on the need for further Board discussions and clearance before ICP-based methods were introduced, even partially, in the criteria for operational decisions; no Executive Director objected to this emphasis on the need for a cautious approach. Pending resolution of these issues, staff were to continue using conversion methods based on the exchange rate for all countries. Systematic efforts were to be made by staff to reduce or eliminate certain anomalies associated with the use of exchange-rate-based conversion methods.

International Comparison Project

26. Although ICP information has become available in a somewhat more timely manner and progress has been made on some of the above points, developments related to the ICP itself reduced or, at best, delayed the possibility of introducing ICP-based methods. They relate to coverage of ICP and to a variety of methodological issues. The most important of these relate to consistency over time of ICP data and dependency of ICP-based rankings on methodological choices, including the choice of the base year and the process of aggregation.

27. Phase III of the ICP, for 1975, covered 34 countries, of which half were developing countries. In Phase IV, for 1980, coverage grew to 60, including 39 developing countries (15 in Africa, 8 in Asia, and 16 in Latin America). Phase V (1985), now nearing completion, has seen major changes. Coverage increased in Africa and the Caribbean. The United States resumed full participation, joining the majority of OECD countries including all members of the European Communities. However, Latin America is now entirely absent. Lack of ICP data for a major region, whose relations with the World Bank have important operational implications, renders the present coverage of ICP inadequate for most operational and broadly international comparative uses. It does not, however, detract from its usefulness for intra-regional and limited inter-regional comparisons.

28. Staff have studied methods for operationally linking ICP data for a limited number of countries to exchange-rate converted data available for others, into a single set of ordinally ranked per capita GNPs. Research into econometric formulas relating purchasing power parities to per capita income levels through existing exchange rates (so-called "shortcut estimates") are based on a presumed constant relationship between these variables. As successive rounds of ICP showed changes in this relationship and suggested less close determination, research into shortcut estimates has lost much of its earlier appeal.

29. Research continued to be pursued by Bank staff into reduced information estimates. These are methods allowing the estimation of the full range of GNP components in terms of ICP methodology, but on the basis of a much more limited, and therefore much cheaper, sample of price data. Unfortunately, budgetary constraints and inability to obtain additional financing, notably from the Bank's external research support funds, also brought this work to a halt, at least for the time being.

30. Furthermore, ICP work in Phases IV and V highlighted methodological issues, discussed more extensively in Annex 3. These are not unique to ICP. They, or their

variants, are common to all comparisons of complex aggregates; they are inherently *index number problems:* that is, problems that arise when an attempt is made to compare complex aggregates using a single number. In brief, conceptual and other changes from one round to the next have caused substantial instability in the per capita income relationships established by successive ICPs. Furthermore, even within a given round of ICP, direct bilateral comparisons of two countries cannot be made to yield the same result as (and sometimes may yield quite different results from) indirect comparison of the ratio of their relationships to a third country or to a country group. More broadly, methodological choices have a strong bearing on the value, and even the rank order, of intercountry ICP comparisons.

31. ICP findings shed valuable light on the comparative structures of economies, including both the relationship of prices in various economies and the volumes of goods and services allocated to certain uses (e.g. personal and government consumption, business investment...) or comprised in certain categories (food, medical expenses, housing, etc.). Staff will pursue the study of these dimensions of ICP in order to ensure familiarity within the Bank of the results.

32. The dependency of ICP results on methodological choices is inherently related to its advantages, i.e. to its goal of comparing *volumes* of national expenditures. But since international comparisons of GNP must necessarily use a common numéraire, *some* method has to be used to convert values (typically in different currencies) into volumes. At present, exchange-rate-based conversion factors are most practical.

Official Exchange Rates

33. IEC has expanded its collection and analysis of various exchange rates. It has improved conversion methods, notably by creating average conversion factors from officially recognized multiple exchange rates where appropriate. It has also clarified procedures to flag exchange rates that seem to differ greatly from rates effectively used in exports, imports, and other foreign transactions (the *effective transactions rates*). IEC now collects but does not publish parallel (black or free) market rates. These do not provide a direct indication of the appropriate exchange rate, but in conjunction with ICP and other indicators they shed useful light on conversion issues and set outer limits on any possible adjustment of conversion factors.

34. *Review and Adjustment.* Exchange rates that differ markedly from rates actually used in foreign transactions are identified through Fund reports on trade and exchange restrictions, and findings of country economists. The evolution of the effective real exchange rate is also systematically examined. A sharp increase in this rate often indicates an apparent overvaluation compensated by severe import controls (and perhaps export subsidies). These create a gap between the official exchange rate and the rate effectively paid and received in international trade.

35. *Estimating Alternative Conversion Factors.* The Bank rarely uses such alternative conversion factors. This is partly because they are difficult to estimate, and for operational purposes it has been thought best to minimize the opportunities for arbitrary decisions. It has been Bank practice to tolerate departures from free trade conditions over a wide range. This conforms to the letter and spirit of the 1983 study, which indicated that such alternative conversion factors would be used only in "*egregious*" cases, i.e., **in cases that depart from common practice by an exceptionally large measure.**

36. Only for about a half dozen countries were estimated conversion factors (as opposed to official and authorized exchange rates including authorized multiple exchange rates), used for GNP per capita calculations in the operational guidelines and the *Atlas* in each of the past five years (see Box A4.1). These countries had been subject to thorough review, which suggested that trade and exchange restrictions were particularly severe, and the difference between official exchange rate and effective transactions rate was exceptionally large during the specified period. Usually, this problem was also signalled by a sharp appreciation in real terms of the officiall exchange rate.

37. While an effective transactions rate cannot be measured precisely, it may be approximated with the help of information on trade restrictions and effective protection rates. When such information is inadequate for forming an estimate, a less satisfactory alternative procedure is used, but one that is nevertheless preferable to a highly distorted official exchange rate. A past year is identified where "normal" conditions were thought to prevail and the exchange rate of that year adjusted for the changes in the country's domestic absorption deflator (relative to that of the US) during the period. The resulting figure yields a conversion factor equal to the real exchange rate of the chosen base period. Even this, though, is not an unequivocal concept. Other reference countries and other price indices might be equally reasonable.

38. There are limitations to this method. The choice of the base period is necessarily judgmental, as it is difficult to assess the impact of existing trade restrictions that are not well documented. Moreover, even under free trade conditions real exchange rates can change, sometimes

substantially. To take one example, a fall in the price of a major export crop would both lower the domestic price deflator and tend to depress the exchange rate (since the value of exports has fallen). Increased debt service, coming after years of heavy resource inflows, may have similar effects. In some countries, where black markets develop, the appreciation of the real exchange rate may be understated by the official price indices, while the increase in the nominal value of GNP may be similarly understated.

39. It is important to take such circumstances into account when choosing the base year or adjusting the derived conversion factor for them. The judgments involved are difficult and their correctness cannot be verified. However, as has happened in several cases, when subsequently the countries concerned have undertaken major adjustment programs involving trade liberalization and devaluation, post-devaluation exchange rates have often been within a reasonable range of the substitute conversion factors estimated earlier, thus providing some *ex-post* support to staff judgment.

40. Following sharp devaluations accompanied by a relaxation of trade restrictions, the resulting exchange rate could be extrapolated backward (in real terms) to derive historical conversion factors. However, the real rate that prevails immediately after the nominal devaluation may be lower than the average rate of any representative period, if the nominal devaluation also aimed at partly compensating for anticipated subsequent inflation. Consequently, the real exchange rate chosen as the base must either be the average for a relatively long period, or the rate for a given period corrected for effects of estimated or projected future inflation. It is largely for this reason that staff rarely use recent exchange rates to re-estimate past conversion factors.

41. As mentioned before, estimates of effective transactions rates are difficult, hazardous, and to some extent arbitrary. All that can be said for them is that they are preferable to the use of grossly unrepresentative official exchange rates. Hence, staff are committed to making and using such estimates only when distortions of the official exchange rate are truly egregious.

42. When GNP or GDP is computed by a country's national accountants, the price actually paid for traded goods determines the values attributed to specific sectors. The price thus influences the values of major aggregates like consumption, investment, as well as imports and exports. Its value in domestic currency partly depends on the exchange rate. Converting GNP back into dollars at another exchange rate would therefore give somewhat misleading results.

43. In cases when an alternative conversion factor is estimated, this, by definition, diverges markedly from the official exchange rate. To obtain reasonably meaningful values for per capita GNP where trade-related components reflect the official exchange rate, it is necessary to return to the original national accounts, and adjust them appropriately.

44. When an alternative conversion factor, not based on the official exchange rate, is used for converting the *per capita* GNP, a related single-year conversion factor is also used for converting *overall* GNP and GDP and their components for various analytical purposes. Naturally, the types of adjustments to the national accounts that were described above then also apply.

45. While these procedures are necessarily somewhat oversimplified, for analytical purposes the resulting aggregates are more reasonable than those obtained with use of highly distorted official exchange rates. In particular, one avoids overstating the weight of countries with grossly overvalued exchange rates in respect to global comparisons. Moreover, certain internal relationships to GDP like those of trade and resource inflows, debt, the current account balance, and, if foreign aid contributes significantly to the budget, sometimes even the fiscal deficit tend to be similarly underestimated in the national accounts of countries with grossly overvalued exchange rates. Even simple corrections in these cases yield indicators that are more useful analytically.

46. *Smoothing Fluctuations in Conversion Factors with SDR Rates.* The variability of exchange rates has been particularly great in recent years. Conceptually, variability can be separated into two components: variability of one economy's "real" exchange rate relative to those of its trading partners, or to some other global composite; and variability of the numéraire, (which, for international comparisons, is usually the US dollar). If one conveniently defined the latter as the variability of the US dollar/SDR exchange rate, it could easily be attenuated by adopting the SDR as numéraire. Indeed, to shield operational decisions from fluctuations in the dollar numéraire, operational guidelines are now based on an SDR deflator, merely translated into dollars at the prevailing exchange rate. As the dollar-SDR exchange rate has fluctuated over the years, these movements have been paralleled by those of the dollar values of the operational guidelines, and of per capita GNPs of developing countries. Hence, the relationship of GNP per capita to the operational guidelines has not been affected, although the entire structure has appeared quite variable.

47. *Exchange Rate Averaging.* Like the United States, individual countries allow the real value of their currencies to move relative to the real value of the currencies of their trading partners. The official nominal exchange rate sometimes fluctuates from day to day; sometimes it is subject to major realignment as the real exchange rate gets gradually out of line; and sometimes relative price changes are partially compensated by a gradual divergence between the official rate and the rate actually used for foreign transactions, brought about by the growing use of quantitative restrictions or taxes and subsidies. To attenuate these fluctuations, the Bank uses a three-year moving average of real exchange rates for converting per capita GNPs from national currencies into dollars.

48. Arguments can be made in favor of averaging rates over periods longer or shorter than the three years used for the *Atlas* and operational guidelines. Changes in real exchange rates sometimes reflect new realities, (e.g. when countries devalue their currencies in the face of sharply deteriorating terms of trade; or after 1985, when the dollar declined sharply). Any multi-year averaging in the face of such movements merely delays the recognition of a lasting reality. Ideally, one would wish to reflect immediately permanent changes, and to smooth out cyclical fluctuations. But it is difficult to distinguish *a priori* between lasting and temporary exchange rate changes.

49. The seven-year moving average used by the Bank to calculate per capita GNPs for the World Bank *Atlas* before 1974 resulted in considerable smoothing. Indeed, the Bank changed its method from a seven to a three-year moving average because the seven year averaging was thought in the early 1970s to attenuate exchange rate movements excessively. It was then thought that the movements following the 1973-1974 increase in oil prices constituted a permanent readjustment of exchange rates, whose introduction into the GNP calculations should not be unduly delayed.

50. On balance, three-year averaging seems, for *operational purposes*, a reasonable compromise of various considerations. Greater stability brought about by longer periods of averaging may not be desirable by itself. Moreover, if, through the use of a very long period for averaging, the moving average, which only applies to *per capita GNP* numbers, as published by the Bank (in the *Atlas*, etc.) and used in operational guidelines, were to be very different from the annual exchange rate, problems similar to those discussed in paragraphs 38-40 would arise. **It is therefore proposed to continue the present practice of three-year averaging.** However, this issue needs to be kept under review.

51. In summary, **it is proposed to keep using as reference for operational guidelines the last available annual per capita GNP normally converted at the past three year's average official exchange rate, adjusted annually by the movements of the GNP deflator relative to that of the US.** Staff will continue to estimate alternative conversion factors when the rate actually applied to foreign transactions diverges from the official rate egregiously. Such cases of truly exceptionally large divergence are unlikely to much exceed half a dozen cases in any year. For analytical purposes, as mentioned in paragraphs 40 and 41, staff will continue to convert national account aggregates at the applicable *annual* conversion factor.

52. This discussion highlights some of the considerable technical, practical, and theoretical difficulties of comparisons and aggregations based on the conversion of national accounting aggregates into a single numéraire. Staff will continue to make pragmatic methodological improvements, and also to investigate the theoretical possibilities for devising better comparison and aggregation methods. These investigations will include continued close involvement with the International Comparison Project, but will not be limited to it.

COUNTRY CLASSIFICATION

Adjusting Operational Guidelines

53. The Bank has established "thresholds" of per capita GNP categories to determine borrowing countries' eligibilities for various Bank loan programs. They are: eligibility for (a) special preferences granted to domestic civil works contractors, (b) IDA credits, (c) IBRD loans with maturities longer than 17 years, (d) IBRD loans for 15 years, and (e) graduation from IBRD. The original thresholds for IDA eligibility and IBRD graduation were

Box 1: SDR Deflator in US Dollar Terms - Present and Proposed Formulas

CODES	BASIC DATA FOR COMPUTATIONS	1980	1981	1982	1983	1984	1985	1986	1987
(A)	SDR deflator in SDR terms (1970=100)	209.4	229.4	244.4	253.7	263.3	271.4	286.5	294.1
(B)	SDR deflator in SDRs, 3-yr average 1/	..	..	227.7	242.5	253.8	262.8	273.7	284.0
(C)	US GNP deflator(1980=1), annual	1.000	1.079	1.148	1.185	1.232	1.272	1.306	1.345
(D)	US GNP deflator, 3-yr weighted average 2/	..	..	1.076	1.137	1.190	1.231	1.271	1.308
(E)	$/SDR rate	1.3015	1.1792	1.1040	1.0690	1.0250	1.0153	1.1732	1.2931
(F)	$/SDR, 3-yr average 1/	..	..	1.1949	1.1174	1.0660	1.0364	1.0712	1.1605
(G)	Relative inflation adjusted average $/SDR rate 3/	..	..	1.187	1.113	1.065	1.038	1.053	1.154

FORMULAS	COMPUTATION RESULTS	1980	1981	1982	1983	1984	1985	1986	1987
(BxFxC ÷D)	SDR deflator in US $ (Present method) 4/	..	..	290.3	282.3	280.2	281.4	301.3	338.8
(AxG)	SDR deflator in US $ (Proposed method) 5/	..	..	290.1	282.3	280.5	281.8	301.7	339.3

NOTE: 1/ Simple arithmetic average for the target year and two preceding years.

2/ Arithmetic average weighted by real US GNPs for the target year and two preceding years; computed as ratio of the sum of nominal US GNPs to the sum of real US GNPs for the three years.

