

I. INTRODUCTION

A. Purpose of the Handbook

1. The purpose of this Handbook is to assist national statistical agencies in collecting basic data and organizing their work so as to enable them to participate in the International Comparison Programme (ICP). Over the nearly 25 years of the ICP, a large volume of written material and much practical experience has been accumulated; however, guidance to participating countries in the form of a handbook has not been available. The United Nations Statistical Commission, at its twenty-fifth session, in 1989, attached high priority to the preparation of a Handbook on the ICP. The Commission considered that, in spite of the impressive progress achieved in the theoretical and methodological work of international comparisons in the past two decades, those working in national statistical offices on the ICP had received only limited guidance, since detailed instructions on the work to be carried out were often lacking. To remedy that situation the Commission urged the Statistical Office of the United Nations Secretariat to make arrangements for preparing a handbook on the ICP as soon as possible.

2. The present Handbook relies extensively on country experience and operating procedures developed during earlier ICP work. There are extensive publications on methods and results of the ICP, ^{2/} as well as many unpublished working papers that are often more theoretically oriented than appropriate for a handbook to be utilized in the practical work of the ICP. The reference section of the Handbook cites the more theoretical references, and annex II contains a brief discussion of some methodological aspects of the ICP. However, the main body of the Handbook is practical in its orientation, focusing on those tasks that national statistical offices will need to carry out when participating in the ICP. Countries participate in the ICP directly through an organization such as the European Communities (EC), a regional group such as the Economic and Social Commission for Asia and the Pacific (ESCAP) or an intercontinental grouping, for example, the Organisation for Economic Cooperation and Development (OECD). The history and organization of the work associated with groups of countries, and the combined overall world comparison of the ICP are described in annex I.

3. The remaining sections of this chapter include a description of the international role of the ICP in terms of price and output statistics (section B); the basic ICP framework (section C); an outline of the basic data required from participating countries and its relation to national statistics (section D) and uses of the ICP results (section E). Chapter II shows the expenditure breakdown used in the ICP, while chapters III and IV treat the problem of item selection and price collection, including problems specific to particular expenditure groups. In chapter V, an outline of how the ICP data are processed is presented, with some methodological details provided in annex II.

B. The Place of the ICP in international statistics

4. The ICP produces internationally consistent price and quantity comparisons across countries for many of the components of and the total of gross domestic product (GDP) built up from detailed prices and expenditures. As discussed in section E below, these comparisons are useful for a variety of purposes. GDP, which represents the total of final expenditures of a country during a year, has been the focus of the ICP because it is the single measure most often used to represent the total economic size of countries, and on a per capita basis to represent the flow of goods and services available to countries to contribute to their economic well-being. The ICP generates its results on the basis of hundreds of item price comparisons for many detailed headings of expenditure on GDP.

5. The ICP is unique in that it requires both country statistical offices and international agencies to split responsibilities in compiling and processing the basic price and expenditure data. This sharing of work and exchange of information either between neighbouring countries at regional meetings or through ICP intermediaries requires more interaction than most international statistical programmes; however, these shared tasks have the benefit that countries learn the practices of other countries in some of the difficult areas of international statistics such as deflation of government services or imputing rent to owner-occupied dwellings.

6. Because some of the burden of averaging and weighting across countries is assumed by the secretariats of country groups, country statistical offices do not have to take on these tasks. All of the procedures of the ICP are discussed in this Handbook, but greater emphasis is given to those tasks that are the main concern of national statistical offices.

7. The draft revision of the System of National Accounts (SNA) discusses the ICP in the context of price and volume measures. National accounts statisticians generate deflators of various components of GDP and comparable real quantity or volume estimates over time. The ICP in essence is an attempt to extend national accounts so as to produce comparable price and volume estimates across countries. The benchmark ICP comparisons produce national accounts across participating countries that provide users consistent volume measures. In the phase V benchmark, for example, all national currency expenditures are expressed in a common currency unit (CCU), say 1985 dollars, at detailed and higher levels of aggregation. In terms of ICP terminology, there is a purchasing-power parity (PPP) between national currencies and the CCU that allows for the conversion of national currency expenditures to the CCU, permitting volume comparisons between countries. Related to the PPP is another concept, the national price level which expresses the PPP as a ratio to the exchange rate.

