

GOVERNANCE, ORGANIZATION, AND METHODOLOGY FOR ICP IN ASIA AND THE PACIFIC

Governance

Introduction

A detailed governance structure was put in place for the 2005 ICP, with the Global Office providing overall project coordination. One of the problems identified with earlier rounds of the ICP (Ryten 1999) was that processes were inconsistent across different regions, which led to operational problems and unreliable results. The outcome was that the Global Office was established as the overall coordinating body. In addition, a coordinating organization was selected for each region to be responsible for statistical issues, such as developing regional product lists, data vetting, and training in each region.

The Global Office developed a governance model designed to encourage coordinated participation at each of the levels—worldwide, regional, and national. The aim was to produce results in each region that were reliable, based on a single set of standards, and consistent, so they could be integrated successfully into worldwide results.

Global Governance

The ICP Executive Board was established as the body to provide strategic leadership and make decisions about priorities, standards, overall work program, and budget. It generally met twice a year

and its members were all eminent economists or statisticians, and experienced statistical managers. Several were heads of national statistical offices (NSOs) or of statistics departments in international organizations.

The Global Office was set up in 2002 to carry out the day-to-day work required in implementing the ICP worldwide. The Global Manager was responsible for its operations supported by a team of professional statisticians and administrative staff. The Global Office reported regularly to the ICP Executive Board, with annual work programs and budgets requiring the approval of the Board. Important activities carried out by the Global Office were developing ICP standards; preparing the ICP Handbook and the ICP Operations Manual and Procedures; and producing a software suite that includes the Tool Pack used by the NSOs, regional offices and Global Office.

The Technical Advisory Group (TAG) was responsible for providing advice on technical issues related to the ICP with the key responsibilities of resolving conceptual and methodological issues. Some of those issues considered by the TAG related to establishing standards, methods, and procedures for the ICP. The TAG was also responsible for research into the implications of adopting particular procedures

and for evaluating the outcomes of PPP research projects by academics and others. Membership of the TAG included eminent academic researchers as well as experienced statisticians from international organizations and NSOs.

Governance in Asia and the Pacific

The ICP regional offices undertook the ICP work in each of the five geographic regions (Africa, Asia and the Pacific, Commonwealth of Independent States, Latin America, and Western Asia). The Regional Office in ADB was responsible for coordinating the 23 participating economies in ICP Asia Pacific.

In its region, ADB set up a Regional Advisory Board as the chief policy-making body. Members of the Board were chosen from a mix of the main stakeholders, regional agencies, and NSOs. Its main responsibilities were to:

- (i) provide guidance on regional goals, priorities, and objectives, taking into consideration the statistical needs of regional agencies and economies;
- (ii) monitor and guide annual work programs prepared by the regional coordinating agency responsible for the day-to-day management of the regional program;
- (iii) provide the mechanism for keeping all parties involved and informed;
- (iv) review annual reports on ICP progress;
- (v) advise on the sustainability of the program; and
- (vi) assist in shaping the vision of ICP for future directions.

ADB's member-economies were formally invited to participate in ICP Asia Pacific. ADB established a "Framework of Partnership" and so in this way systematically involved the participating economies in all phases of the project. The Framework of Partnership defined the roles and responsibilities of each of the parties involved, with an emphasis on how the success of the ICP was dependent on all parties taking ownership of the project.

ADB arranged several meetings for senior staff in the NSOs to formally influence the direction of the project. A meeting of the heads of participating national coordinating agencies was held in June 2003, before data collection was under way, to ensure that all agency heads understood the implications of what they were being asked to do, and to establish effective management structures and lines of communication. The Regional Advisory Board met seven times between June 2003 and June 2007, and a report was made available on ADB's ICP website soon after each meeting.¹⁸ A second meeting of the heads of the national coordinating agencies was held in July 2007, shortly before the release of the preliminary estimates, so that the Regional Office could brief them on the results.