3/ Simple arithmetic average of the target year's $/SDR exchange rate and the two preceding years' exchange rates that are adjusted for differences between US inflation and the average inflation for the SDR basket countries. More specifically, this average $/SDR rate for year t is computed as:

$$\left[E(t-2) \cdot \left\{\frac{P\$(t)}{P\$(t-2)} \div \frac{Psdr(t)}{Psdr(t-2)}\right\} + E(t-1) \cdot \left\{\frac{P\$(t)}{P\$(t-1)} \div \frac{Psdr(t)}{Psdr(t-1)}\right\} + E(t)\right] \div 3,$$

where E(t) = $/SDR exchange rate for year t, P$(t) = US GNP deflator for t and Psdr(t)=SDR deflator in SDRs for t.

4/ The computation procedure is: the 3-year average SDR deflator is first converted to US dollar terms via the 3-year average $/SDR exchange rate and then inflated to the target year price level via US inflation rate; designed to be consistent with the previous Atlas method for computing GNP per capita. For example, the SDR deflator in US$terms for 1982 is: 290.3 = 227.7 x 1.1949 x 1.148 ÷ 1.076.

5/ The computation procedure is: the SDR deflator in SDR terms for the target year is directly converted to US dollar terms via the relative inflation adjusted, average $/SDR exchange rate for the target year; designed to be methodologically consistent with the present Atlas method for computing GNP per capita. For example, the SDR deflator in US$ terms for 1982 is: 290.1 = 244.4 x 1.187.

set in 1970 prices. The threshold for civil works preference was set in 1971 prices, and that for "longer-term" IBRD loans, in 1972 prices.

54. The Bank regularly updates the original threshold of per capita GNP categories to reflect the applicable international inflation rate. Until 1984, the thresholds were updated by the US inflation rate only, i.e. kept constant in terms of base year US price levels. In 1984, the Board approved the use of an SDR deflator for this purpose. The original thresholds are now updated via an SDR deflator which is based on the average inflation rates of the five countries whose currencies make up the SDR, weighted by their currency compositions in the SDR basket and converted into US dollar terms. It is proposed to keep this method, although with a slight technical change to be consistent with the present *Atlas* method for computing per capita GNP (see Box 1).

55. As noted earlier, despite its limitations, per capita GNP is the best single indicator of countries' eligibility for various financial terms from the World Bank Group. However, it is rarely used alone. Economic performance and creditworthiness are key considerations in determining IDA-eligibility; the IBRD graduation benchmark is only a threshold for starting a process, and the actual graduation is determined by other considerations. Even graduation from IDA is not truly automatic, as the benchmark does not constitute an entitlement; many countries below the IDA graduation benchmark do not now receive IDA credits, and several others borrow both from the Bank and IDA. Thus graduation from IDA on the grounds of rising per capita income tends to be a gradual process.

56. Nevertheless, present Bank policy is to use per capita income as the sole determinant of eligibility for granting preferences to domestic suppliers of civil works financed by Bank group lending. The same benchmark is used, by design, as the dividing line between low-income and middle-income countries. See Box A5.1. Eligibility for softer IBRD terms is also determined by per capita GNP alone.

57. Income categories also constitute analytically useful distinctions. The *World Development Report* states (page xi of the 1988 edition) that, "The overall classification uses GNP per capita as the main criterion." The value of such categories is reduced if the dividing line does not follow logical transparent criteria, or if the categories are unduly unstable. As discussed earlier, the three-year averaging of the exchange rates used for calculating per capita GNP aims at reducing one cause of instability.

The Need for Reasonably Stable Categories

58. Nevertheless, the simple application of the income criterion has occasionally moved countries from one category to the other, and then back again. Since the FY83 operational guidelines, 44 countries have changed lending terms categories. Of these, 15 have subsequently moved back into their previous category at least once. (See Box A5.2 for country specific changes in lending categories for FY89, Operational Guidelines.) It would completely defeat the purpose of any operational benchmarking if countries could not move from one category to another, and it is an unfortunate fact of the 1980s that many developing countries have suffered a reversal of previous income gains. Nevertheless, it would be desirable to minimize disorderly movements back and forth between categories, if reasonably objective means could be devised for doing so.

59. Such movements may occur for a number of reasons. The most undesirable probably relates to fluctuations in real exchange rates. If a country pegs its nominal exchange rate, and devalues it from time to time, its real exchange rate would crawl up and then fall abruptly at each devaluation. If this is done within a trade and exchange system of just normal restrictiveness, the official exchange rate would be used for the *Atlas*-style conversions. If the devaluation cycle is markedly longer than the three years used for the moving average, the moving average real exchange rate could also be fluctuating sharply. A country would be pushed down to a lower category as its last devaluation gets fully incorporated into the three-year moving average, and then move back up into the higher category as its exchange rate gradually appreciates in real terms under the impact of its domestic inflation. A similar cycle has also characterized countries whose currencies are linked either to the U.S. dollar or to European currencies: their real exchange rates fluctuate relative to the "real" SDR, used to calculate the guidelines.

60. Another cause might relate to temporary terms of trade changes. If a country's major product and dominant export is a primary commodity, say coffee, a rise in the international coffee price will raise the country's GNP: the price level of domestic production will inkrease, and as export earnings rise, there will be upward pressure on the exchange rate. The same phenomenon in reverse would tend to reduce the GNP when coffee prices fall. Fluctuations may also be due to a temporary change in national production, due (for instance) to an exceptionally high (or low) harvest, or sometimes even to construction on a major foreign-financed investment project.

61. In principle, one could separate the issues of country classifications from those regarding operational decisions. For instance, it may be decided that certain operational decisions take effect only after a country has belonged to a specific category for a certain length of time. However, the analytical uses of country classifications are also important, and would also be disturbed by frequent back and forth changes.

High-Income Countries: A Special Case

62. The World Development Indicators (WDI) traditionally lists countries in order of increasing per capita income (see Box A5.3 for a list based on information currently available).The countries are grouped according to income level: low-income, middle-income, and high-income. However, there has long been an overlap between the per capita incomes of the highest, so-called upper middle-income economies, and the lowest, so-called industrial market economies. Furthermore, certain oil exporting countries have been separated on the grounds of their high-income levels, but also listed separately from the industrial country group, rather than in order of ascending incomes.

63. The only country ever reclassified by the Bank from the "developing" to the "industrial" category is Spain, in 1982. This issue was discursed in the Board at the time, in the context of operational criteria. Staff justified the proposed reclassification by noting that Spain's per capita GNP had by then for many years equalled or exceeded the per capita GNP of Ireland, a country traditionally classified as belonging to the "industrial" country group. Subsequently, though Ireland's per capita GNP has risen marginally above Spain's, this has not prompted any new proposal to reclassify Spain as a developing country.

64. For the past few years, three other economies classified in the middle income group have had higher per capita GNP than Spain (1987, $6,010) and Ireland (1987, $6,030); Hong Kong since 1976 (1987, $8,260), Singapore since 1976 (1987, $7,940), and Israel since 1983 (1987, $6,810).

65. Another group of countries once classified as "developing" has been separately listed in recent years, that of the "high-income oil exporting countries." These have had income levels markedly higher than those of Spain and Ireland for some years. They were separated from both developing and industrial countries in analytical presentations.

66. To be useful for analytical purposes, country categories should be reasonably homogeneous from the point of view of the main criteria. Including among the upper middle-income countries a few economies with much higher income levels than most other members of the group, and even exceeding some members of the higher income group, reduces the value of group indicators. More broadly, given the Bank's general practice of grouping countries into categories based on per capita incomes, it makes little sense to maintain a category that has a floor but no ceiling, and that includes the widest—and potentially unbounded—array of per capita income levels. Israel, Hong Kong, and Singapore account for two percent of population, six percent of GNP, and about a quarter of the trade of their present group. Each has a well-developed financial system and an international investment position very different from those of most middle-income countries. By their social indicators, too, they are comparable to other high-income countries.

67. Whether a country is classified as "high-income," or "middle income" has no operational implications for the Bank itself. Bank graduation starts well before the high-income category denomination issue arises. Other organizations follow a variety of practices in this field, usually on the basis of historical or other non-economic criteria (see Annex 5). The question is not without practical implications, however. For example, GATT rules allow preferential treatment to be granted to developing countries. While the rules do not explicitly refer to any classification scheme, there is a widespread feeling that some industrial countries granting preferences may take Bank classification into account, although they also can, and occasionally do, terminate preferences for economies still classified as "developing" by the Bank. A less closely operational, but nevertheless politically charged issue may also arise in granting and defining "development assistance."

68. All arguments bearing on use of per capita GNP as opposed to other criteria for operational Bank decisions, are equally valid in terms of the dividing line between middle and higher income countries. If "maturity" in some sense is the true criterion, social systems, social and demographic indicators, and even political circumstances might be relevant. Some argue that even within the purely economic field, considerations relating to GNP should be supplemented with others, like the role of foreign investment, dependency on foreign markets, the role of nonfactor service payments, or the definition of "residents."

69. However, proposals to supplement or replace the income criterion by some composite measure of social progress that would incorporate such indicators as health, education, nutrition and female advancement suffer from several basic problems. Data in this field are weaker than economic measures. Consensus is also unlikely on what

measures assess social development, and on the relative weights attached to them. There is likely to be broad agreement that low infant mortality and high life expectancy are signs of progress; and that so is education. But what is the tradeoff between them? What is the tradeoff between primary and secondary education? Is income distribution to be included, and what type characterizes "advanced" societies? What about criminality? And should a country that devotes a large share of income to social improvement be graduated by the Bank sooner than one that does not? The more one reflects on these points, the more it appears that social indicators as much reflect the choices made by a society on uses of its income, as its economic advancement.

70. Many of the other indicators proposed rely on criteria on which it would be difficult to reach universal agreement. For instance, some countries have relatively high life expectancies and education levels; this would hardly warrant reclassifying them into categories which receive fewer operational benefits. Indeed, a composite of economic and social indicators might run counter to the Bank's avowed concern about social progress, by accelerating graduation of the countries that respond most effectivly in this dimension.

71. It would be even more difficult to agree on the importance to be attached to criteria like the share of foreign capital in the domestic economy (or a specific sector of it, e.g. manufacturing). Inasmuch as the foreign investors are actually earning incomes, the use of the *national* (as opposed to *domestic*) product concept already makes allowance for that. Less tangible aspects of such investment ("domination" of the domestic economy by foreigners, sensitivity to outside decisions, etc.) have implications that one cannot weigh objectively. For instance, ability to attract foreign investment in manufacturing, or a high export to GNP ratio, can be interpreted as a weakness, because they show dependency on the rest of the world; or a strength, i.e. ability to compete for capital and for external markets.

72. In any case, the immediate reclassification decisions are not dependent on the way these arguments are settled. Hong Kong, Singapore, and Israel not only have high incomes; they are also advanced in terms of most social indicators.

73. The governments of the British Crown Colony of Hong Kong and of Singapore have argued that residency definitions different from those of the *SNA* should be used for calculating their per capita GNPs for operational purposes. While the Bank has continued to adhere to the generally accepted *SNA* definitions, and to use the official data published by the Hong Kong and Singapore governments, which also follow *SNA* rules, we have also calculated the incomes adjusted for these governments' favored definitions; the adjustment is not large enough to affect the classification issue.

74. While the Bank does not directly use ICP for country classification purposes, ICP is a valuable complement to other information and is always carefully analyzed. In the last fully published ICP, Phase IV for 1980, the per capita GDPs of Hong Kong and Israel (Singapore is not a participant) are markedly higher than those of Ireland and Spain. It is noteworthy that among countries now classified by the Bank in the middle-income group, these are the only ICP participants for which this is the case. Venezuela, Greece, Hungary and Poland (in descending order) all had ICP-determined 1980 per capita GDP volumes lower than Spain and Ireland.

75. A related country classification issue concerns the economies now classified as "high-income oil exporters." These are economies heavily dependent on hydrocarbon exports, with high per capita income levels. It has been said that the GNPs of these countries, because of present national accounting methods, do not properly reflect their dependency on exhaustible resources. As noted above, this cannot, in any case affect *gross* national product, which does not provide for any depreciation or wear and tear on capital, man-made or natural. Were one considering *net* national product, it is by no means certain that such provisions for these producers of natural resources with very large reserves would be larger than the provisions for depreciation of other items, say, environmental degradation, for other countries. High-income oil producing countries have reserves sufficient for at least a century, at the end of which the economic value of the remaining reserves cannot now be known. Making provision for such a remote event, and deducting it from current income, does not have compelling appeal. In any case, if oil reserves were treated as an asset, new discoveries of proven reserves might be treated as income; the resulting adjustment might be upwards, not downwards.

The Proposed Country Categories

76. As agreed by Executive Directors in 1984, stated prominently in WDR, and reaffirmed in this paper, per capita income constitutes the Bank's main criterion for classifying countries. **We now propose to elaborate this as follows:**

The Bank classifies economies for certain operational and analytical purposes according to their per capita GNP. The high-income, middle-income (itself

divided into upper and lower) and low-income groups constitute the main categories. In general discussion, the set of middle-and low-income economies may sometimes be referred to as "developing countries." The use of this term is convenient; it is not intended to imply either that all economies in this group are actually developing or that economies excluded from it have all reached some final stage of development. Moreover, the term "country" does not imply any judgment by the World Bank on the legal or other status of any territory.

77. The dividing line between "low-income" and "middle-income" countries will continue to be $200 in 1971 prices. The dividing line between "lower middle-" and "upper middle-income" economies will continue to be $850 in 1972 prices, both adjusted by the Bank's "SDR" deflator (to $480 and $1,940, respectively, for 1987). **It is proposed that $6,000, in 1987 prices, become the benchmark for separating "middle-income" from "high-income" economies.** The two lowest income countries traditionally classified as "industrial," Spain and Ireland, along with Israel, Singapore, and Hong Kong, will therefore be classified as "high-income economies," as will also Kuwait, Qatar, Saudi Arabia (subject to confirmation of preliminary estimates) and the United Arab Emirates. Also included in this group, although they are not actually reported in the main *WDI* tables because their populations are less than a million will be: Bahrain, Greenland, U.S. Virgin Islands, Bahamas, Faeroe Islands, Brunei, Luxembourg, Iceland, and Bermuda. Subject to confirmation of preliminary estimates, Libya would be classified as a middle-income developing country. For operational purposes, the middle-income group would be further subdivided by income levels to distinguish countries that are eligible for IDA loans, 17-year IBRD loans, or graduation. In addition, criteria other than income would be used for forming, from time to time, appropriate regional and analytical subdivisions (Sub-Saharan Africa, highly indebted countries, etc.). These categories will also be used in the annually published *World Development Indicators* which contain the most complete presentation of statistics for countries grouped into categories.

NATIONAL ACCOUNTS ISSUES

and

ALTERNATIVE MEASURES OF INCOME

Concepts and Definitions

1. A nation's GNP is the sum of the value of goods and services produced in its territory, plus the factor income of nationals temporarily living abroad, less the factor income of foreigners temporarily living in the territory. This definition needs to be rendered more precise to be usable, and indeed whole volumes are taken up by definitional and similar issues in the description of the United Nations' *System of National Accounts* (*SNA*). The issues most relevant for Bank analyses are indicated in Box A1.1. Issues about prices are noted there only in passing (e.g. between factor costs and market prices) but are considered more generally in Annexes 3 and 4, in the context of choosing conversion factors. Hence, Box A1.1 concentrates more on coverage issues such as imputations for certain products and services (the food produced and consumed by the same farming family), exclusions (domestic services rendered by family members, and racketeering transactions, e.g., drugs and prostitution), and similar issues.