1. National Price levels and related concepts

8. Consider the following comparison for Japan and the United States for 1985 and 1988, taken from OECD National Accounts (1960-1989) (OECD, 1991), which illustrates several of the basic concepts of the ICP. The value for Japan is expressed in current dollars, converting current yen per capita GDP at exchange rates in column (1) and at PPPs in column (2), labelled nominal and real. Because the current United States dollar is the numeraire for the OECD countries, its GDP per capita is the same in both columns. In columns (3), (4) and (5), the exchange rates, PPP over GDP, and their ratio are provided. When national currency GDP is converted by PPPs, the result is referred to as real product or real output. The use of real as an adjective in international comparisons is to contrast it with conversions at exchange rates, termed nominal. This usage is similar to national practices calling constant price series real and current price series nominal.

Table 1. Aggregate ICP illustration

	<u>Per capita GDP</u>		<u>Exchange</u>		
	Nominal (1)	Real (2)	Rate (3)	PPP (4)	Price level (5)=(4)/(3)
Japan					
1985	10 981	11 805	238	222	0.933
1988	23 190	14 288	128	208	1.625
United States					
1985	16 581	16 581	1.0	1.0	1.0
1988	19 558	19 558	1.0	1.0	1.0
Japan/United States					
1985	0.662	0.712			
1988	1.186	0.73			

9. Table 1 illustrates how exchange rates can fluctuate from year to year without any necessary change in the relative purchasing power of the two currencies. It also shows how use of exchange rates as converters can produce implausible results, such as those in column (1) in the last two rows. At exchange rates, Japan is reported at 66.2 per cent of the United States per capita in 1985 and 118.6 per cent in 1988, during a period when Japan was growing only slightly faster than the United States. The more plausible and more stable comparison in column (2) is one of the principal advantages of using PPPs to convert national currency totals to a common currency.

10. Column (5) is termed the national price level of a country, and is simply the Japan/United States PPP divided by the yen/dollar exchange rate. Though not a common term, the national price level is a simple concept well understood by travellers, who often refer to countries as being expensive (a high national price level) or inexpensive to visit. In fact, historically, there have been many casual efforts to estimate PPPs precisely because so much interest attaches to how both relative prices and overall prices differ across countries.

11. The national price level allows one to compare the relative costs of the bundle of goods making up GDP between countries. For components of GDP such as investment, the term comparative price level is used. Since there are often large differences for countries between comparative price levels of various components of GDP and the national price level, this is a useful concept for many types of analysis. Two other useful price level concepts are country group price levels, as, for example, the price level of Africa or the EC relative to the numeraire, and within-country price levels (e.g., provincial, regional or urban). These concepts are further explained below in the discussion of international prices.

12. National price levels vary systematically, rising with the level of per capita GDP of countries. If the United States is the numeraire and its national price level is taken as 100, then it was found in the 1980 benchmark study that the price level for low-income countries was about 30 to 40, middle-income countries in the 50 to 80 range, and higher-income countries in the 80 to 140 range. Two countries that would be regarded in the middle and lower middle-income range, Argentina and Nigeria, both had national price levels in 1980 above 100. National price levels so far above the levels of similar countries immediately suggest unusual exchange rate policies, which was borne out by subsequent major depreciations of the currencies in both countries. Similarly, sharp movements of the national price level over time are usually a signal of important changes in the international position of a country. 3/

2. National accounts and the ICP

13. The systematic attempt to integrate PPP and real product comparisons with national accounts was only begun in the 1950s. Looking backwards, the ICP can be seen as a logical extension of the national accounts from current and constant price data in national currencies to an intercountry set of international accounts. In national accounts, the price deflators associated with obtaining constant price GDP and its components are of interest in themselves as a measure of temporal price movements. In the ICP, the PPPs allow us to convert national currency aggregates into a CCU allowing volume comparisons; the national price level, derived from the PPP, is the spatial deflator across countries, and like the GDP temporal deflator, is analytically interesting in and of itself.