The 2005 ICP Asia Pacific

Background

In late 2002, the World Bank invited ADB to take on the role of regional coordinating agency for the Asia and Pacific region in the 2005 ICP. There was no single reason for ADB's selection, but a combination. ADB has nurtured a good relationship with its member-economies through implementing country-specific programs on statistics, among other areas, and has spent much time and resources on the important area of statistical capacity building. The ICP was seen as a practical means of complementing this important work. In addition, ADB had the means of raising substantial funds that were crucial for implementing a large project like the ICP.

ADB set up a Regional Office to manage the ICP in the region. The Principal Statistician of the Development Indicators and Policy Research Division of the Economics and Research Department assumed the role of regional coordinator. The ICP team consisted of five staff on average between mid-2003 and mid-2007, with a peak staff of seven in 2006. The team was heavily involved in training, editing data, running data review workshops, calculating regional results, and coordinating "ring comparison" activities in the region. (See the section "Linking Regional Results—The 'Ring Comparison,'" below.)

¹⁸ Available: <http://www.adb.org/Statistics/icp/icp.asp>.

Coverage

Twenty-one ADB member-economies agreed to take part in the 2005 ICP. They were: Bangladesh; Bhutan; Brunei Darussalam; Cambodia; PRC; Fiji Islands; Hong Kong, China; India; Indonesia; Lao People's Democratic Republic; Malaysia; Maldives; Mongolia; Nepal; Pakistan; Philippines; Singapore; Sri Lanka; Taipei, China; Thailand; and Viet Nam. In addition, two other economies (Islamic Republic of Iran and Macao, China) also took part. (These are often referred to as the "23 economies" or "participating economies".)

Japan, Republic of Korea, Australia, and New Zealand were not included in the 2005 ICP Asia Pacific as they were included in the OECD/Eurostat comparisons. Consequently, no results for these countries are included in this publication. However, it will be possible to compare them with other countries in the region once the global results are compiled by the Global Office. In fact, any pair of the 146 economies for which PPP-based data have been produced for 2005 can be compared when the six sets of regional results are combined into a set of worldwide results, which are scheduled to be released on 17 December 2007. For example, it would be possible to compare, say, Singapore with Australia (from the OECD/Eurostat program) or with Brazil, which is involved in the Latin American comparisons.

Administrative Arrangements

The administrative arrangements for a broad-reaching statistical exercise like the ICP were quite complex and had several dimensions. The governance arrangements determined the administrative arrangements to a large extent. The Global Office set the broad statistical standards and resolved major problems that arose so that the greatest possible degree of consistency was maintained around the world. It also arranged regular meetings with regional coordinators to ensure that standards were applied consistently worldwide. Staff from the Global Office also attended regional meetings and visited countries that needed assistance in resolving problems.

The main functions of the Regional Office were to develop the product lists, train the national coordinators in both theoretical and practical details relating to the ICP, provide technical advice on price surveys, organize and run the data review workshops, edit the data, select the expert groups for construction and equipment prices and organize their meetings,

compile the regional results, and coordinate the Asia and Pacific economies involved in the ring comparison. The Regional Office ensured that activities were organized throughout the region.

There were two levels of coordination within each economy—a national coordinating agency and, within it, an ICP National Coordinator. In some cases, where different agencies were involved in providing the national accounts and price data for the ICP, all communications were conveyed through the agency (a list of the agencies is provided in Appendix 9). The main roles of the ICP National Coordinator were to ensure that the economy's ICP data (national accounts, prices and wages) were correctly estimated; that statistical staff and field staff (involved in collecting prices) were trained in the concepts underlying the ICP and the practical implications for collecting prices; that data were edited and entered into the ICP database; and that editing queries from the Regional Office were handled promptly. The National Coordinators were the focal persons through whom all agreements were communicated and they, too, were expected to ensure the proper implementation of such agreements and for communications to the proper authorities in all agencies in their economy. They also attended the data review workshops that were held to check the consistency of the data supplied and preliminary PPP estimates.