2. The upper section of Box A1.1 summarizes the basic accounting identities of *SNA*, which proceed on three tracks: production, income, and expenditure. In the *SNA* itself, major aggregates such as GDP and national income (NNP) are explicitly defined. GNP is not included in the *SNA* framework but the item of difference between GDP and GNP (net factor income) is; and the revision of *SNA* envisaged for 1990 reinstates GNP in *SNA*. Also on the borderline of *SNA* (as discussed in paragraphs 25-28) is the Bank's constant price measure of gross national income (GNY). The lower section of the box is divided into two parts. The first illustrates economic activities that are in *SNA* but difficult to measure (even through surveys and the like) and the second shows some economic activities that are not conceptually included in the *SNA*. The basic identities and issues arise equally in current and constant price national accounts except that GNY exists only in constant prices, and index number problems may obscure the parallelism.

3. GNP is *gross*. No deduction is made for the wear and tear and reduction of capital, man-made or natural. No account is taken of the deterioration of highways and machinery, of pollution, or of the exhaustion of natural resources. A *net* national product (NNP) concept would be more meaningful for many purposes. One would then deduct from the acquisition of new capital goods or gross investment some allowance for the costs incurred on account of aging and intensity of use of the existing capital stock. Unfortunately, estimates of depreciation are not always available for statistically advanced countries, and are even scarcer (and less reliable) in developing countries. This is why most discussion of economic progress focusses on changes and comparisons of gross, rather than net, product. (See paragraphs 53-55 in this annex.)

4. Under current *SNA* conventions, even in NNP, no allowance is made for environmental degradation or depletion of natural resources. In other words, the derricks and other equipment on an oil-well are depreciated, and the reduction in their value is deducted from GNP to arrive at NNP; but no such adjustment is made for the reduction in oil reserves. Similarly, irrigation equipment would be depreciated, but, even under the NNP concept, no adjustment is made for the fact that increasing use is made of limited amounts of available water.

5. The disregard of the impact of human activity on natural resources clearly limits the overall significance of NNP numbers. In the long run, it may be desirable, and perhaps even feasible, to develop more comprehensive concepts. The difficulty of so doing is, however, enormous. For instance, the definition of "natural resources" varies. In today's industrial countries forests are a natural resource, but not very long ago natural resources, that is the cultivable area, were increased by clearing away

Box A1.1: *SNA* concepts: measurement and coverage

SNA CONCEPTS

Production	*= Income*	*= Expenditure*
Value added in:		
Agriculture	Compensation of employees	Private consumption
+ Mining		+ General government consumption
+ Manufacturing	+ Operating surplus of enterprises	
+ Construction		
+ Utilities	+ Depreciation	+ Investment
+ Trade and transport		+ Exports of goods and nonfactor services
+ Other private services		
+ Government services		– Imports of goods and nonfactor services
= Gdp at factor cost		
+ Indirect taxes less subsidies	+ Indirect taxes less subsidies	
Gdp at market prices	**Gdp at market prices**	**Gdp at market prices**
	+ Factor income payments less receipts	+ Factor income payments less receipts
	– Depreciation	= Gnp at market prices
	= National income (NNP)	
Additionally, in constant prices, the Bank measures:		
		+ Terms of trade adjustment
		= Gross national income (GNY)

Included in SNA, but difficult to measure (shown where measurement may occur):

Production	*Income*	*Expenditure*
• Small-scale activities	• Wages and salaries from informal services	• Own consumption (subsistence, etc.)
• Informal, moonlighting activities	• Profit and income from self-employment	• Major repairs and maintenance
		• Contraband trade
• Reforestation		• Imputed rents and depreciation for owner-occupied dwellings

Not included in SNA (but shown where measurement could occur):

• Household services of family members	• Allowance for depletion of natural resources	• Routine repairs and maintenance
• Discovered resources		
• Racketeering		

forests. During the nineteenth century, coal became an increasingly valuable natural resource, before losing much of its economic value in recent decades. Moreover, if one is to treat the use of some natural resources as the sale of assets, one must first find means to reflect the state of such assets and also to account for valuation changes in them. To incorporate natural resources in national accounts, ways would have to be found to include their contribution, and not just to record their depletion; before deducting the reduction in mineral reserves, one must first account for their discovery.

6. The United Nations Statistical Office (UNSO), in coordination with an Intersecretariat Group that includes the Statistical Office of the European Communities (SOEC), the OECD, the World Bank, and the International Monetary Fund, is at present revising the *SNA*. The issue of the depletion of natural resources has been taken up by the Intersecretariat Group, and it is expected that the new *SNA* (to be completed by 1990) will recommend that satellite accounts should be built to measure certain natural phenomena, without trying to incorporate them into a single number like NNP.

7. Many alternative measures of income can be developed from the *SNA*; still more can be constructed by recognizing variants that have been found useful by some countries for their own analytical purposes but have not swayed the international community. Indeed, GNP itself has a checkered career in the *SNA*, having been exiled by the last (1968) revision but undergoing rehabilitation in the forthcoming (1990) revision. The first decision, then, is to decide how many, and what type of alternative measures of income should be studied for the Bank's purposes.

Domestic and National Product - GDP vs GNP

8. The distinction between domestic and national measures of income is important. Conceptually, GDP, as defined in the *SNA*, measures the value of the total final output of goods and services produced *in* an economy. GNP measures the *domestic and foreign* output *claimed by residents of an economy*. The two measures differ by the factor incomes received from and paid abroad, i.e. income received by residents as compensation for factor services rendered overseas, less payments abroad for factor services provided by nonresidents. These factor incomes comprise investment and property income, including interest on debt, and labor income, i.e., the income that individuals earn in an economy other than the one in which they reside.

9. For most Bank borrowers significant differences between GDP and GNP relate to labor income (from employment of the residents of a country who work abroad for less than one year) and interest (including due but not paid, i.e., in arrears). For highly indebted countries, such as Chile and Jamaica, interest payments on external debt are high (and far outweigh factor income inflows). Consequently, GNP is substantially lower than GDP. For some other countries, such as Yugoslavia and the Yemen Arab Republic, the addition of labor income from abroad renders GNP noticeably larger than GDP. Thus resources available to the residents of an economy can be substantially reduced or increased as a result of external factor income. However, the compilation of these data often causes problems.

10. Measuring labor income paid to or received from abroad is difficult. "Residency" is defined in *SNA* as staying for over one year in a country. However, compilers often do not have information on the length of time workers stay abroad. The income of those temporarily (less than one year) working abroad should be treated as a factor income receipt by the home country but may not be distinguishable in practice from related transfer receipts (remittances of workers who stay in the country for a year or more). National practices for distinguishing between labor income and workers' remittances differ substantially. Since the 1983 study, which alluded to the problem, Bank staff have made concerted efforts to improve the international comparability of these practices.

11. The treatment of population—the denominator of per capita GDP and GNP—should in principle, be consistent. For GDP it should include foreigners temporarily living in the country (though not tourists) and exclude nationals temporarily living abroad; and conversely, for calculating per capita GNP. In fact, such adjustments to population are almost never done, largely for lack of data and because demographers use different concepts (de jure versus de facto population). For a given GDP, a change in residency status should affect per capita GNP only by the amount by which the per capita income of the migrant (workers and their families) differs from that of the rest of the population. Migrant workers will tend to have higher earnings and per capita incomes than prevail in their countries of origin. They will often have lower earnings than prevail in the host country (though expatriate managers are often an exception). Whether or not they also have lower per capita incomes will partly depend on the location of their families: "guestworkers" may have low wages but relatively high per capita incomes if they leave their families behind. Even if they send money home, this should count as a transfer if they themselves are considered residents of the host country.

12. It should be noted that migrant worker residents of the host country may later migrate back to their home country. They are likely to transfer their savings home periodically while resident in the host country, or in a lump sum, at the end of their stay. Periodic transfers, which are classified in the *SNA* as current transfers, reduce the national disposable income of the host country and increase the national disposable income of the home country.[1] Lump sum transfers are classified as capital transfers in the *SNA*. They do not affect the national disposable income of either the host or the home country. Thus, on the basis of the *SNA* methodology, host and home countries' national disposable income would be affected by migrant workers' choice between periodic and lump sum transfers. In practice, few countries are able to distinguish between workers' remittances and migrants' transfers. Even the distinction between labor income and transfers is difficult, and often somewhat arbitrary.

13. In principle, though, countries whose receipts of periodic labor remittances are larger than payments, have disposable incomes larger than GNP. Similarly, countries whose payments are larger than receipts have disposable incomes smaller than GNP.

Improvements to Data: Bank Actions

14. Bank staff have made systematic though modest efforts to improve the quality of data. The economic indicator tables attached to the Country Briefs circulated biannually to the Board now constitute a key instrument of cooperation between central staff (IEC) and regional economists for that purpose. These tables embody the statistics deemed to be operationally most significant and which therefore deserve the closest attention. Divergences among available series are systematically analyzed; country economists are requested to obtain additional information in the course of their visits to the countries; and adjusted series are prepared within the Bank when there is convincing evidence about specific deficiencies of the official national statistics and there are reasonable means to correct them. Given the scarcity of resources that can be devoted to such quality checks and improvements, a regular dialogue has been found to be the most effective means for improving statistics in the majority of the countries.

15. In special cases, missions of IEC staff to specific countries have also helped evaluate the weaknesses of national accounts, and sometimes to persuade and assist national authorities make substantial methodological improvements to their national accounts.[2] (See Box A1.2.) Occasionally, such missions helped provide benchmark estimates of per capita GNP (i.e. Pacific Islands) and in some cases, missions have confirmed earlier doubts about the official national account series, without obtaining enough information to replace them.

Box A1.2: Cameroon: Bank staff adjustments to official estimates

Cameroon is a case in which operationally significant deficiencies in the national accounts led to a mission and subsequent adjustments in GNP. The major issue was reporting of petroleum production and exports. The mission, in 1988, reviewed the entire national accounts. Adjustments for petroleum as well as subsistence agriculture, rural construction, commerce, banking, and investment were made. The revised estimates better reflect the actual structure of the economy; it is understood that the new estimates are now being adopted by the national compilers.

16. Effective technical assistance has been possible only in rare cases. One precondition is that both Bank operational staff and the government give strong priority to resolving specific statistical issues. Central staff resource allocation must balance compilation and dissemination of statistics, a major priority against technical assistance to improve the data. Operational staff quite reasonably direct their statistical efforts towards evaluating and monitoring specific Bank projects and programs, but this does not in itself promote continuity and balance in the basic data work of national statistical systems. Other institutions of the United Nations family have primary responsibility for statistics, and some have reduced their efforts markedly in response to budgetary constraints. The Bank too has reduced, albeit marginally, the staff and other resources allocated to statistical and data work. One must also recognize that, given the many priorities facing member governments, good-quality, timely data have not always been accorded high priority.

17. Technical assistance by itself cannot improve national data if this is not given adequate priority by national authorities. Such 'riority is rarely given. In some

1. While disposable income is formally an *SNA* concept, defined as GDP plus net transfers from abroad, it is rarely used in practice and was omitted from BoxA1.1 for the sake of simplicity.

2. Brazil, Cameroon, Chile, Congo, Egypt, Jamaica, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Sri Lanka, and Uganda.

cases, national governments may purposely influence statistical organizations to report information that is favorable to the government. Upward biases in growth rates have been identified in several cases. More generally, governments rarely have the time to focus on the organizational needs of good statistics, or to devote resources to an area where improvements are necessarily slow to come and whose benefits are not always fully perceived. This is even the case for well-trained economists, whose detailed quantitative discussions often begin with the statement: "The data are known to be weak, but...."

A Major Source of Difficulties: Informal Economic Activities

18. One particular source of weakness and lack of comparability in data derives from differences in the treatment of informal activities, whose share is usually particularly important in developing countries. Their scope varies not only with the structure of economies but also with their legal, institutional, political, and economic history. The relative importance of such activities is probably greatest in some Sub-Saharan African countries where on average around one-half of total output may reflect informal activities. In agriculture, subsistence output may be as high as four-fifths of total output. Such informal activities must, in principle, be fully included in GDP, but they are by no means uniformly recorded in national accounts. In many cases, the Bank staff know little about estimation procedures used by compilers.

19. Informal sector activities are mainly performed by households producing goods and services individually or collectively for their own consumption, but sometimes also for sale. These activities are diverse, at times difficult to locate for reporting purposes, and otherwise difficult to measure. Some producers, such as vendors in open markets, have no fixed address for mailing of regular statistical surveys, which leads to more reliance on expert (but nonetheless subjective) estimates.

20. The quality of estimates of informal sector output depends on the data collection system. Estimates of subsistence sector output will be reliable only if virtually all producers are covered (albeit through samples) and all production is captured. In many cases, however, surveys and even censuses are based on sampling frames that are outdated and heavily geared towards major commodities where other reporting mechanisms are generally in place. Even when supported by administrative records, and especially for crops, estimates may require subjective weighing of partial and possibly conflicting reports. The results can only be as good as the estimator's knowledge of the subject-matter. The measurement problem is even more complex for informal sector activities other than crop production, from which there is usually no regular and systematic data collection program. This is especially true for wholesale and retail trade and services.

21. Most developing countries include in their value added estimates some contribution made by the informal sector, but it is unknown what proportion is actually included. Country estimates of informal sector activities vary in coverage, valuation, and estimation methodology, within a given country, because the estimates depend heavily on informed guesswork, changes in staff can produce spurious variations over time in the importance of such activity within a given country.

22. There are clearly major methodological differences in the treatment of informal activities. These do not merely affect the absolute size of production, or its sectoral distribution. Similar difficulties and differences affect estimates of uses of production, i.e., the size and shares of consumption, investment and savings. It has been alleged that significant differences in national savings rates and capital-output ratios are sometimes due to methodological differences. The same may be true for income levels andto some extent even for growth rates.

23. Obviously, the costs of statistical systems must essentially be borne by national governments. However, given the major analytical use made of the data by the international community, and the resources devoted to a variety of cross-sectional and other analytical exercises and statistical studies which rely on the data, the level of the international effort directed at improving the data seems paradoxically low. Resources permitting, we propose to focus attention on this issue, and perhaps develop, in cooperation with other international agencies, a work program better to understand, and ultimately to reduce divergences in this field.

Growth and Growth Rates: Analytical uses and relationship to "benchmark"-based comparisons

24. Most comparative analytical examination of national products is less concerned with levels than with growth rates. For a variety of reasons, inherent in the index number problem, even if the basic data were all established precisely and in a fully comparable manner, growth rates and growth rate comparisons would be greatly influenced by methodological choices. Some of these choices are made by the national accountants themselves, who generally (if implicitly) use Paasche-type price indexes, evaluating each year's GDP at prices corresponding to those of a "base year," itself moved up from time to time. For an international agency like the Bank, the two main

issues (beyond all those concerning comparisons for a given year) relate to the choice of a base year and the related issue of partial rebasing; and to the choice between income and product at constant prices.