14. It was noted above that at the operational level the ICP is different from other national accounts work for one fundamental reason. Country statistical offices can obtain constant price national accounts using price information of their choice to obtain deflators. However, for the ICP, country statistical offices must coordinate with other countries so that price comparisons across countries can be made for a comparable bundle of items. As will be discussed in chapter III, this is usually the most difficult task of the ICP.

15. In most countries, GDP can be obtained from expenditure, income or production-side estimates. The ICP may, in principle, include all three approaches to obtaining GDP, but the only operational choice is between the expenditure and production approaches. In fact, thus far the ICP has made all of its comparisons across countries by expenditure category breakdowns, that is, household consumption, government consumption, capital formation and net exports (i.e., exports minus imports). The alternative of breaking down gross domestic product by industrial categories, for example, value added produced by agriculture, mining, manufacturing etc. and their component sectors, is for many purposes more attractive. However, in general, comparability by industrial category is much lower than comparability by expenditure category, since production pattern differences among countries are generally much larger than final use (expenditure) differences. In addition, the preferred approach to the production side would require price comparisons for both final product and inputs (double deflation) for each industry breakdown, a much larger data demand than for comparisons from the expenditure side.

16. Despite these difficulties, there remains a strong interest on the part of various users for industrial category breakdown comparisons, especially for studies of growth and productivity. Several pioneer studies in this field (mostly using bilateral comparisons of product and productivity, restricted to some branches of activities) have already been carried out using different methodologies (Paige and Bombach, 1959). Although the ICP has not yet ventured into this difficult and costly field of the international comparison work, some researchers have reworked the final expenditure results to come up with an adjusted industry of output set of numbers reflecting purchasers values. A major research effort carried out at the University of Groningen by Maddison, Pilat and Van Ark has worked at obtaining PPPs for the production accounts at a fairly detailed level but has not made price comparisons for inputs. However, this project has provided a major stimulus for additional work on the production side.

17. While cooperation between countries for price comparison work has been emphasized in this introduction, it should also be made clear that countries have much to gain from one another in the comparison of expenditures. The expenditure framework of the ICP allows Governments to think more coherently about the overall consistency of their GDP expenditure estimates, particularly those relating to household consumption. Comparisons of the percentage distribution of consumer expenditures between countries immediately signals a country regarding the areas where their national accounts compilations may require review, especially when total consumption has been estimated as a residual. As discussed in chapter II, as countries work with regional coordinators, there is much sharing of information about how to make use of administrative records, household surveys and commodity flow information so as to break down residual expenditure groupings into meaningful detail.

C. The ICP Problem in outline

18. The PPP calculation can be conceived as a special price index computation, where the dimension of the comparison is space, instead of time. In other words, instead of comparing the prices of two time periods (in a given country) the prices of two countries (in a given period) are compared. Consider two countries, A, the numeraire, and B. For a given item, we can write the ratio of the national currency expenditures on the item of the two countries as,

$$(1) q_B \cdot q_B / q_A \cdot q_A = E_B / E_A$$

where q refers to quantities, p refers to prices, and E to expenditures. In equation (1), we can rearrange terms to get

$$(2) q_B / q_A = (E_B / E_A) / (p_B / p_A).$$

The left-hand side gives a measure of the quantities of the given item in B relative to A. The term (p_B / p_A) is the $PPP_{B/A}$ for the item. We can then rewrite equation (2) as:

$$(3) IQ_{B/A} = (E_B / E_A) / PPP_{B/A}$$

where $IQ_{B/A}$ denotes a volume index of the item in B relative to A.