Financing ICP Asia Pacific

ICP Asia Pacific was a very costly exercise, in terms of both direct costs and costs absorbed by the agencies involved in collecting and producing the data. ADB met many of these costs from its own resources. However, the successful completion of the ICP would not have been possible without the generosity of the following donors: the Australian Agency for International Development; Department for International Development of the Government of the United Kingdom of Great Britain and Northern Ireland; Government of Japan through the Japan Special Fund managed by ADB; and World Bank.

In addition, the Australian Bureau of Statistics provided in-kind support by allocating staff for 17 months to the team engaged in developing the household product list.

ICP Methodology for Price and Real Expenditure (volume) Comparisons

Conceptual Framework for the ICP

In concept and in practice, PPPs are always expressed in terms of the currency of a base economy. This currency is referred to most commonly as a “numeraire currency” but “common currency” and “reference currency” are also used. The choice of a base (or reference) economy in which to express the results is arbitrary. The results could have been presented in the currency of any of the participating economies or in terms of an artificial “currency” based on a basket of currencies. No matter which currency is used for the results, the relativities (either price relativities or relative volumes) between the economies would be the same.

However, there are several useful characteristics for a numeraire currency to possess. First, it is an advantage to have a broad-based economy, so that prices are available for products in as many basic headings as possible (see the subsection “Basic Heading” in Part 2). Second, having a strong statistical system is important because it enables the country to collect a wide range of prices and to report basic heading data from the national accounts. Third, the numeraire currency provides a reference point as well as the means of direct comparisons between countries, so it is important for its value to be well recognized in the region. The Regional Office chose the Hong Kong dollar as the numeraire currency because Hong Kong, China fulfilled all the above requirements. The Regional Office would like to emphasize that this does not imply that other economies in the region failed to meet these criteria.

In practice, one calculates PPPs by comparing the prices between countries for a specified basket of the major goods and services included in GDP. The simplest situation arises when only two countries are being compared (referred to as a “bilateral comparison”). The resultant PPPs can be expressed in terms of the currency of either of the pair of countries. In such a case, the PPP for a particular product (goods or service) is the rate of exchange at which the currency of the first country would have to be converted into the currency of the second to purchase the same quantity

and quality of the product in both. The 23 economies in the 2005 ICP Asia Pacific participated in what is referred to as a “multilateral comparison,” which is a much more complicated exercise than a bilateral one, both in terms of the underlying concepts and the practical difficulties that arise from having so many diverse economies to compare.

Despite the emphasis placed on PPPs in the ICP, their role is more of an indirect than a direct nature. Their importance lies in their use as an intermediate step in producing two other datasets that are necessary for making international comparisons—volumes of GDP (or real expenditures) and its major aggregates, and indicators of the comparative price levels between countries (referred to as “price level indexes,” or PLIs). Per capita volumes are calculated as a means of standardizing the overall size of countries, by providing a measure of the income accruing from a country’s production to each of its residents. Per capita measures are particularly important in poverty analysis.

One of the key reasons for producing PPPs is that there is a systematic difference between PPP-based and exchange rate-based comparisons for low- and high-income countries. The products purchased within a country can be split into those that are traded internationally (“tradables”) and those that are not (“nontradables”). Exchange rates are the prices at which currencies trade in the financial market, and are influenced by many factors, including the prices and volumes of products traded, financial flows, and interest rates. However, they are not directly affected by the prices for nontradables, which tend to be strongly correlated with wage levels. The prices of each tradable product tend to be more uniform, regardless of the income status of the countries concerned because their prices are set, at least in broad terms, on world markets. As a result, the prices for nontradables are generally low relative to the prices for tradables in low-income countries compared with high-income countries. Therefore, a unit of local currency has greater purchasing power within a low-income country than it does in global markets, and so the GDP levels for low-income countries will be higher when converted to a common currency using PPPs than when they are converted using exchange rates. These differences are not trivial. As an example, the per capita volume of GDP for Hong Kong, China is 58 times that of Bangladesh on an exchange rate basis but only 28 times on a PPP basis.