25. The second one of these issues is intuitively more obvious. At any one time, as shown in Box A1.1, in a closed economy an identity prevails between production (agriculture, industry, etc.) incomes (of labor, property owners etc.) and expenditure (consumption and investment). In an open economy, i.e. one including economic contacts with the rest of the world, the identity still prevails provided appropriate account is taken of foreign transactions. Thus domestic absorption may exceed domestic production by the same amount as imports exceed exports; this will also show up as a reduction of net foreign assets, i.e. negative foreign investment.

26. Over time, however, the equality does not hold. Suppose domestic production is constant in volume, i.e. GDP in constant prices does not move. Suppose, furthermore, that the price of exports rises sharply relative to that of imports. Then, exports stable in constant prices can buy greater quantities of imports, which in turn allows consumption and investment to rise.

27. To analyze such phenomena, the Bank developed the concept of gross domestic income in constant prices, abbreviated as GDY. GDY is derived from GDP at constant prices by explicitly adjusting for changes in the terms of trade. The terms of trade adjustment is the difference between exports deflated by the implicit deflators for exports (the normal procedure), and exports deflated by the implicit deflator for imports. As in all indices, this one is also sensitive to the choice of the base year, whose influence on the terms of trade adjustment can be quite significant. Indeed, in certain cases, particularly in periods remote from the base year, the terms of trade adjustment relative to the previous year can actually be *positive* even if the terms of trade continue to deteriorate (if the *volume* of exports is also declining).

28. When to refer to the growth of GDY rather than that of GDP depends mostly on the purposes of the analysis. By and large, if growth "performance" is considered, the ability of governments to obtain satisfactory growth rates, GDP would seem to be the more satisfactory measure. On the other hand, if the preoccupation is with ultimate results, the way in which the combined impacts of their own efforts and of global circumstances have affected a country, then GDY may be a more relevant consideration, or indeed - because it also reflects the impact of changes in interest and other factor payments, Gross *national* income (GNY).

29. The issue of the relationship between income and product at constant prices arises even if one considers a single country, and no matter what base year one uses. When the Bank considers, for comparison or aggregation, many countries, a separate issue arises even for GDP. National accounts at constant prices are compiled in a variety of base years by national authorities. For comparing levels and aggregating growth rates, they must be "rescaled" to a single "base year." The base year currently used by the Bank is 1980. These base years have been changed every five years in the past, but, because 1985 was a particularly distorted year in exchange markets, most international organizations decided to await more normal exhange rate relationships before rebasing.

30. In rescaling to 1980, for each major sector (industry, agriculture, and services) one starts with the value of production in *1980 current prices*. The value of production in previous and succeeding years is derived by multiplying that 1980 value with the ratio of the sector's production in the target year to its production in 1980, in the country's own constant price national accounts.

31. For each sector, this constitutes a mere rescaling; the growth rate of the sector is derived from the country's own national accounts, and is not changed by the rescaling process. However, because relative price changes differ between sectors, the sum of the rescaled sectoral products will differ from the rescaled GDP. Hence, a choice must be made between using the original constant price GDP (rescaled to 1980 prices) and its growth rate, and record a "rescaling adjustment" between the value of GDP and the sum of the values of its rescaled components; and using the sum of the rescaled sectoral components as the proxy for GDP (*partial rebasing*).

32. The choice is not trivial: a research study undertaken for the Bank[3] has found that, out of 60 countries studied, in about one-fifth of them, the average growth rate of the partially rebased (1980) series over the 1970-1981 period differed from that of the original series growth rate by more than 1 percentage point per annum in the extreme cases.

3. *Methodological Problems in Cross-Country Analyses of Economic Growth*, June 1988, by Jean-Paul Azam and Sylviane and Patrick Guillaumont. PPR Discussion Paper.

33. After careful consideration, the Bank has decided to use the partially rebased GDP in all comparative work. This shift has finally been completed in 1988, and is fully reflected in the latest WDR and WDI. It is recognized that this method yields constant price GDP growth rates which, for certain countries and periods, can be significantly different from those of the countries' own data, from which they are derived. This is obviously a disadvantage, but it was felt that it is outweighed by two factors. One, relatively trivial, is that partial rebasing does away with the "rescaling adjustment" that would otherwise have to be added to rescaled sectoral values to bring their total up to the value of rescaled GDP. The more important consideration is that, in cases of major relative price changes when partial rebasing makes a substantial difference, the growth rate of partially rebased GDP is in some sense closer to the "true" growth rate than the original constant price GDP with an outdated base year, as the "reference year" is normally changed more often, and tends to be more recent, than the true "base year." However, because of the exceptional decision not to change the reference year to 1985, a few countries have now acquired true base years that are more recent than the reference year; the growth rates of the partially rebased GDP's of these countries are, presumably, less "true" than the original constant price growth rates.

Benchmark Estimates

34. This discussion has obvious implications for the analysis of growth rates. Not only must one choose between the product and income approaches for the particular analytical purposes one has in mind; with either approach, the outcome is dependent on methodological choices whose impact and complexity are great, particularly when international consistency is also demanded.

35. The particular choice bears importantly on the result. This is not always fully recognized by analysts who make great use of growth rates, particularly for cross-section studies.

36. The dependency of results on purely methodological choices weighs heavily against operational use of GNP estimates derived from "benchmark" levels multiplied by the appropriate index number. A priori, the benchmark idea is temptingly simple; instead of comparing per capita GNP numbers converted at the prevailing exchange rate, which necessarily fluctuates and often reflects various misalignments, one might seek out a benchmark year when misalignments were minimal, and multiply its per capita GNP levels, converted into the common numéraire, by the appropriate index number of GNP at constant prices.

37. Finding a year with minimal misalignments would be a matter of judgement. Only with great difficulty can one imagine that those for whom the choice has operational implications should all agree on the same year. Even then, the growth rate itself will depend on methodological choices. The necessity to make such choices is inherent in the index number problem. Analysts understand this, even if they do not often acknowledge it by appropriate testing of conclusions, i.e., verifying the robustness of results in the face of different methodological decisions.

38. The relationship to each other and to various guidelines of per capita GNP or income levels derived from benchmark estimates and growth rates would also depend on choices between legitimate methods. Countries operationally disadvantaged by the choice of a particular method would unavoidably argue for another, equally legitimate, method that yields results more favorable to them.

39. This does *not* mean that one must necessarily give up all hope of ever deriving indicators of development from data that are more detailed but less frequently available than the routine, annual, national accounts. Indeed, the Bank intends to pursue research into possible better ways of comparing economic capacities and development levels. However, even if such research is successful, deriving annual comparisons calculated by linking constant price growth rates to some benchmark is unlikely to become an acceptable procedure *for operational purposes.*

Some Illustrations of GNP and GNY

40. Despite the above-mentioned reservation, the process of linking occasional, detailed studies with more frequent but less rigorous estimates is worth noting. The objective, annual estimates of per capita GNP in a common numéraire, can be reached with detailed "benchmark" work on a less periodic basis plus extrapolation of the benchmark estimates with a growth rate of real income obtained by conventional national accounting methods. The main advantage of such a procedure is that it does not return each year to conversion via exchange rates, which is unarguably flawed when exchange rate policy moves against market forces. The main disadvantage is that the flaws tend to accumulate and reappear in benchmark years as debates about measurement of real income.

41. *Real Income* (GNY) represents the volume of goods and services that is (or could be) purchased with the total national product.

42. Table A1.1 shows how per capita GNP estimates can be derived from benchmark data and growth rates. The

first section of the table provides three different per capita GNP estimates for 1983, based on the growth of per capita GNY. Column 2 extrapolates 1975 per capita GNP in then-current US dollars to 1983 with a per capita GNY growth rate expressed in 1975 prices and U.S. price changes (GNP deflator) from 1975 to 1983. Similarly, columns 3 and 4 are calculated by extrapolating 1980 and 1985 per capita GNP in current US dollars by the per capita GNY growth rate ex'ressed in 1980 and 1985 prices, respectively, and adjusting each for US price changes betgeen the benchmabk and target iears. Hence, in each case the figures allow fob real growth and are inflated (or deflated) bi the US infladion rate for the corresponding period, i.e. 1975-83, 1980-8#, and 1985-83.

43. As shown in the table, the per capita GNP derived by applying the per capita GNY growth rate is sensitive to the choice of base year in some countries (e.g. Bangladesh, Burma, and China) but not in others, (e.g. Algeria, Bolivia, and Colombia). The pattern is not consistent across countries; i.e., no one benchmark year always generates higher (or lower) values. For 28 of the 102 countries, the 1975 base year generates the highest per capita income; for another 61 it is the 1980 base year. Only in 13 cases does the 1985 benchmark provide the highest estimate. Adequate data did not exist to carry out a similar comparison for a further 35 countries. Neither was there any marked uniformity in the pattern of relationships between the industrial market economies and the low income developing countries in the choice of base year.

44. General issues also arise when considering benchmark esdimates extrapolated by the GNP growth rates. A crucial one is to decide whether the benchmark refers to an "equilibrium" year, i.e., a year in which no major shocks in the economy have occurred, such as devaluation, changes in relative prices, or major structural changes. Various deflators may be used to inflate the extrapolated benchmark GNP per capita, including SDR-basket or US GNP deflators or the manufacturing unit value index, etc.

45. The second trio of benchmark results in Table A1.1 shows per capita GNP estimates for 1983 using much the same technique, except that the growth rate of per capita GNP, rather than of per capita GNY, is used. The difference between this and the first set of results provides a rough gauge of how the gains and losses from international trade affect the comparison.

46. Benchmarking exercises can also be performed using ICP estimates of per capita GDP in "international dollars." For example, results from ICP Phases III (1975), IV (1980), and V (1985) have been used as benchmarks for estimating per capita GNP in 1983. (See also Annex 4).

47. The variance among ICP Phases for a given country is affected by changes in ICP methodology, but it probably also reflects the impact of a "partial rebasing" exercise inherent in the ICP method. The classic index number problem becomes a major concern when estimating per capita GNP for operational and analytical purposes if a year of turmoil in international currency markets, like 1985, is used as a base year. These considerations help explain issues involved in finding a substitute for the *Atlas* method.

48. The *Atlas* method relies on conventional nadional accounts and, with rare modifications, official exchange rates. This very broad methodological choice precludes the subsidiary choice of one index number over all others as all other methods necessarily must do. When comparing current values, by definition, the index number issue does not arise. Nor is it likely that a country would deliberately undervalue its exchange rate or undercount its national income in order to obtain more favorable World Bank treatment.

49. All of the above does not preclude the usefulness of "benchmark" estimates and other references to the past as potentially useful checks on the validity of current estimates. In particular, staff will continue to pay close attention to sharp movements of real effective exchange rates as possible signals of the need to examine more closely the continued usability of the official exchange rate as a conversion factor. In some cases, and despite all the reservations formulated above, it may even be necessary to resort to references to the past and "benchmarking" methods to derive estimates of present per capita GNP levels; but such cases will be kept to a minimum, unless better and more objective methods are developed.

Other Concepts, Measures and Variants

50. *National Income* estimated for distribution to the population for consumption (or saving) is represented by the net national product (NNP) at factor cost. This takes account of the need to allocate some of the current income from production first to the maintenance of existing capital (to preserve the future flow of income without running down resources) before distributing it in the form of goods and services to the population.

51. In practice, even the capacity to estimate the depreciation of man-made capital is severely limited. In most countries, it is much more roughly estimated, and often at much greater intervals, than the gross product

itself. Hence the vast majority of analyses, both of the evolution of national economies over time and of their relationship with other national economies, focus on *gross* flows of national or domestic product.

52. That is certainly the practice at the Bank. Discussions and comparisons sometimes seek to refer to the wear and tear on physical capital, but statistical presentations and comparisons focus on *gross* product, mainly because for most countries reasonable data on *net* product are simply not available. Gross domestic (or national) product is the focus of growth discussions; economic structures are analyzed in terms of the shares of agriculture, industry, etc.; in terms of the shares of *gross* investment, consumption, exports; and in terms of their relationship to payments balance or foreign debt.

53. *Disposable Income* is represented by GNP plus net transfers received from abroad in the form of grants and other private or public unrequited transfers in cash or kind. It measures the total income available to a country for acquiring goods and services. (In practice, the range and sovereignty of choice of these goods and services may be restricted).

54. *Purchasing Power of Income or Real Expenditure.* For comparative purposes, when analyzing the economic performance of countries, it is meaningful to determine the value of a country's net output and national expenditure at a uniform set of international prices in order to ascertain how much it would cost in international currency to purchase a given set of goods and services. Purchasing power parities reflect the cost in national currencies of acquiring in the country concerned, the equivalent amount (quantity of goods and services) that a US dollar buys in the USA. Thus, when the national income (GNP) or any of its components are converted into dollar values using purchasing power parities for individual items of expenditure, rather than at a single overall official exchange rate, the resulting comparison with other countries in "international" dollars represents real differences in quantities (volumes) of net output as valued on the same common basis. The accounting issues are discussed more fully in Annexes 3 and 4.

55. *The Issue of Small Islands.* A November 1985 Board Paper[4] reviewed the quality, consistency, and international comparability of the published World Bank *Atlas* per capita GNP estimates for small island economies. The objective was to ascertain whether, relatively speaking, when compared with countries at similar stages of development, the per capita GNP of small island economies was biased or otherwise distorted by factors that influence their economic development.

56. The study arose from a belief that remoteness combined with small size (i.e., an inability to exploit potential economies of scale) might especially affect the comparability of estimates of per capita GNP. It generally concluded that, although small islands do indeed have to contend with several disadvantageous features of openness, remoteness, and small size, these problems were not unique and that such development handicaps were often shared by many other developing countries. Whilst having an influence on GNP, these features were not considered to be of such significance as to produce any major distortions in the measure of per capita GNP for small islands.

57. IEC continues to maintain and develop its economic and social data series on island economies through its own missions and closer contact with the main international agencies working in this area, such as the Asian Development Bank, the South Pacific Commission, the UN Regional Economic and Social Commissions (especially ESCAP), the Eastern Caribbean Secretariat, the Australian National University, and the Commonwealth Secretariat.

"Indigenous" Production

58. Some countries wish to subdivide the productive activities within their territory between those of transactors legally-defined as nationals and others, who are implicitly foreign. For individuals this tends to return rather directly to the issue of residency, and *SNA*'s adoption of analytic rather than legal criteria in the interest of international comparability. While the issues are fundamentally the same for enterprises, the lines of argumentation are less direct because retained earnings accumulate naturally in enterprises, whether foreign or domestically owned. Hence, even in the long run, the value added by foreign-owned or controlled corporations will normally exceed repatriated earnings (which are included in net factor income and thus in the adjustment from GDP to GNP). This leads some countries with sizeable foreign ownership of enterprise to argue that income measures on *SNA* overstate their income levels.

4. Specifically, the statistical annex, "The Measurement of GNP in Small Island Economies"; to Board Paper R85-335, IDA/R85-134, "Terms of Lending to Small Island Economies Graduating from IDA."