19. A relationship that is valid for a given item can be generalized to an aggregation of items; thus, for an aggregation like capital formation, the relationship in equation (3) above will also hold. More generally, we can think of the quantity index between B and A being derived from the ratio of the national expenditures in B and A divided by the purchasing-power parity. This will hold whether the quantity index pertains to an item, or to an aggregation like food, capital formation or all of GDP.

20. The form of equation (3) emphasizes the derivation of quantity indexes from expenditures and prices, which is the usual procedure in the ICP. In this case the quantity comparison is derived and should, where possible, be checked against direct quantity comparisons. For example, when in phase III initial results became available showing that meat consumption in the United States was low compared to

several European and Latin American countries, checks were made against physical indicators of meat consumption. In this case, direct quantity indexes supported the indirect estimates. When direct information on quantities or quantity indexes are readily available and/or price information is difficult to obtain, it may be preferable to rearrange equation (3) and to derive PPPs from expenditure ratios divided by direct quantity ratios.

21. The overall PPP for GDP is built up from comparisons of item prices within smaller groups of expenditures that, in the terminology of the ICP, are referred to as basic headings. The requirements for basic headings are (a) that value data, representing national expenditures, can be estimated for each basic heading and (b) that the basic headings be as homogeneous as possible from the point of view of the potential dispersion of the price ratios across countries of the goods and services belonging to each respective heading. Usually, the basic heading level is chosen on the basis that, within a basic heading, more detailed expenditure weights are not available. Since country groups will differ on the amount of expenditure detail that is available, the number of basic headings distinguished has varied between 150 and 258 for different regions and country groups within the ICP.

22. Within each basic heading, a country will provide prices for a selection of individual items from a set of written specifications developed by the ICP over the years. Within a basic heading, price ratios of individual items, such as a kilogram of long-grain rice in a plastic bag, are aggregated to produce a price parity at the basic heading level. The price ratios and basic heading parities are all denominated in CCUS, national currency units per unit of the numeraire currency. For example, if country A is the numeraire country and its price of long-grain rice is \$2 per kilogram, and the price in country B is 28 rupees a kilogram, the price ratio will be 14 Rs/\$.

23. The parity for a given basic heading is an average of the price ratios of the representative items that belong to it, taking into account all of the prices supplied by all the countries in a group. In most country groups, these basic heading parities are unweighted averages, and they can be obtained in several ways. This averaging will usually be carried out by ICP staff imposing no workload on country statistical offices; the procedures are discussed in chapter IV in some detail because an understanding of these methods is important for countries in making their item selection.

24. Once the price parities for each basic heading have been obtained, they in turn need to be averaged over all of GDP in order to get a term like $(p./yq)$ in equation (2) or $PPP./$, in equation (3) above. There is considerable literature on the alternative ways of carrying out this aggregation of basic heading parities. The literature is large because this aggregation involves weights and is another variation of the index number problem that has occupied economists and statisticians for decades. These issues are important but generally do not affect country data collection, and so discussion is reserved for annex II.

25. The inputs provided by country statistical offices to the ICP, then, are expenditures at the basic heading level and prices of items appropriately representing for that country each basic heading. This is the first and most basic step in moving from national data to international comparisons of real volumes and purchasing-power parities.

26. The regional and central organizations of the ICP then produce price parities at the detailed heading level. This stage of the work both provides a check on country data, often followed by an exchange of inquiries about the prices for particular items, and generates the inputs for the next stage of the ICP.

27. When countries and the regional and central ICP personnel have been satisfied that the price and expenditure inputs are clean, the next set of estimates is made. For each country group, such as ESCAP, the group expenditure matrix in national currencies, with basic headings on the rows and countries on the columns, combined with a comparable matrix of basic heading parities, is transformed into a matrix of real expenditures in common currency units. Entries of this latter matrix can be compared across countries at the detailed heading level or any higher level of aggregation up to GDP. Usually results are published for some 55 aggregates, such as construction, where national currency expenditures, real volume indexes, purchasing-power parities and national price levels are provided. In some regional comparisons, results have been published at the basic heading level, but whether or not they are published, the basic input

expenditure and parity data at the basic heading level can be made available to those interested in these data.