Price Level Indexes

A price level index (PLI) is the ratio between a PPP and the exchange rate of the currency of a given country, measured with respect to a reference currency, generally expressed on a base of 100. PLIs show how the price levels of countries compare with each other. Travelers often return home with stories about visiting a country that was “cheap” or “expensive”. In effect, such travelers are comparing the PLI in their home country with that of the country they have visited. If the PLI of the country they have visited were less than that in their home country, the country visited would have been considered “cheap”. Conversely, the visited country would be considered “expensive” if its PLI were greater than that of the home country. In the ICP, the base of 100 usually refers to a regional average but any country (or group of countries) can be used as the base.

The way in which a PLI is constructed can be seen by taking the Big Mac example a step further (see previous subsection, “Purchasing Power Parities”). Table 15 shows the data used in that example, plus a notional exchange rate between Hong Kong, China and Malaysia.

As seen from Table 14 in Part 2, the PLI can be presented in several different ways. However, in each case, the PLI shows exactly the same thing—that the price level in Hong Kong, China for a Big Mac is about 11% higher than in Malaysia.

In practice, PPPs tend to change slowly over time because price levels do not usually change abruptly. In contrast, exchange rates can (and do) change suddenly, which could cause PLIs to change significantly in the short term. A shift in exchange

rates could change PLIs to the extent that a relatively cheap country becomes relatively expensive, even when prices in the various countries have not changed significantly.

Real Expenditure (volume) Comparisons

The main aim of compiling PPPs is to produce volumes (also referred to as “real expenditures”), that can be compared between countries. In a spatial comparison, a volume is a measure of the relative size of an expenditure category between the countries involved in the comparison. The volume of GDP provides a measure of the size of each country, expressed in a common currency. Volumes can also be expressed in terms of index numbers, which indicate the relationship between each country and either a base country or a regional average. The volumes are derived by dividing the corresponding expenditure by the corresponding PPP. In this respect, PPPs are similar to price deflators in the national accounts, which are divided into the values to which they correspond to derive time series of volumes. In the ICP, volumes can be calculated by applying PPPs at any level of expenditure on GDP, from the basic heading right up to GDP itself.

For many uses, volumes are expressed in per capita terms to provide a measure of activity, standardized to provide an indication of the income accruing from production to each resident of a country. The per capita volume of GDP is often used as an indicator of relative incomes between countries. It is important to note that it provides only a broad indication of relative incomes because GDP is a measure of production and so actual income can be affected by other flows, such as income distributed to or from abroad. Despite such shortcomings, it is the

Table 15. Big Mac Index Illustration

Item	Hong Kong, China	Malaysia
Big Mac (in local currency)	HK\$12.00	RM5.70
PPP	2.105	0.475
Exchange rate	2.000	0.500
PLI (PPP / Exchange rate * 100)	105.3	95.0
PLI (Hong Kong, China = 100)	100	90
PLI (Malaysia = 100)	111	100

PPP = purchasing power parity; PLI = price level index.

broadest economic measure available on a consistent basis across multiple countries. In addition, analysis has shown that, generally, the wealth of a country is broadly correlated with the per capita volume of GDP.

The 2005 ICP provides a benchmark for comparing economies in Asia and the Pacific. Until benchmark data become available from the next ICP round, the PPPs and volumes will have to be projected forward. The time series national accounts data can be used to update the 2005 benchmarks, although the assumptions underlying this process can be quite restrictive when economies at different stages of development are involved. At this stage, no decision has been made on extrapolation methodologies.

Requirements for Valid Price and Volume Comparisons

Calculating PPPs is only the first step, albeit the most complicated, in producing the data required by analysts to make intercountry comparisons of, for example, standards of living, productivity levels, and poverty. As is the case in producing time-series price data, detailed requirements must be met for the resulting PPPs to be useful. A major input into the compilation of PPPs is price data. Therefore, in order to have PPPs that are meaningful, the prices collected in each country must be consistent with national accounts values; prices collected are for comparable products; and prices are representative of the products purchased. In practice, these constraints are much more restrictive in an ICP context than for a time series of prices within a single country. For example, in a CPI within a country, it is reasonably straightforward to handle a change in the product most commonly purchased, with price collectors instructed to collect the price of a similar product, preferably with a price for both the new and superseded products being collected for an overlap period. However, replacing a product specified in the ICP product list by another is not an acceptable practice because it is critical for the comparison that the products priced in one country can be matched in other countries.