Table A1.1: Per capita GNP for 1983: *Atlas* methodology and selected alternatives

Country	*Atlas* Actual 1983	Gross National Income (GNY) 75 GNY gr.	Base 80 GNY gr.	Base 85 GNY gr.	Real Gross National Product 75 GNP gr.	Base 80 GNP gr.	Base 85 GNP gr.	ICP Results (by Phase) III GNP gr.	IV GNP gr.	V GNP g.
Lao, PDR	90	..	..	..	..	..	..	..	..	..
Bhutan	110	..	..	..	..	..	..	..	..	..
Ethiopia	120	150	140	130	150	140	130	..	340	180
Chad	130	180	200	100	180	200	100	..	..	..
Bangladesh	150	260	170	130	250	170	130	..	..	..
Mozambique	160	..	..	170	..	..	170	..	..	..
Nepal	160	..	..	..	180	160	130	..	..	..
Burkina Faso	170	190	230	150	200	230	150	..	..	..
Burma	180	270	230	160	250	240	160	..	..	..
Mali	180	240	280	170	240	280	170	..	400	230
Guinea-Bissau	190	260	190	170	230	180	170	..	..	..
Malawi	190	180	200	190	210	200	170	530	470	390
Maldives	230	..	..	..	220	170	190	..	..	..
Burundi	240	200	230	220	200	240	220	..	..	..
Rwanda	260	210	290	260	200	280	260	..	..	..
Haiti	270	270	260	260	300	270	260	..	..	..
Togo	270	430	380	250	480	390	250	..	..	..
Benin	280	290	370	250	300	390	250	..	..	..
India	280	320	300	250	280	300	250	950	760	860
Central African Rep.	290	270	340	250	270	340	250	..	..	..
Guinea	290	410	340	260	440	330	270	..	..	..
Zaire	290	350	430	280	410	460	290	..	..	..
Madagascar	300	280	330	290	360	330	290	..	550	340
China	310	470	420	230	380	420	230	..	..	..
Tanzania	310	250	300	300	270	300	290	..	370	240
Comoros	320	..	..	310	340	430	300	..	..	..
Niger	320	470	500	350	470	450	350	..	..	..
Sri Lanka	330	540	340	300	450	330	290	1,660	1,610	..
Ghana	340	350	360	290	460	370	300	..	..	..
Kenya	340	380	430	320	430	460	320	790	670	480
São Tomé & Principe	340	740	380	360	1,060	420	360	..	..	..
Gambia, The	350	350	410	410	360	430	410	..	..	..
Pakistan	350	290	360	300	270	380	310	1,260	1,370	..
Sudan	380	470	530	450	450	520	460	..	..	..
Sierra Leone	390	340	350	420	350	380	400	..	..	..
Cape Verde	430	830	510	370	830	540	380	..	..	..
Senegal	430	560	620	420	530	610	430	..	870	710
Mauritania	460	420	530	430	530	510	470	..	..	..
Bolivia	490	500	470	490	580	470	510	..	1,510	..
Liberia	500	460	540	480	660	560	500	..	..	..
Yemen, PDR	500	..	..	..	..	470	540	..	..	..
Lesotho	510	510	520	..	500	520	490	..	..	..
Guyana	550	570	570	550	990	650	550	..	..	..
Solomon Islands	570	..	480	510	570	620	560	..	..	..
Zambia	570	670	570	510	830	660	580	850	690	430
Indonesia	580	570	620	520	460	610	520	..	1,430	..
Egypt, Arab Rep.	630	850	650	600	720	670	580	..	..	..
Yemen Arab Rep.	640	390	610	560	320	610	560	..	..	..
Honduras	670	600	610	640	700	670	640	..	1,160	..
Morocco	710	930	1,020	660	1,000	1,030	660	..	1,390	1,200
Philippines	750	720	810	840	740	820	840	1,890	2,070	..
Côte d'Ivoire	760	830	1,140	720	920	1,200	760	..	1,340	970
El Salvador	760	570	670	690	710	730	690	..	1,270	..
Papua New Guinea	760	800	790	720	870	880	710	..	..	..
Tonga	770	..	..	..	..	..	..	..	..	..
Thailand	810	780	840	750	760	860	730	2,050	..	2,880
Saint Vincent	830	..	820	670	690	750	710	..	..	..
Zimbabwe	850	..	870	790	890	870	790	..	1,120	1,120
Cameroon [1]	870	830	1,030	700	760	1,050	730	..	1,240	1,220
Botswana	920	870	820	700	940	1,080	740	..	1,640	1,260
Swaziland	940	570	680	..	920	1,000	840	..	..	..
Nigeria [1]	970	660	1,030	960	750	980	950	..	900	520

.. = Not available

Country	*Atlas* Actual 1983	Gross National Income (GNY) 75 GNY gr.	Base 80 GNY gr.	Base 85 GNY gr.	Real Gross National Product 75 GNP gr.	Base 80 GNP gr.	Base 85 GNP gr.	ICP Results (by Phase) III GNP gr.	IV GNP gr.	V GNP g.
Dominica	1,000	..	..	..	700	960	880	..	..	..
Grenada	1,030	..	..	..	..	960	900	..	..	..
Costa Rica	1,060	1,540	1,880	910	1,810	1,930	930	..	3,050	..
Belize	1,070	..	..	..	1,760	1,210	980	..	..	..
St. Lucia	1,080	..	1,110	..	1,020	990	910	..	..	..
Dominican Rep.	1,130	1,060	1,200	1,190	1,140	1,210	1,180	..	2,380	..
Mauritius	1,140	980	1,430	960	1,340	1,470	970	..	..	..
Peru	1,140	1,430	950	1,060	1,640	980	1,040	..	2,410	..
Guatemala	1,170	950	1,130	1,180	1,130	1,150	1,170	..	2,340	..
Nicaragua	1,170	710	700	1,300	770	780	1,300	..	..	..
Turkey	1,180	1,430	1,700	1,020	1,440	1,740	1,040	..	..	3,330
Congo, People's Rep.	1,210	1,300	1,390	1,130	930	1,370	1,170	..	..	..
Tunisia	1,250	1,520	1,580	1,140	1,450	1,550	1,100	..	2,450	1,870
Ecuador	1,310	1,050	1,320	1,250	1,080	1,360	1,210	..	2,700	..
Jamaica	1,370	1,520	1,350	1,450	1,600	1,440	1,540	2,000	..	..
Saint Kitts and Nevis	1,380	..	1,320	1,300	1,540	1,320	1,310	..	..	..
Colombia	1,440	1,130	1,390	1,320	1,140	1,400	1,320	3,260	3,230	..
Syrian Arab Rep.	1,640	1,790	1,780	1,650	1,700	1,780	1,650	3,680	..	..
Paraguay [1]	1,660	1,330	1,480	1,610	1,370	1,480	1,570	..	2,340	..
Jordan	1,680	1,490	1,840	1,600	1,440	1,830	1,620	..	..	..
Namibia	1,690	..	..	..	2,130	1,850	..	..	..	..
Antigua and Barbuda	1,700	..	1,820	..	1,880	1,640	1,400	..	..	..
Fiji	1,700	1,590	1,740	1,590	1,960	1,840	1,590	..	..	..
Brazil	1,820	1,900	2,100	1,540	2,260	2,140	1,540	3,190	3,370	..
Poland	1,830	..	..	1,560	..	..	1,560	..	4,540	3,640
Malaysia	1,900	2,280	2,060	1,770	1,870	2,170	1,790	4,250	..	..
Chile	1,920	1,580	1,960	1,800	1,970	2,030	1,710	..	3,410	..
Argentina	1,950	2,540	1,870	1,910	3,150	1,900	1,890	..	3,680	..
Panama	1,980	1,830	2,000	1,790	2,040	2,040	1,850	..	3,730	..
Korea, Rep.	2,020	1,560	2,310	1,690	1,300	2,310	1,700	3,990	3,670	3,600
Macao	2,140	..	..	..	..	..	..	..	..	..
Hungary	2,160	..	2,360	2,010	..	2,430	1,990	7,180	5,680	5,200
Romania	2,180	..	..	..	..	2,100	..	..	..	..
Portugal	2,230	2,970	2,680	2,080	3,030	2,750	2,080	..	4,390	5,630
Mexico	2,290	2,600	2,460	2,070	2,770	2,560	2,050	4,650	..	..
Seychelles	2,380	..	..	..	1,870	2,130	2,020	..	..	..
Algeria	2,430	2,230	2,570	2,230	1,780	2,490	2,220	..	..	..
South Africa	2,430	2,180	2,130	2,250	2,470	2,290	2,270	..	..	..
Uruguay	2,460	2,250	2,680	2,380	2,850	2,720	2,320	4,730	4,070	..
Yugoslavia	2,640	2,910	3,740	2,500	2,990	3,740	2,440	5,470	4,660	4,750
Suriname	2,680	..	..	..	2,430	2,650	2,690	..	..	..
Malta	3,480	3,940	3,890	3,110	3,990	3,960	3,140	..	..	..
Gabon	3,950	..	..	4,620	3,210	4,020	3,880	..	..	..
Greece	3,970	4,620	5,060	3,620	4,730	5,030	3,580	..	5,910	5,770
Venezuela	3,980	3,040	2,970	3,820	3,580	3,400	3,970	..	4,640	..
Barbados	4,010	..	..	..	3,220	3,330	3,610	..	..	..
Spain	4,670	4,720	6,130	4,160	4,880	6,280	4,200	6,930	7,340	7,270
Ireland	5,030	4,700	5,860	4,660	5,010	5,690	4,640	5,570	6,350	6,620
Hong Kong	6,230	6,880	7,090	5,230	5,750	7,160	5,430	..	9,700	9,590
Trinidad and Tobago	6,450	4,500	4,880	7,340	4,420	5,510	7,430	..	..	..
Israel	6,480	7,420	6,650	6,230	7,100	6,430	6,100	..	8,500	..
Singapore	6,930	..	..	..	5,860	6,800	5,950	..	..	..
Oman	7,090	..	6,250	5,700	1,760	6,380	5,440	..	..	..
Bahamas	7,170	..	7,060	5,630	7,790	6,450	5,870	..	..	..
Italy	7,480	7,680	8,750	6,660	7,840	8,700	6,660	7,730	9,090	10,350
New Zealand	8,390	8,140	8,460	7,680	7,680	8,510	7,630	..	..	9,880
Belgium	9,110	10,910	13,940	8,170	11,590	14,300	8,220	10,360	10,860	10,290
United Kingdom	9,180	7,780	9,730	8,130	7,250	9,720	8,110	9,060	10,170	10,360
Austria	9,310	9,750	12,250	8,260	9,580	12,220	8,250	10,270	10,580	10,370
Netherlands, The	10,080	10,950	14,100	9,040	11,270	13,970	9,080	9,860	10,940	10,830
Japan	10,320	9,590	12,600	8,830	9,370	12,630	8,850	10,570	10,750	10,820
France	10,630	12,090	14,270	9,710	11,940	14,130	9,770	11,770	11,770	11,200

.. = Not available

Country	*Atlas* Actual 1983	Gross National Income (GNY) 75 GNY gr.	Base 80 GNY gr.	Base 85 GNY gr.	Real Gross National Product 75 GNP gr.	Base 80 GNP gr.	Base 85 GNP gr.	ICP Results (by Phase) III GNP gr.	IV GNP gr.	V GNP g.
Finland	10,900	10,630	12,580	9,640	10,650	12,670	9,690	..	10,730	10,860
Denmark	11,390	12,870	15,980	9,900	12,990	16,130	9,940	11,070	11,970	11,420
Germany, Fed. Rep	11,450	13,300	15,850	10,050	13,520	15,990	10,020	11,900	12,110	11,470
Iceland	12,240	13,400	14,980	10,910	14,210	14,730	10,890	..	..	..
Australia	12,480	12,730	12,200	11,210	12,800	12,210	10,990	..	..	11,340
Sweden	12,540	13,940	16,730	10,940	14,740	17,040	11,050	..	..	11,870
Canada	12,670	14,260	12,470	11,090	14,080	12,500	10,980	..	13,660	14,370
Saudi Arabia	12,960	14,400	15,790	..	9,890	12,820	8,680	..	..	..
Norway	14,150	14,850	16,160	11,940	13,730	16,000	11,870	..	14,210	12,610
United States	14,560	14,320	14,610	12,610	14,230	14,490	12,630	13,830	13,920	15,330
Luxembourg	14,780	17,700	21,350	12,920	15,370	21,500	12,900	13,860	14,960	12,600
Switzerland	16,440	15,420	21,300	14,530	14,970	20,760	14,460	..	..	..
Kuwait	18,540	22,880	19,520	14,630	13,530	21,080	14,610	..	..	..
Qatar	19,170	..	..	..	12,620	20,160	17,780	..	..	..
Brunei	20,980	..	..	..	13,370	23,960	15,190	..	..	..
United Arab Em.	24,540	24,050	26,470	..	26,610	20,370	20,340	..	..	..

.. = Not available

Note: The first section of the table provides three different per capita GNP estimates for 1983 based on GNY. Column 2 extrapolates 1975 per capita GNP in then-current US dollars to 1983 with a per capita GNY growth rate expressed in 1975 prices and US price changes (GNP deflator) from 1975 to 1983. Similarly, columns 3 and 4 are calculated by extrapolating 1980 and 1985 per capita GNP in current US dollars by the per capita GNY growth rate expressed in 1980 and 1985 prices, respectively, and adjusting each for US price changes between the benchmark and target years. Hence, in each case the figures allow for real growth and are inflated (or deflated) by the US inflation rate for the corresponding period, i.e. 1975-83, 1980-83, and 1985-83. The second trio of benchmark results (columns 5-7), shows per capita GNP estimates for 1983 using much the same technique, except that the growth rate of per capita GNP, rather than of per capita GNY, is used.

[1] Based on current data and methodology; actual FY84 classification was one class lower.

Source: World Bank, Socio-Economic Data Division.

ENVIRONMENT AND RESOURCE ACCOUNTING

1. Complex issues and inter-relationships associated directly or indirectly with the conventional system of national accounts are sometimes treated in separate "satellite" accounts linked with the SNA. Satellite accounts are a technique, developed in France, to portray important and more detailed aspects of sectoral behavior and inter-sectoral linkages, usually between economic and social activities. This technique has been adopted, for example, to analyze the education and health sectors. It helps illustrate what services are provided publicly and privately, and who uses them, usually by linking administrative data with household survey information.

2. The Expert Group for the Revision of the SNA has recommended that complex issues, such as the assessment of environmental degradation and the depletion (or discovery) of natural resources, with all their varying economic and social ramifications, be treated in a satellite system of data presentation linked to the SNA, at least for the time being. A more detailed investigation of environmental concerns, including resource depletion, can also be carried out within the proposed UN framework for environmental statistics. We agree with these proposals.

3. These satellite approaches, in telling a clearer and more expanded story, would, to a large extent, take care of important issues like so-called "defensive expenditures." These are costs incurred to protect the environment and to combat, either privately or at a collective, public level, those undesirable aspects of economic activity that lead to environmental decay, resource degradation and depletion, and pollution. At present, when defensive expenditures are incurred privately, they are treated as other costs and they are not normally part of GNP. The contribution to GNP of, say, a steel plant is equal to the value of the steel produced minus all costs incurred, whether to buy iron ore or to abate pollution. However, when pollution abatement or environmental protection is incurred publicly, it is deemed to contribute to GNP without any corresponding deduction having been made necessarily elsewhere.