28. The procedure used in the ICP to generate the matrix of real expenditures is described in annex II. In effect, a set of international prices are used to value the basic heading national quantities (basic heading expenditures divided by parities) in each country. These international prices are an average weighted by the quantities in each country. What is important to understand about the international prices is that their pattern will be different in each region and from the world pattern. This has advantages, for example, one can compare country group price levels with the world, as well as the disadvantage that volume comparisons between countries will depend on which set of international prices are used.

D. Value of the ICP data provision to country statistical offices

29. Country statistical offices see both sides of the ICP, the development of the basic price and expenditure data inputs and the final regional and world output. In chapters II and III, the relationship between existing national statistics on expenditures and prices and the expenditure and price necessary for the ICP is discussed in detail. Specifically pointed out are the ways in which the ICP data requirements may be coordinated with national statistical programmes.

30. Some statistical offices have found that the price specifications provided by the ICP can be usefully integrated into their regular data collection surveys. Examples of this, such as the use of producer durables specifications by Hong Kong to develop a new import price index or the need for national average prices providing a stimulus for broader regional coverage of the consumer price index for a number of African countries, are discussed in chapter III. In general, the organization of the ICP data needs are intended to facilitate statistical offices in integrating these price and expenditure requirements into their regular national accounts estimates and price survey programmes. The more the ICP can supply meaningful data requirements that are close to or complement national statistical objectives, the less will be the burden of participation to country statistical offices.

31. If most of the ICP data needs can be integrated into regular data collection of national statistical offices, it is likely that benchmark comparisons can be generated routinely, even on an annual basis. The Statistical Office of the European Community (EUROSTAT) has been moving in this direction since its 1985 comparisons, and the remainder of the OECD countries also have annual comparisons as a goal. In the near future, it may not be possible for ICP comparisons to be carried out on an annual basis in regions with a large number of developing countries. However, it is still an important goal to integrate as many data requirements of the ICP as possible into routine collection of participating countries, because this will reduce national and international resource requirements for statistics.

32. A survey of the 22 African countries that participated in phase V of the ICP for 1985 was recently conducted. The results indicate that the methodology and data collection procedure used in the ICP has led to an improvement in basic statistics in the overwhelming majority of those countries, especially in the field of price statistics. The particular gains include more uniform classifications of expenditures, more attention to item specifications and quality differences in time-to-time price measurement, and improved outlet and spatial coverage. Several of these points are discussed in more detail in chapter III.

33. The price embodied in national accounts is a national average price, and this is the price concept of the ICP. Where internal prices within countries differ substantially for the same item between provinces and States, or between rural and urban areas, it is particularly important for countries to have this information as a guide to cost-of-living differences within the country. The national average price, built up from prices in various rural and urban centres, not only provides information on the degree to which various parts of a country are economically integrated, but in some countries it provides a basis for cost-of-living pay differentials within the country. Finally, regional price information generated in obtaining national average prices may allow countries to better measure regional differences in per capita income, or the regional distribution of poverty.

E. Uses of the outputs of the ICP

34. In addition to the aggregate result, namely the PPP over GDP that allows countries to convert per capita incomes to a comparable basis, the output of the ICP provides results at the basic heading and summary category level. Looking first at the aggregate results, these have been of considerable interest for both research and, at the regional or group level, assessment purposes. Regarding research, for many applications, analysts like to examine a dependent variable, such as infant mortality, in relation to an income measure and, usually in empirical applications, real GDP converted at PPPs is preferable to an exchange rate measure. In the Human Development Report (UNDP, 1991), the Human Development Index (HDI), for example, has been constructed using a measure of real product derived and extrapolated from ICP benchmark studies as one part of their overall index.