Consistency of Price Measures with National Accounts

Consistency here refers to the relationship between the prices underlying the PPPs and the national accounts data to which the PPPs are applied to derive volume estimates. The price deflators used in deriving time series of volumes in the national accounts must be consistent with the values they are deflating. For example, the prices used to deflate investment in equipment must relate to the types of equipment underlying the expenditures. The same is true with PPPs, but it is more difficult to ensure that this criterion is met because it has to be satisfied simultaneously across multiple countries, which imposes some constraints on the products that can be selected for pricing.

The consistency requirement has important implications for the process involved in preparing product lists for price collection. In order to decide on the products to be priced, it is necessary to examine the coverage of the particular aggregate in the national accounts and then to identify the products. It is in this context that the property of “representativity” becomes important.

Representativity

The next important criterion is that the products selected for pricing are representative of the products purchased in each economy. In practice, it is inevitable that differences will arise in the types of products purchased under the same basic heading in different economies, particularly given the cultural and economic diversity in the region. As a result, some trade-offs were required to ensure that the products priced were representative of the expenditures to which they relate in each economy. The ICP Handbook (chapter 4) defines representativity as follows:

Representative products [are those that] figure prominently in the expenditures within a basic heading within a country. They are therefore products that are frequently purchased by resident households and are likely to be widely available throughout the country.

Representativity is an important criterion in the ICP because the price levels of nonrepresentative products are generally higher than those of representative products. Therefore, if one country prices representative products while another prices nonrepresentative products under the same basic heading, then the price comparisons between the countries will be distorted. Basic heading—the lowest level for which expenditures are available in the ICP—are broad expenditure categories and so are not sufficiently fine to identify a single product that would be classified as representative of the basic heading. As a result, a fair degree of judgment is required of price statisticians to identify several products that are fairly representative of each basic heading across the region. Some guidelines were set out to assist in this process. For example, the best-selling product of its type (e.g., brand of cigarettes) would be representative. Similarly, any product included in an economy's CPI would be considered representative. It is ideal, and would also lead to more reliable price comparisons, if several different products within a single basic heading could be classified as representative.

One point that needs to be emphasized is that the product lists were set up to provide the greatest possible opportunity for economies to identify representative products to price in each basic heading, so no single economy was expected to price all the products under any individual basic heading. However, all economies were expected to price some product(s) that were available but not representative of their expenditure so that they could be matched with prices collected by other economies.

It is important to note that the criterion of representativity was applied only to products within household final consumption expenditure. The employee categories for which wages data were required in government final consumption expenditure (GFCE) and the goods priced in gross capital formation were specified by the Global Office in a way to ensure they were as representative as much as possible for all economies in the ICP around the world.

Comparability

Comparability was the third important criterion in defining the products to be priced. The ICP Handbook (chapter 4) defines comparability as follows:

Two or more products are said to be comparable either if their physical and economic characteristics are identical, or if they are sufficiently similar that consumers are indifferent between them.

Alternatively, two similar products may be said to be comparable if consumers are indifferent as to which of the two they consume. This implies that consumers are not prepared to pay more for one than the other.

Identifying comparable products was a difficult process in Asia and the Pacific because of the diversity of cultures and standards of living. The starting point for ensuring comparability was to define detailed specifications for each product to be priced. In some cases, it was necessary to define products specifically to cater to different parts of the region. For example, some economies consume rice as a staple, particularly in South Asia, but in many East Asian economies noodles are much more important. As a result, detailed specifications were set up for rice and for noodles, but economies were not expected to price both unless they were readily available.