4. Satellite accounts can also be developed to reveal more clearly how the exploitation, production, and sale of scarce subsoil and other non-renewable natural resources impinge on the broader, longer-term viability of an economy. The overall surpluses and distributable financial rewards determined by corporate accounting methods, which are officially incorporated into the subsequent statistical assessment of output, value added, and income in the national accounting context, may impart a false sense of security to countries involved in the production of exhaustible natural resources. Likewise, the discovery of new natural resources may have to be reflected as a positive improvement in a country's economic status and potential.

5. Prudent economic management requires that governments (and households) distinguish sharply their income from resources obtained through the reduction of their net wealth by sale, borrowing, or reductions in its volume and usability. Many feel it is important therefore that national income should as closely as possible reflect truly sustainable income. Satellite accounting systems may be used to reflect the economic impact of depletion/degradation of natural resources and public "defensive expenditures." While in practice the distinction may often be difficult or blurred, conceptually it is clear: raising this year's income does not, by itself, reduce prospects for future income; while raising the resources obtained through the reduction of finite net wealth clearly affects the amounts that can be so obtained in future.

6. Such issues arise partly as a result of taking a long-term perspective of the production process and a view beyond national geographic boundaries. But there is also an evident asymmetry in the SNA treatment of man-made assets and natural resources. Man-made assets, buildings and equipment, for example, are valued as productive assets and are written off against the value of production as they depreciate and thus deducted from net national product. Natural resources, which are also assets, are not so valued or at least, not adequately accounted for in most instances. This practice may sometimes confuse the sale of assets with the generation of income.

7. Accounting for the discovery and depletion of non-reproducible, exhaustible natural resources in the derivation of annual GDP or income is a highly compli-

cated question, even in theory. The issue of sustainability arises, at least partially, from the more limited time perspective conventionally taken in measuring income. In the case of natural resources, it is arguable that the SNA treats the sale of an asset as if it were value added created by the original factors of production. Thus, the calculated value added of these resource producing sectors, derived as a residual between the sale of the final output and the cost of the intermediate or basic inputs, will also reflect the scarcity value of the produced resource as well as the costs of bringing it to the point of sale in a marketable form. The economic rent derived from the production of the natural asset concerned can thus vary according to the actual and perceived scarcity of the asset, quite independent of the contributions made by the factors of production.

8. The justification for including resource values in GDP assessments rests, historically, on conventional standard accounting practices followed by enterprises and the widely accepted commercial assumption that, once discovered, goods "in the ground," like oil and copper, are "free gifts of nature." The implication of this, in effect, is that in total such stocks of natural assets are unlimited and that new stocks can always be tapped by incurring exploration and development expenses. When these latter are incurred by the producing entities themselves, they are deducted from NNP when they are amortized over time, and often even from GDP when they are "expensed". It is true that the new resources discovered through exploration have often exceeded the amounts used up worldwide. Known or assured reserves of most mineral resources have tended actually to grow over time. The economic value of certain natural resources, say, oil or coal, may well decline long before the resource itself runs out, worldwide and in a given country. However, one cannot be assured that this is always the case, particularly at the individual country level. Natural resources have become exhausted in specific countries, e.g., phosphate in Kiribati, before their economic value, worldwide, has disappeared. Consequently, GDP in these countries has fallen dramatically.

9. Two main conceptual approaches have been proposed to deal with the depletion/degradation of natural resources: the depreciation and the user cost approaches. The principle of depreciation of man-made capital could be applied straightforwardly to the consumption of renewable and non-renewable resources, but this may not be entirely satisfactory. Behind the user cost approach lies the notion that the net sales of a depletable resource can be split into a capital element, or user cost, and a value-added element, representing true income. The capital element represent real asset erosion, and so an equivalent amount from total income should be actually or hypothetically reinvested in other assets so that it continues to generate the same level of income after the resource has been exhausted.

10. Most production and consumption activities have some impact on the physical environment. As economic growth and population expansion have occurred, they have increasingly put pressure on the environment and the natural resource base. When the pressure was still small, years ago, there may have been some justification to make no reference to the contribution made by the environment to economic activities, both as a resource base and as a "waste sink," receiving the residues of the production and consumption process. But there is little justification for this now that output has expanded worldwide to such a significant level that it causes "externalities" that often lead to unexpected additional costs that are not borne by the producer and are not easily attributable to him.

11. An understanding is gradually gaining ground that, in many instances, the production process has done and is still doing enormous harm to the environment. Those "external" costs will eventually have to be borne by someone. The costs are definitely "internal" to the global system. At least at the global level, is it important to account properly for income and costs, and to distinguish clearly between true income generation and the drawing down of capital assets through resource depletion or degradation. As a matter of practical management of these costs, it would also be desirable as much as possible to internalize them, i.e., deduct them from the incomes of the country and producer responsible for them. However, to do so, in some cases related benefits would also have to be internalized first.

12. GDP, the most commonly used variant of aggregate income, is valuable mostly for indicating short- to medium-term changes in the level of economic activity, and is widely used for demand management an stabilization policies. However, as calculated at present, it may be less useful for gauging long-term sustainable growth, partly because there can be undesirable side effects of production that are not taken into account.

13. On the grounds of simplicity and continuity, the Expert Group for the Revision of the SNA seems likely to recommend the continuation of the conventional treatment presently recognized internationally (but with a reminder to users to be more conscious and explicit about the shortcomings). However, as indicated above, the construction of separate satellite tables will be proposed as the main method for deriving a measure that more closely approximates sustainable income. To move toward such a satellite system, the UN has drafted a separate Framework for Environmental Accounting, which is currently under review (the Bank, UNEP, and UNSO are involved in these discussions) and this should provide a more satisfactory basis for accounting for environmental issues.

Annex 3

THE INTERNATIONAL COMPARISON PROJECT

1. As in the case of adjusting value series for price changes over time to determine real GNP or the underlying real physical quantity movements, the rationale for defining a similar standard basis for making international comparisons of quantity aggregates is compelling.

2. The theory, as it has been developed for the International Comparison Project (ICP), focuses on the derivation of appropriate purchasing power parity (PPP) measures to convert national accounts aggregates measured in national currencies into a common unit of account to facilitate comparisons on a uniform basis. A brief history of ICP is given in Box A3.1. In providing a consistent relative price statement as a reference standard, the conversion of GNP aggregates (and their various subcomponents) by calculated PPPs permits a better understanding of the income levels of countries, according to their relative command over actual goods and services. By the same token, the approach provides a more rational basis for weighting national growth rates for regional comparisons. PPPs, being the rates of exchange that equalize the purchasing powers of different currencies, also serve as a basis for analyzing differences in internal relative prices between countries.

3. The use of PPPs to adjust GNP data leads to figures of the volume of goods and services available in an economy. For analysis of real differences in the composition of national expenditures, particularly for comparisons between countries within a region, it is preferable to use PPPs for some purposes.

4. However, ICP methodology is such that different PPPs obtain depending on how one responds to various methodological issues. In practice, country rankings will vary with the PPP methodology adopted. This appendix considers the main conceptual issues as well as some more pragmatic aspects of the exercise that may have to gel before a consensus can develop that some unique set of PPP calculations is not only valid but also applicable in the analytical and operational context of Bank work.

Methodological Issues

5. With the completion of new rounds of the ICP, new theoretical and practical problems appeared and some old ones seemed no nearer solution. Many of these problems are highly technical, in particular those that relate to choices between different types of aggregation procedures and index numbers. There are continuing debates as to which ICP methodology is most consistent with the national accounts. The aggregation procedures used and the level at which aggregation occurs influence the measured real economic relationships between two (or more) countries, i.e., the proportionality is not stable. All methods may tend to generate similar results if *the same set of prices* is used. However, the choice of the set of prices and linking procedures to be used (bilateral, linked multilateral, or extended multilateral averages) bears strongly on the result.

6. The basic approach of the ICP is to calculate "real" quantities (Q) on the basis of estimated expenditure values (V) divided by the relevant reported national prices (P) and to revalue all such derived quantities of goods and services at a common set of "average international prices" (IP) based on the countries involved in the particular comparison. The derived measure (Q x IP) is deemed to represent an internationally comparable real economic value or "volume." However, how "true" the "Q" obtained from "V/P" is depends on several considerations, in particular, on the ability to overcome differences in the types of goods present in each country and on the ability to compensate for differences in quality, including style (fashion), which affect "P" and basic price collection issues.

7. Some products are not present in every country. Therefore, one must decide how to compare the prices of bundles of goods containing different products: e.g., the price of a fruit basket containing (apples, pears, and oranges) with that of other baskets containing, respectively, (apples, pears, and plums), (plums, pears, and melons), and (plums, melons, and mangoes). Moreover, while price comparisons must be based on precisely defined types of products (e.g., French bread of a certain weight and cotton shirts of a certain fineness and size), national accounts data

correspond only to much broader categories, and therefore do not provide adequate guidance in determining the weights to be attributed to specific products. A related problem is that of differences in the representativeness of given products. Packaged, sliced bread is available in France, but a relatively scarce luxury, while the same is true of freshly baked French baguettes in the U.S. To overcome these problems, the 1980 and 1985 ICP studies use the respective country "characteristic product" price comparison approach. This handles differences in the availability of goods in various countries by means of an implied weighting procedure.

8. There are two main methods for calculating transitive purchasing power parities at the group heading level (e.g., "fruit") when some of the item prices are missing. The CPD ("country-product dummy") method uses a regression technique to estimate the group average based on all available observations; the EKS (Elteto-Koves-Szulc) method does the same thing through a series of weighted binary comparisons. When all data are available, the two methods generate identical results. Data imperfections will affect the two techniques differently but in practice the results appear similar at very high levels of aggregation whichever technique is used, according to available data.

9. Other less technical but no less complex issues relate to the comparison of qualities. Within a country, if the quality and the value of some products or services increase jointly over time, this is reflected in the national accounts as an increase in the volume, i.e., the quantity of production. For goods and certain services, ICP strives, in principle, to make similar allowances in international comparisons. As far as goods proper are concerned, ICP practice seems to have evolved towards increasingly taking

Box A3.1: The International Comparison Project: an historical perspective

In 1968, Professor Irving B. Kravis of the University of Pennsylvania secured some funding from the US National Science Foundation to start the International Comparison Project (ICP). The purpose of the project was to develop a system of comparing national accounts aggregates of different countries by converting them to a common numeraire currency on the basis of purchasing powers of currencies in domestic markets rather than exchange rates. Building on his experience in similar work in the fifties at the then OEEC with Milton Gilbert, Kravis in collaboration with his colleagues, Robert Summers and Alan Heston sought to develop a system which could be applied to all countries of the world irrespective of their economic system (socialism or capitalism) or geographical location. The proposal was to develop the system in several phases, initially concentrating on methods and gradually refining them as they were applied to an increasing number of countries. The work began at the University of Pennsylvania and, after the research phase was over, it moved to the United Nations for implementation. The World Bank liked the proposal and funded the ICP right from the start. Not only did the World Bank provide own research money but it also gave it a stamp of approval and secured funding for the project from other countries and organizations.

The ICP has now more or less completed five phases. Phase I concentrated on methods. It worked with data for ten countries and adopted a system that was multilateral rather than binary, with results that were transitive and independent of the base country chosen. Phases II and III extended the coverage to sixteen and thirty-four countries respectively with some refinements in comparing services. After Phase III, which was completed in 1982, the project moved to the United Nations.

Phase IV introduced a radical change in methods. In response to demand, a two stage system was adopted in which countries were first compared within a regional setting and then the "regions" linked to form a global comparison in a manner that retained the relative positions of the countries in their own groups. From Phase IV, the EEC became the main organizer and financier of ICP, with the OECD providing additional technical support. Phase V introduced some further refinements to this regionalization process which is expected to continue in Phase VI for 1990.

Major World Bank funding for the project ceased in 1982, but the Bank retains an interest in the project and has continued to provide technical advice and support as well as supplementary funding in special areas. It has also provided research funds for ICP related studies.

into account quality differences. Nevertheless, problems remain, particularly for products where brand names and "fashions" are important. (Is a sturdy pair of blue jeans made in India closer to a sturdy Levi or to an equally sturdy but much more expensive Calvin Klein? How to compare the two qualities of mutton, "with bones" and "boneless" sold in rural African markets, to the many grades of chops, legs of lamb, and shoulders, sold in high-income countries?) The answers to such questions can mean differences of several hundred percent in the volumes imputed to certain products and for products whose qualities are truly very different.

10. Even more difficult quality comparison issues arise for services. How do the annual services rendered by an Indian and an American physician or teacher compare? What about general administrators? Answers to such inherently difficult questions determine overall PPPs.

11. For certain purposes, an average international price needs to be calculated. Hitherto, this was weighted by the "real" (i.e. PPP-adjusted) incomes of the participating countries. The difficulty is that, to calculate the incomes, the PPPs, i.e. the international price, needs to be known. Price and incomes have been calculated simultaneously by the method developed by Geary and Khamis. Recently, this method has been criticized on technical grounds, and there is some question of replacing it.

12. Beyond these issues, two problems dominate and form, together with the inadequate coverage of developing countries, the principal obstacles to the operational use of ICP-generated data by the Bank, and even to their widespread analytical use in international comparisons. One is the lack of consistency of findings between different phases of ICP. The other problem relates to intercountry relationships within each phase, bound up in the issues of international transitivity and fixity.

The Consistency of Quinquennial Benchmark Findings

13. Rounds of ICP (called *Phases*) take place every five years; they constitute benchmarks. Annual price data can, in principle, be derived from these benchmarks if the international price of each category of GDP is multiplied by the price index denoting its evolution over time. In this fashion, the international price index corresponding to each component of GDP can be estimated for each of the years intervening between ICP benchmark years. These indices can then be multiplied by the value of each component of GDP in those years, and yield an estimate of these components (and of their sum, total GDP), at international prices. Other techniques can be adopted to achieve the same objective with more or less similar results.

14. The same procedure can, of course, be performed forwards or backwards. One can derive from ICP IV data for 1980, and from national accounts information on values and implicit price indices relating to other years, the prices and volumes of GDP components and of total GDP for both 1983 and 1979, for example. Similarly, one can derive separate estimates of, say, 1983 GDP at international prices from Phase III ICP data for 1975 and Phase V data for 1985.

15. Because of index number problems relating to growth rates, the estimates for 1983 based on Phase III, IV and V benchmark values cannot be expected to be identical. However, they should be reasonably close. In fact, however, for certain countries they have proven to be substantially different. In certain cases the ratios between volumes of per capita GDP, and even their ranking, are substantially different depending on the choice of base reference study.

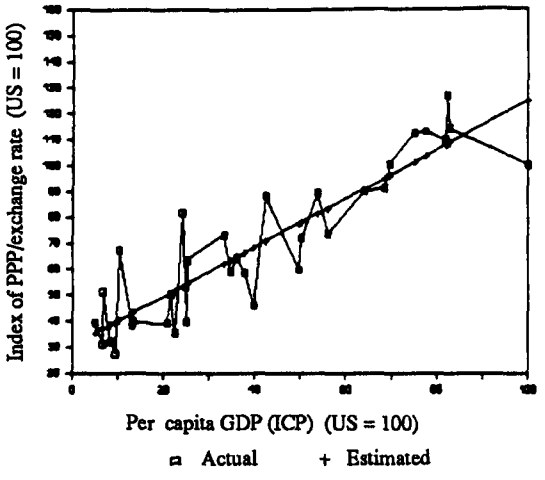
16. Some of these differences can be explained in light of the methodological evolution of ICP; in particular, the improved treatment of quality differences. Other causes, however, are not well understood. Clearly, a methodology that is supposed to establish the relationships of the volumes of the GDPs of various countries, i.e., to correct for price differences, should yield, for any given year, similar results independent of the choice of the particular benchmark year used for the calculation. This is certainly necessary if ICP results are to be used for operational purposes in preference to using exchange rate conversion methods. But even for many analytical purposes the data are credible and usable only if they are reasonably independent of the choice of the benchmark year. ICP has yet to meet this test.