35. Both the European Communities and OECD regularly publish results of the ICP as part of their national accounts. The results have also been used for administrative purposes within EC, where for example, some social disbursements in the Community have also been made partly dependent on the PPP-based per capita GDPs of member countries. This operational use of the ICP results has, of course, reinforced the interest of those countries in actively participating in this activity.

36. At the world level in general, ICP results have not been used for assessments in the United Nations, or for concessionaire loan rates in the World Bank. The principal reason for this is that both institutions had an operational system in place prior to the ICP, and there was natural reluctance to immediately change it when improved estimates became available. Further, the benchmark estimates were usually available with a lag of several years and only covered a portion of the countries of concern to the United Nations and the World Bank. It has been the position of the Statistical Commission at recent sessions that, at the world level, ICP results would not be used for administrative purposes.

37. The ICP results at the detailed heading and summary category levels provide rich information of interest to both researchers and countries. First, the ICP output allows countries to compare their per capita quantities of expenditures on food, education and the like with countries from their region or group. Often, these comparisons turn up surprising results. For example, a comparison of the share of capital formation in national currencies between India and the Philippines based on the 1980 phase IV study reveals that, in 1980, the share for the Philippines was 30.6 per cent, 25 per cent higher than in India, where the share was 24.5 per cent. This illustration presents the investment share of GDP expenditures at national prices. Even when national currency expenditures for all components of GDP are converted to a common currency by, say, the exchange rate, it still preserves the national shares and in effect makes the comparison at national prices.

38. If one is interested in comparing the volume of capital formation in the two countries, however, then the valuation of investment goods in each country should be at a common set of prices, such as the international prices of the ICP. When investment goods are valued at international prices, the share in the Philippines drops to 21.7 per cent and in India the share also drops, but only to 23.2 per cent, so, on this basis, the volume of capital formation out of GDP is larger in India than in the Philippines.

39. This illustrates two points. The first is that prices of investment goods are high relative to other prices in both countries and, in fact, in most of the developing countries. This occurs despite the fact that construction costs are generally lower in low-income countries. The differences in international and national prices stem from comparative production costs, transport costs particularly for many African countries, and frequently from policies such as quotas and tariffs that raise the price of imported capital goods in the domestic market. For both India and the Philippines, these effects raise the relative prices of producer durables and more than offset the low construction costs in both countries.

40. The second point is that there can be big differences between national and international prices even for countries at similar income levels, as is illustrated by the example. In the particular case of India and the Philippines, it is probably the fact that India now produces more of its equipment and has lower construction costs than the Philippines that accounts for the fact that India's share of investment in GDP is larger in international prices while smaller in national prices.

41. This illustration also suggests why explanations of economic growth across countries based upon investment to GDP ratios in national currencies may be very misleading; the latter may greatly overstate the amount of new plant and equipment put in place in comparison with countries where investment goods are less expensive. Again referring to the example, the expected rate of growth that one would expect in the Philippines would be much greater if investment share were 30.6 per cent rather than 21.7 per cent. Where the growth process is related to the volume of capital formation, it seems appropriate to compare investment at international prices. As pointed out below (para. 45), for other purposes such as measuring savings efforts, shares at national prices are more appropriate.

42. Health and education expenditures as a percentage of government expenditures or GDP are often compared across countries. When these ratios are compared across countries in national prices, they give a measure of the domestic resources devoted to these uses. However, ratios in national prices do not provide a good index of the quantities of medical and health services being provided, because relative prices of these services differ greatly between countries. Even though the volume and price estimates are subject to large errors for health and education, it is informative for national policy purposes to have ratios in both national and international prices. This is an output of the ICP not only for comparison resistant services such as health and education, but also for a wide variety of expenditures where volume measures are subject to less variance.