Comparability is a difficult criterion to handle in practice. It was necessary in some cases to provide product specifications that were not as tightly defined as desirable so that comparability could be ensured. A product selected for pricing is more likely to be comparable between economies if the specifications are tightly defined—but the more tightly defined the product the more difficult it becomes to find products meeting the specifications precisely. Similarly, two products that differ in respect of some price-determining characteristics will generally not be comparable. Again, it was necessary at times to define products more loosely to enable economies to find products meeting the specifications. The downside of this process, though, was that it became much more difficult to determine whether economies had priced the same items.

When determining product lists for pricing, it is necessary to strike a balance between comparability and representativity. On the one hand, comparability is very important because it is difficult to make sense of price comparisons unless the products have similar characteristics, including quality. On the other, representativity is also important because the prices of nonrepresentative products are usually higher than those of representative ones. If the correct balance between these concepts is not struck, the price comparisons between the economies concerned are likely to be distorted, possibly significantly so. Good judgment is required on the part of the staff collecting prices for the ICP in the trade-offs involved in balancing comparability and representativity. The Regional Office provided training on ICP concepts and principles to the NSO staff who were to collect prices and those who were going to edit the data. This is one reason why the Regional Office conducted several workshops for the preparation of product lists for the region. In addition, several workshops were held to validate price data collected and to ensure that participating economies were collecting prices of comparable products.

Data Requirements

Price Data

The major costs incurred in producing PPPs are those associated with defining the specifications of the products to be priced, collecting the prices for these products, and then editing them. Specifications for products in a CPI can vary from place to place within a country, provided that they are consistent over time. In contrast, in the ICP it was imperative that the products for which prices were collected were strictly comparable across economies, leaving little room for discretion in product selection. As a result, defining the price-determining characteristics of the products was a critical aspect of the whole project. A new approach was adopted in the 2005 ICP to develop the product specifications. It involved systematically defining the characteristics of each product to be priced in each region using “structured product descriptions” (SPDs). (See the section “Structured Product Descriptions,” a few pages below.)

Varying numbers of products were specified under different basic headings, depending on the range of products that were considered representative of each basic heading. For example, postal services are highly centralized in most economies, so it was

possible to cover the postal services basic heading with only a handful of products. In contrast, the rice basic heading required 21 different rice products to be specified because of the large number of rice products available in the region.

Photographs of products were provided as one way of overcoming language and interpretation problems, although the extent to which this could be done was restricted by the limited time available. The communication problem was particularly important when agencies trained their field staff in how to identify the products to price.

While it was a difficult and time-consuming task to define SPDs for all 656 products in individual consumption expenditure by households, the Regional Office considers it to have been very worthwhile. The SPDs enabled products to be matched across economies more precisely than would have been possible otherwise. In addition, they were used extensively by the ring economies from all regions in identifying products to include in the “product ring list”. (See the section “Linking Regional Results—The Ring Comparison,” a few pages below.)

GDP Aggregates in Local Currencies— Levels and Expenditure Weights

National accounts statistics play two important roles in the ICP. First, one of the main purposes of the ICP is to compare real expenditures on GDP and its components between countries. Such a comparison is made by converting national accounts aggregates expressed in local currency units to a common currency using PPPs. The reliability of these comparisons depends largely on the accuracy and international comparability of the national accounts statistics in local currency units reported by countries.

Second, the price relatives—or PPPs—calculated at the most detailed (basic heading) level are aggregated to progressively higher levels and eventually to GDP using weights derived from the national accounts. The weights are the expenditures on each basic heading as a share of GDP. Again, the accuracy and the comparability of these weights can impact on the accuracy and comparability of the PPPs as they are aggregated up from the basic heading level.

GDP Levels

International comparability of the national accounts statistics reported by participating economies was generally satisfactory because they all follow one of the two latest versions of the UN System of National Accounts (SNA). Several economies are still in the process of changing from the earlier 1968 version to the latest 1993 version which was used as the standard for the 2005 ICP. However, the differences between the two versions are relatively small for total GDP and its expenditure components. The main differences are that, in SNA93, expenditure by enterprises and government on computer software is treated as GFCF rather than as intermediate consumption as in the SNA68, and the imputed service charges for financial institutions (financial intermediation services indirectly measured—FISIM) are distributed to final users. Not all economies followed the 1993 guidelines for software and FISIM, but this would not have had a major impact on comparability.