17. The basic index number problem ensures that the estimates based on different base years will never completely converge. However, as ICP methods improve, and theoretical choices stabilize, this problem should gradually be eased. Without ever becoming identical, the annual data obtained by extrapolating forward past benchmark results can be expected gradually to converge with those obtained by extrapolating backwards subsequent benchmark results. For this progress to occur, it is of course necessary to make careful and consistent choices based on a stable methodology, but these conditions can be expected to be established.

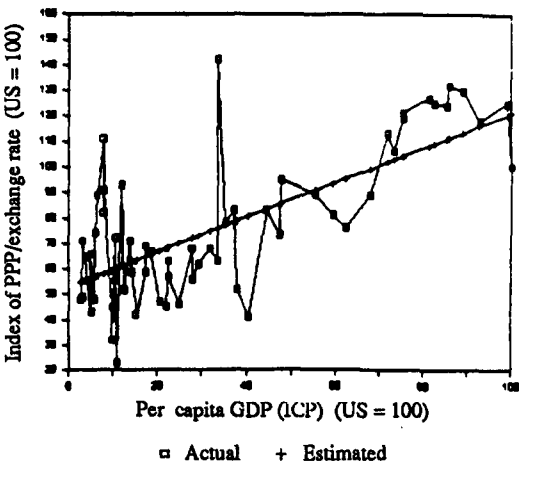
18. Variations from one benchmark phase to the next have deeper implications too. The negative relationship established by early ICP phases between income levels and price levels (ratio between PPP and exchange rate) was deemed to be due to differences in the productivity be-

Box A3.2: Ratio of PPP to exchange rate related to per capita GDP

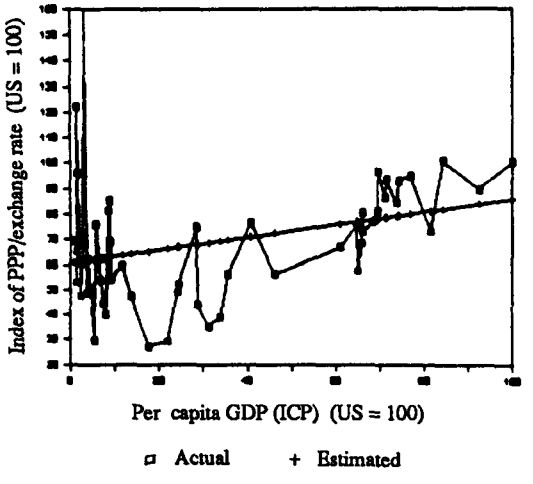
ICP Phase III, 1975



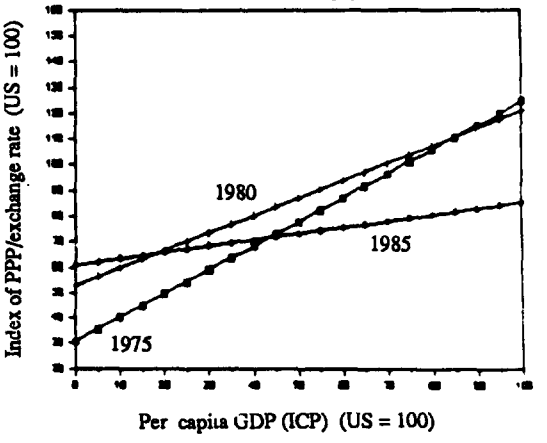
ICP Phase IV, 1980



ICP Phase V, 1985



Regression Lines: 1975, 1980 & 1985



tween tradeables and non-tradeables. Earlier shortcut methods used this relationship to estimate data for countries not covered by ICP. However, a shift in the nature of this relationship from ICP III to ICP V (see Box A3.2) and the reduced strength of the relationship within each new phase has made earlier shortcut methods obsolete and have led researchers to look for alternatives.

Transitivity and Fixity: The Relationship between Methodology and Country Rankings

19. The joint problems of transitivity and fixity are inherent to the index number problem. Transitivity is a desirable property of data relationships. It requires that comparisons between two countries should yield the same result, whether made directly, or indirectly through joint comparison with one or several other countries. If the GDP of country A is twice as high as that of country B, and that of country B is 20 percent higher then that of country C, then the GDP of Country C should be about 41 percent of country A's [if A=2B, B=1.2C, then A=2.4 C].

20. In early rounds of ICP, transitivity was easily obtained by the use of a single set of international prices based on a weighted average of all participating countries. However, the relationship between any two countries could change with the introduction of more countries in the set. In Phase III, the relationships between per capita GDP's of ten member countries of the European Communities (EC) were found to be significantly different, in a separate study of EC countries, from those obtained for the same countries from a global comparison of 34 countries. Not only were the ratios different; the country with the highest income within the EC comparison was not the highest income European country within the global comparison.

21. Subsequent rounds of the ICP have moved to a two-stage comparison focussing first on intra-regional comparisons (EC 10 and 12, Central Europe, other OECD, Asia, Latin America, Africa) which are then linked to each other via bilateral comparisons of "core countries" (e.g., Austria links Central Europe to the EC via Germany, and Japan links Asian countries to the OECD) in a manner that retains relationships from the regional comparisons even in global comparisons.

22. Some countries belong to several "regional" groups. For instance, Austria and Finland both belong to the Central European group as well as to the overall European and OECD groups. It has been decided that the publications giving the results of the global comparison and those giving the results of the OECD-wide comparison, should show the relative positions of these two countries only within the OECD comparison; the global comparison, therefore, maintains the fixity of the intra-OECD ranking. However, the separate publication of the European comparison retains the relative positions within the Central European group, and these are significantly different, Finland being somewhat above Austria at OECD prices, but below Austria in European prices.

23. In the *published* results for other regional groupings and overall international comparisons, procedures were adopted to maintain, within the international comparisons, the same rank orderings and real GDP relationships that had been observed in the separate regional studies. Thus, in 1980, the relationship of Tanzania's GDP to that of Zimbabwe was 0.40, whether the UN International (60 country) or the European Communities Regional African (17 country) estimates are taken. This is because the regional 'fixity' was observed in producing the more generalized world results. Had an average international price system been adopted, the results would have been different.

24. Thus, the published relationship of overall and per capita GDPs is that prevailing *within* certain country groups on the basis of the weighted average of prices prevailing within these country groups. Full adherence to this approach, however, would prevent many interesting comparisons *between* groups. Therefore, a different procedure was adopted for calculating detailed category-wise expenditures; to evaluate these, a single set of weighted international prices (calculated by the Geary-Khamis method) has been used. This has the advantage that category-wise expenditures (e.g., food expenditures) are valued at the same set of prices in all countries; if it were not so, the data would not allow meaningful comparisons of, say, food consumption, to be made between countries of different regions. However, this means that the sum of expenditures for a given country, valued at global international prices, will not equal its GDP, which is valued at regional prices.

25. The solutions adopted no doubt constitute a reasonable compromise between conflicting goals:

- allowing bilateral rankings of GDP to be made on the basis of bilateral data only, uninfluenced by prices and consumption patterns prevailing in third countries (bilateral fixity);
- allowing the same thing within groups of countries maintaining special relationships (the European Communities OECD, the Asian region, etc.); (groupwise fixity);

- allowing a comparison of overall GDPs between groups;
- allowing category-wise comparisons between and within groups; and
- allowing GDP to equal the sum total of its components (additivity).

26. As in all compromises, some of these goals had to be sacrificed. Bilateral fixity was sacrificed to group-wise fixity. Additivity was sacrificed to the goals of fixity and category-wise comparability.

27. These problems, and the solutions given to them, are sketched out here in their broadest outlines only. What they illustrate is that even when the coverage of ICP improves, complex methodological choices will continue to influence the relationships and rankings of GDPs (and other comparative information) indicated by the data. Bilateral comparisons provide the most acceptable relationship between two countries. They could be linked together, but then transivity would not be assured; the direct comparison of two countries would not yield the same result as the indirect comparison of their relationship to a third.

28. When countries are far apart in income levels, they can be ranked without careful statistical investigation. Such careful evaluations are needed only when one wishes to compare with each other (and perhaps to pre-determined benchmark levels), countries whose positions are so close to each other that they cannot be distinguished readily. Yet, the ICP approach has not assured us of a way to do this fully objectively, as the ICP rankings of such countries are dependent on choices between different methods. The problems of the ICP approach are inherent to basic index number problems, and they should not preclude increased use of the method for a variety of analytical processes. However, the highly technical nature of the choices, their lack of transparency to non-specialists, and above all the possibility that different but equally valid choices might yield significantly different results, all this is likely to constitute a serious obstacle to the adoption of the ICP methodology for operational decisions. Comparisons based on exchange rate conversion avoid the index number problem though at the cost of not correcting for price differences, nor therefore for the quantity differences which may lie behind identical values.

29. ICP work is costly, and absorbs resources also needed in other areas of statistical enquiry, particularly in developing countries which see little relevance of ICP to domestic policy decisions. Preferably, ICP research should be more closely integrated into regular statistical work on national accounting and domestic price indices. This would both reduce its costs and increase the priority likely to be attached to it by developing country governments facing acute budget constraints. The Bank should continue to support ICP related research in a modest way. It should also continue to advise member countries that participation in ICP is beneficial over the long run. Such ICP work is already shedding some valuable light on intercountry differences between price structure and consumption problems. Once it gets into more general use, it should help mostly to explore the relationship between related expenditures and concrete results: for instance, the relationship between the "volume" of education expenditures and achievements, of health expenditures and indicators like infant mortality.

Annex 4

THE SEARCH FOR BETTER CONVERSION FACTORS

1. Economic analyses are often based on imperfect concepts, approximately applied and inadequately measured. The search for an all-encompassing concept or the perfect measure is without end. When domestic aggregation is at all meaningful, some of the domestic economies' international links will always have to be examined in light of a rate reflecting the relative scarcity of internationally traded goods. The official foreign exchange rate generally provides an acceptable approximation to this.

2. If free trade, competitive conditions, and stable exchange rates prevailed, and transport costs were relatively low, comparing or aggregating national accounts internationally, by converting them at prevailing exchange rates, would not be conceptually different from the compilation of national accounts within a country, or their comparison between regions. Under these ideal conditions, the market value of each product corresponds to its marginal cost, to the marginal cost of the factors embodied in it, and to the marginal utility it brings to its users. Throughout the economy, a dollar's worth of any product can, at the margin, be transformed into a dollar's worth of any other product, and substitute for it, both from the point of view of producers and of users. Market values correspond to marginal transformation rates and to marginal substitution rates. This is what justifies their use for aggregation and comparisons.

3. Under such ideal conditions an economy would need to give up one dollar's worth of its products in order to acquire one dollar's worth of the other economy's products. Its overall consumer satisfaction would then stay constant if in order to import a dollar's worth of cloth it had to export a dollar's worth of, say, wheat; and to produce the additional wheat, it might have to switch resources from another sector and thus reduce its production and use of some nontraded goods by one dollar.

4. Under such conditions (and with no transportation costs), converting national currency data at official exchange rates reflects the degree of command of a given economy over world resources, both in aggregate and in per capita terms. It also properly represents the relationship of the domestic economy to its international linkages: the burden of foreign debt or the share of foreign trade relative to GNP, for instance. Many domestic, internal relationships, e.g., the taxation rate, or the share of government, or the overall savings rate can also be well understood at such market prices.

5. As soon as one departs from these ideal conditions, none of these relationships and aggregations is perfectly maintained. Indirect taxes cause the marginal transformation rates of producers to differ from the marginal substitution rates of consumers; quantitative restraints on trade enhance such differences. At the limit, in a command economy, where willingness to pay a price does not suffice for a transaction, the very notions of "income" and "price" are less than meaningful. Nevertheless, one has come to accept the market imperfections of most economies, and to use national accounting concepts to measure activities, even when these concepts do not fully capture the extent of economic activities.

6. Imperfections are much greater in international markets. There is no present alternative to exchange rate conversion for operational comparisons. Nevertheless, for lack of a better method, official exchange rates are generally close enough to the rate at which foreign transactions actually take place to constitute acceptable proxies for most purposes. For instance, the ratio of foreign debt or interest payments to GDP, converted at official exchange rates are usually considered to be meaningful measures of the burden of debt or the effort required to service it.

7. Yet as trade becomes less free, as the official exchange rate is less and less closely related to the rate at which international transactions actually take place, e.g., because of tariffs and quotas, the official exchange rate moves farther away from being a reasonable approximation to the transformation rate of domestic values into foreign values. The point comes when the difference between the official exchange rate and the rates effectively applied to foreign transactions becomes so large as to render quite meaningless any conversion based directly on

the official rate. In these egregious cases, an alternative conversion factor can sometimes be meaningfully estimated (during FY85-89, such conversion factors have been estimated for about six countries per year, see BoxA4.1.) Such alternatives also permit more meaningful calculations, *inter alia*, of the burden of foreign debt and the share of foreign trade, as well as of intercountry comparisons. In the case of full command economies and, in general, when imports are highly but unevenly restricted, no simple conversion factor may be fully meaningful.

8. For analysis, full use must be made of all measurements and methods of comparison now available, and others must be developed through further research. ICP sheds valuable light on the comparative structures of domestic absorption in a complementary manner. One should continue to pursue research into potential uses for it, as well as research into methods that would allow to reduce its costs and to integrate it more into other statistical processes.

Box A4.1: Countries with conversion factors estimated by IECSE for *Atlas* per capita GNP

I. Countries for which the official exchange rate differed "egregiously" from the effective transactions rate, and the split conversion method was used.

FY85	*FY86*	*FY87*	*FY88*	*FY89*
Argentina	Bolivia	Bolivia	Bolivia	Somalia
Bolivia	Ghana	Ghana	Ghana	
Ghana	Somalia	Somalia	Somalia	
Guinea-Bissau	Uganda			
Somalia				
Uganda				

As trade and exchange systems have been liberalized, and real exchange rates have evolved in recent years, fewer and fewer countries' official exchange rates have differed "egregiously" from the effective transactions rate.

II Countries for which trade weighted conversion factors were estimated from officially recognized multiple exchange rates.