43. To summarize, the ICP output provides a way for each participating country to see how its relative prices compare to those of countries of similar or different income levels. For example, the relative price of energy products can be compared across countries. While it is common to compare petrol prices across countries by converting the litre price at exchange rates, this only tells part of the story. For example, in 1985, the price of petrol in Pakistan was Rs 18 per litre, or \$1.07 at exchange rates, while in the United States it was \$0.74 per litre. This makes petrol appear to be about 45 per cent more expensive in Pakistan than in the United States. However, the national price level of all consumption goods in Pakistan was about 30 per cent that of the United States. Therefore, within the market basket of Pakistanis, petrol would appear to be almost five times ($1.45/.3 = 4.8$) as expensive, relative to other goods, as in the United States.

44. Many of our illustrations have pointed to the advantages of PPPs and of taking account of the differences between national and international prices. It should also be made clear that there are many instances where national prices are more appropriate. Consider, for example, country savings rates. These are usually directed at measuring a country's effort to set aside currently available output in order to augment future production. The trade-offs faced are based on national prices and so comparisons at savings rates would normally not involve PPPs. Likewise, comparisons of international asset and debt positions would usually be based on exchange rates, not on PPPs.

45. Another way of thinking about PPP and exchange rate conversions may aid in understanding the contrast. Consider maps of the world that are printed in two dimensions. In those versions that simply flattened out the globe, such as the Mercator projections, Greenland and countries at high latitudes were always made to look very large, that is, Greenland was pictured as larger than South America, when it is one sixth the size. Equal area maps, such as the Mollweide projection, elongate or warp lands in higher latitudes and stretch the outer meridians. The National Geographic Magazine (1988) has recently chosen to replace the Van der Grinten projection, which had been used since 1922, with the Robinson projection. Both of these latter maps are a compromise between the Mercator and the Mollweide projections, but in the Robinson the distortion of high latitude countries is reduced. Clearly, whatever map we use does not change the Earth that we are trying to represent. In an analogous manner, the way in which the ICP, or exchange rate conversions, represent the GDP of the countries of the world in no way changes the economic conditions of the world's population. However, the ICP representation is more stable over time than, say, exchange rate conversions, and also represents the components of expenditures in a way that is more comparable across countries.

2/ See, for example, I. B. Kravis and others, *A System of International Comparisons of Gross Product and Purchasing Power*, United Nations International Comparison Project: phase one (Baltimore, The Johns Hopkins University Press, 1975); I. B. Kravis, A. W. Heston and R. Summers, *International Comparisons of Real Product and Purchasing Power*, United Nations International Comparison Project: phase two (Baltimore, The Johns Hopkins University Press, 1978) and *World Product and Income. International Comparison of Real Gross Product*, United Nations International Comparison Project: phase three (Baltimore, The Johns Hopkins University Press, 1982); United Nations and EUROSTAT, *World Comparisons of Purchasing Power and Real Product for-1980*, phase IV of the International Comparison Project: parts one and two (Sales Nos. 86.XVII.9 and 86.XVII.10); EUROSTAT, *Purchasing Power Parities and Real GDP. Results 1985* (Luxembourg, 1987); EUROSTAT, *Comparison of Price Levels and Economic Aggregates. 1985: The Results for 22 African Countries* (Luxembourg, 1989); Organisation for Economic Cooperation and Development, *Purchasing Power Parities and Real Expenditures. 1985* (Paris, 1987); United Nations, Economic Commission for Europe, *International Comparison of Gross Domestic Product in Europe. 1985*, Statistical Standards and Studies, No. 41 (New York, 1988).

3/ The concept of real exchange rate should be mentioned in relationship to the concepts in the Handbook. The real exchange rate of a country is the exchange rate in some base year that is moved to another year on the basis of changes in relative prices between the two years of the given country and the numeraire country. A change in the real exchange rate is the reciprocal of the change in the national price level of a country. For further discussion, see Kravis and Lipsey (1982).