FY85	*FY86*	*FY87*	*FY88*	*FY89*
Ecuador	Dominican Rep	Dominican Rep.	Dominican Rep.	Ecuador
El Salvador	Ecuador	Ecuador	Ecuador	El Salvador
Egypt	El Salvador	El Salvador	El Salvador	Egypt
Jamaica	Egypt	Egypt	Egypt	Guatemala
Nicaragua	Jamaica	Guatemala	Guatemala	Nicaragua
Paraguay	Nicaragua	Jamaica	Nicaragua	Paraguay
Syria	Paraguay	Nicaragua	Paraguay	Syria
	Syria	Paraguay	Syria	
		Syria		

Annex 5

COUNTRY CLASSIFICATION:

INTERNATIONAL ORGANIZATION PRACTICES

1. Country classification is normally by listings, especially when institutional membership or geography is involved; or typology, when general analytical objectives are pursued. Some international organizations, such as the UN, emphasize listings or enumerative classifications. Others, notably the Bank and the Fund, combine enumeration and typology in their countries classification schemes. The distinction between enumerative and typological groupings is usually self-evident, but becomes blurred for very broadly defined categories. This point should be kept in mind when comparing what appear to be roughly equivalent country groupings reported by different international organizations (as in the accompanying table). It is also important to an understanding of the staff's proposal to deemphasize use of terms that appear to be typological, such as developing or developed countries, but in practice tend to be defined by enumeration.

2. Most international organizations make some distinction between developed or developing and industrial market economies. However, no organization attempts to support the distinction with objective criteria, and coverage tends to be defined historically. The distinction was once broadly correlated with levels of per capita income.

3. The country classifications used by major international organizations have basic similarities. There are some precise country groupings, notably those based on organizational membership; some with relatively clear geographic or analytical objectives, which are usually well documented, and a few that seem to remain for historical reasons but are rarely explained.

4. The Bank's *analytic* classification is based primarily on income. Economies are also grouped according to major exports (oil, manufactures), their external debt situation, and regions of special Bank development focus (Sub-Saharan Africa). The composition of groups based on per capita income is reviewed annually, and the composition of other analytic groups is reviewed every few years and revised according to evolving structural changes. The present Bank country classification scheme, and its evolution, is discussed more fully in IEC's Statistical Manual.

5. The Fund's analytic classification distinguishes between countries grouped by: (1) predominant exports, (2) financial criteria, (3) other criteria, and (4) former classification criteria. Classification in the Fund's *IFS* is regional; that used in the *World Economic Outlook* (*WEO*) is reviewed frequently and revised as countries' economies and financial situations change. Bank and Fund staff continue to develop ways to harmonize country classification schemes; it is understood that Fund staff are currently reconsidering their country groups.

6. The United Nations Statistical Office (UNSO) and the UN Conference on Trade and Development (UNCTAD) classification schemes are virtually identical. UNIDO (not shown in the attached table) follows the same basic classification scheme but further subdivides developing economies into three income groups on the basis of their 1978 per capita GDP. Developing countries in the high income group range from Chile to Kuwait. The classification of the UNSO and UNCTAD has remained quite stable over the years since only partial weight is given to income changes. The Least-Developed group, as classified by the UN General Assembly for example, entails criteria such as proportion of population in the subsistence sector, population growth, and agricultural productivity. The General Agreement on Trade and Tariffs (GATT) classification is also similar to that of UNSO.

Table A5.1: Country classifications of World Bank and other international organizations

World Bank[1]	*IMF*	*UN Statistical Office*	*UNCTAD*	*GATT*
Industrial Market Economies	*Industrial Countries*	*Developed Market Economies*	*Developed Market Economies*	*Developed Countries*
OECD[2] (excluding Greece, Portugal, and Turkey)	North America Canada USA	North America Canada USA	North America Canada USA	North America Canada USA
	Europe European Communites[2] (excluding Greece and Portugal) EFTA[2]	Europe European Communities[2] EFTA[2]	Europe European Communites[2] EFTA[2]	Europe European Communities[2] EFTA[2] Gibraltar Malta Turkey Yugoslavia
		Other Europe Faeroe Isl. Gibraltar Malta	Other Europe Faeroe Isl. Gibraltar	
		Africa South Africa	Africa South Africa	Africa South Africa
	Asia Japan	Asia Israel Japan	Asia Israel Japan	Asia Japan
	Oceania Australia New Zealand	Oceania Australia New Zealand	Oceania Australia New Zealand	Oceania Australia New Zealand
Developing Economies	*Developing Countries*	*Developing Market Economies*	*Developing Market Economies*	*Developing Areas*
Latin America and Caribbean	Western Hemisphere	America LAIA[2] CACM[2] Other (including Cuba)	America LAIA[2] CACM[2] CARICOM[2] Other	Latin America
Europe (including Cyprus, Yugoslavia, Greece, Portugal, Turkey, Malta, Hungary, Poland, and Romania)	Europe	Europe Yugoslavia	Europe Yugoslavia Malta	
Middle East and North Africa Sub-Saharan Africa South Asia East Asia	Africa (including South Africa)	Africa North Other CEUCA[2] ECOWAS[2] Rest of Africa (excl. South Africa)	Africa North Other CEUCA[2] ECOWAS[2] CEPGL[2] Other (excl. South Africa)	Africa (excluding South Africa)
	Asia (excluding "Middle East" but including Oceania)	Asia Asia Middle East Other Asia Oceania	Asia West South and South-East Oceania	Middle East and Asia (excluding Japan, China, and other Asian CPEs)
High-Income Oil Exporters	Middle East (including "high-income oil exporters")	OPEC[2]	Major petroleum exporters[3]	
Nonreporting Nonmembers	*USSR and Other Nonmembers n.i.e.*	*Centrally Planned Economies* Asia (including China) Europe and USSR (including Hungary, Poland, and Romania)	*Socialist Countries* Asia Eastern Europe (including Hungary, Poland, and Romania)	*Eastern Trading Area* China and Other Asian CPEs Eastern Europe and USSR (including Hungary, Poland, and Romania)
Other Analytical Groups				
Developing Economies	*Developing Countries*	*Developing Countries*	*Developing Countries*	
Low-income China and India Other low-income Middle-income Lower middle-income Upper middle-income	Small low-income countries[6]	Least developed countries[4]	Least developed countries[5] Major exporters of manufactures[9] Income groups [5]	
Oil exporters[1] Exporters of manufactures[1] Highly indebted countries[1] Sub-Saharan Africa[1]	Oil exporting countries[7] Exporters of manufactures[8] Fifteen heavily indebted countries[10] Sub-Saharan Africa[11]			

1. See *World Development Report* 1988, page xi, for details.
2. See the Fund's Directory of Regional Economic Organizations and Intergovernmental Commodity and Development Organizations for details.
3. High-income and developing oil exporters excluding Cameroon.
4. Other low income excluding Burma, Ghana, Kenya, Madagascar, Mozambique, Pakistan, Senegal, Sri Lanka, Viet Nam, Zaire, and Zambia, and including Botswana, Kiribati, Tuvalu, Vanuatu, Western Samoa, Yemen Arab Republic, and Yemen PDR.
5. 1980 per capita GDP: above $1,500, between $500 and $1,500, below $500.
6. Fund member countries whose per capita GDP, as estimated by the World Bank, did not exceed the equivalent of $410 in 1980 (excluding China and India).
7. High income developing oil exporters, and Libya, excluding Bahrain, Brunei, Cameroon, Congo, Ecuador, Egypt, Gabon, Mexico, Syria, and Trinidad and Tobago.
8. Exporters of manufactures and Turkey, excluding Brazil and Portugal.
9. Exporters of manufactures and Argentina, excluding China, Hungary, India, Israel, Poland, Portugal, and Romania.
10. Highly indebted countries, excluding Costa Rica and Jamaica.
11. Sub-Saharan Africa excluding Nigeria.

Box A5.1: Operational guidelines and country classification

Operational guidelines FY88	*Threshold level 1986 per capita GNP (US$)*	*1988 WDR/WDI Per capita GNP , 1986 (partial listing)*	
• Civil works preference	less than $425 [1]	**Low-income**	
• IDA eligibility and 20-year IBRD terms	$426 -$835 [2]	**Middle-income** Lower middle-income	
• 17-year IBRD terms	$836 -$1,725 [3]		
		Upper middle-income	
• IBRD graduation	more than $3,010 [4]	Israel	6,210 [5]
		Singapore	7,410 [5]
		Hong Kong	6,910 [5]
		High-income oil exporters	
		Libya	5,500 [6]
		Saudi Arabia	6,950 [6]
		Bahrain	8,510
		Qatar	3,200
		Kuwait	13,890
		UAE	14,680
		Brunei	15,400
		Industrial economies	
		Spain	4,860
		Ireland	5,070

Threshold level 1987 per capita GNP (US$)

FY89 operational guidelines are as follows:

1. Less than $480.
2. $481-$940.
3. $941-$1,940.
4. More than $3,385.

5. 1987 per capita GNP: Israel – $6,810; Singapore – $7,940; Hong Kong – $6,910.
6. 1987 per capita GNP: Libya – $5,500; Saudi Arabia – $6,200 (est.).

Note: Per capita GNP is the main classification criterion for the operational guidelines and the WDR/WDI. The four operational guidelines lending categories correspond to the WDR/WDI classification for low-income, lower middle-income, and upper middle-income (shown above). High-income countries are not Bank borrowers, so there is no corresponding guideline threshold level. In future, a single high-income category will be presented in the WDR.

Box A5.2: Changes in lending categories:
FY89 operational guidelines (SecM88-1028)

In FY89, fifteen countries moved from one lending category to another; (two moved to harder term categories and thirteen moved to softer term categories) based on 1987 per capita GNP[1]. These changes, and the percentage above or below the new threshold level are shown below (ranked by percentage above or below the threshold).

Country	*Lending category FY88*	*Lending category FY89*	*1987 per capita GNP (US$)*	*Threshhold FY89 (US$)*	*Percentage above/below threshold*
Uruguay	III	IV	2,160	1,941	11
Senegal	I	II	510	481	6
Guatemala	III	II	940	940	0
Poland	IV	III	1,920	1,940	-1
Mexico	IV	III	1,820	1,940	-6
Indonesia	II	I	450	480	-6
Congo P. R.	III	II	880	940	-6
Malaysia	IV	III	1,790	1,940	-8
Liberia	II	I	440	480	-8
Solomon Is	II	I	420	480	-13
Yemen PDR	II	I	420	480	-13
Gabon	V	IV	2,750	3,385	-19
Guyana	II	I	380	480	-21
Fiji	IV	III	1,510	1,940	-22
Nigeria	II	I	370	480	-23

1. *Lending categories are:* I – Civil Works Preference; II – IDA Eligibility and 20-Year IBRD Terms; III – 17-Year IBRD Eligibility; IV – 15-Year IBRD Terms; V – IBRD Graduation.

Box A5.3: GNP per capita, 1987

***Atlas* methodology**

Country or territory	GNP per capita (US) 1987
Low-Income	
Ethiopia	120
Bhutan	150
Chad	150
Mozambique	150
Zaire	150
Bangladesh	160
Guinea-Bissau	160
Lao, PDR	160
Nepal	160
Malawi	180
Burkina Faso	200
Madagascar	200
Mali	210
Gambia, The	220
Tanzania	220
Burundi	250
Zambia	250
Niger	260
Uganda	260
São Tomé and Principe	280
China	290
Somalia	290
Togo	290
Benin	300
India	300
Maldives	300
Rwanda	300
Sierra Leone	310
Central African Republic	330
Kenya	330
Sudan	330
Pakistan	350
Haiti	360
Comoros	370
Lesotho	370
Nigeria	370
Guyana	380
Ghana	390
Sri Lanka	400
Solomon Islands	420
Yemen, PDR	420
Mauritania	440
Indonesia	450
Liberia	450
Kiribati	480

Country or territory	GNP per capita (US) 1987
Middle-Income	
Cape Verde	500
Senegal	510
Western Samoa	560
Bolivia	570
Philippines	590
Yemen Arab Republic	590
Zimbabwe	590
Morocco	620
Swaziland	700
Egypt, Arab Republic of	710
Tonga	720
Dominican Republic	730
Papua New Guinea	730
Côte d'Ivoire	750
Honduras	810
Nicaragua	830
Thailand	840
El Salvador	850
Congo, People's Republic	870
Guatemala	950
Cameroon	960
Jamaica	960
Paraguay	990
Botswana	1,030
Ecuador	1,040
St. Vincent	1,070
Turkey	1,200
Tunisia	1,210
Colombia	1,230
Belize	1,250
Chile	1,310
Grenada	1,340
St. Lucia	1,400
Peru	1,430
Dominica	1,440
Mauritius	1,460
Jordan	1,540
Costa Rica	1,550
Fiji	1,580
St. Kitts and Nevis	1,700
Malaysia	1,810
Mexico	1,820
Syrian Arab Republic	1,820
South Africa	1,890
Poland	1,920
Brazil	2,020
Uruguay	2,160
Hungary	2,240
Panama	2,240
Argentina	2,370
Suriname	2,370
Yugoslavia	2,480
Antigua and Barbuda	2,570
Algeria	2,680
Korea, Republic of	2,690
Gabon	2,760
Portugal	2,810
Seychelles	2,990
Venezuela	3,230
Malta	4,020
Trinidad and Tobago	4,220
Greece	4,350
Cyprus	5,210
Barbados	5,350
Libya	5,500
Puerto Rico	5,520
Oman	5,830

Country or territory	GNP per capita (US) 1987
High-Income	
Spain	6,010
Ireland	6,030
Saudi Arabia	6,200
Israel	6,810
Singapore	7,940
New Zealand	8,230
Hong Kong[1]	8,260
Bahrain[2]	8,510
Greenland[2]	8,780
Virgin Islands (U.S.)[1,2]	9,760
Bahamas	10,320
Italy	10,420
United Kingdom	10,430
Australia	10,900
Belgium	11,360
Netherlands	11,860
Faeroe Islands[2]	11,930
Austria	11,970
Qatar	12,360
France	12,860
Finland	14,370
Germany, Federal Republic	14,460
Kuwait	14,870
Denmark	15,010
Canada	15,080
Brunei[1,2]	15,390
Sweden	15,690
Japan	15,770
United Arab Emirates	15,770
Luxembourg	15,860
Iceland	16,670
Norway	17,110
United States[2]	18,430
Bermuda	20,410
Switzerland	21,250

Data Not Available

Low-Income

Afghanistan
Burma
Equatorial Guinea
Guinea
Kampuchea, Dem.
Vanuatu
Viet Nam

Middle-Income

Albania
American Samoa
Angola
Bulgaria
Cuba
Czechoslovakia
Djibouti
Fed. States of Micronesia
French Guiana
Gibraltar
Guadeloupe
Guam
Iran, Islamic Republic
Iraq
Korea, Democratic Republic
Lebanon
Macao
Marshall Islands
Martinique
Mongolia
Namibia
Netherlands Antilles
New Caledonia
Reunion
Romania
USSR

High-Income

Aruba
Channel Islands
French Polynesia
German Democratic Republic
Isle of Man

[1] Refers to GDP per capita

[2] Data refer to 1986

PER CAPITA INCOME PAPER

Errata

1. Some curious typographical garbles appear in the last six lines of paragraph 42 of Annex 1 (page21). These lines should read:

> growth rate expressed in 1980 and 1985 prices, respectively, and adjusting each for US price changes between the benchmark and target years. Hence, in each case the figures allow for real growth and are inflated (or deflated) by the US inflation rate for the corresponding period, i.e. 1975-83, 1980-83, and 1985-83.

2. On page 8, paragraph 50 should refer to paragraphs 42-44, and paragraph 51 should refer to paragraphs 44-45.

3. On page 41, the footnote to United States should be attributed to Bermuda.

January 1989