During the 5 years from the beginning to the end of ICP Asia Pacific, several economies took steps to bring their national accounts more into line with SNA standards. For example, Mongolia widened coverage of its estimates of housing rentals and Cambodia, Lao PDR, and Pakistan revised their methodologies for estimating government consumption expenditure. These are practical examples of “capacity building”—one of the declared objectives of the 2005 ICP.

The accuracy of the national accounts naturally varies considerably among the participating economies: it is clearly much easier to estimate GDP for a small city-state like Singapore or Hong Kong, China than for economies like PRC, India, or Pakistan, which have large areas, huge populations, and major differences in levels of economic development. During the period when ICP Asia Pacific was being implemented, most economies made some revisions to their 2005 national accounts. Most were relatively small revisions from preliminary to final estimates but two economies—PRC and Brunei Darussalam—made much larger “benchmark” revisions. Following its 2004 economic census, GDP for the PRC in current prices was revised upward by nearly 17%. In Brunei Darussalam, a revision of just over 60% was made to current price GDP, following analysis of the results of the 2002 economic census, which showed that there had been substantial underestimation of private sector value added. In addition, a new methodology was introduced so that GDP is now estimated from both the expenditure and production

sides. Revisions of this size are a sharp reminder of the uncertainty surrounding GDP estimates in many developing countries—and not just in the Asia and Pacific region.

Bangladesh, India, and Pakistan compile their annual national accounts for “agricultural years” running from 1 July to 30 June; Nepal from 16 July to 15 July; and the Islamic Republic of Iran uses a traditional Persian calendar beginning in March. These countries were required to convert their accounts to a calendar year basis using information from quarterly statistics.

Expenditure Weights

Economies were required to break down final expenditures on the GDP into 155 basic headings. Table 2 shows the main expenditure components of GDP as defined in SNA93 and the number of basic headings in each one.

In their own national accounts publications, most economies classify final expenditures on GDP into much fewer than 155 categories and those that do have detailed breakdowns—Indonesia and Hong Kong, China for example—do not use the ICP classification. For all economies, therefore, providing the 155 expenditure weights for the basic headings was a major undertaking. A variety of sources was used including expenditure weights taken from CPIs, household expenditure surveys, government expenditure accounts, and capital expenditure surveys. In some cases, economies used weights that had been calculated for earlier rounds of the ICP.

When the economies had submitted their initial estimates for the 155 basic headings, the Regional Office calculated the averages for the region as a whole and for subgroups such as South Asia, High-Income Economies, and Southeast Asia. Outliers—particularly high or low expenditure shares—were identified. The participating economies discussed these with the Regional Office and made adjustments as necessary.

Although it is certain that many of the 155 basic heading expenditure weights are approximate, the larger weights are generally much more reliable than the smaller weights. For example, the weights for important basic headings such as rice, poultry, or garments have certainly been more accurately estimated in most economies than the weights for the

smaller basic headings such as “Repair of furniture, furnishings and floor coverings” or “Small tools and miscellaneous accessories”. Inaccuracies in the weights for basic headings with small weights do not have a large impact on the calculation of the PPPs for broad aggregates.

The participating economies were initially required to estimate basic heading weights for 2004. These then had to be converted to the 2005 reference year for the ICP. A few economies—Singapore and Taipei, China, for example—estimated a new set of basic heading weights for 2005 but most economies used a less burdensome updating procedure. The detailed 2004 weights were converted to 2005 using the expenditure breakdowns available in each economy’s official national accounts. For example, if the national accounts showed that household expenditure on food was 15% of GDP in 2004 and 14% in 2005, the detailed 2004 basic heading weights for food were each multiplied by $14/15$ —i.e., they were reduced using a factor of 0.933.

In several economies, the published breakdown of expenditures included a statistical discrepancy. It generally arises because economies consider that their best estimate of GDP is obtained by adding up the value added of different kinds of industries rather than by adding up their expenditure estimates. The statistical discrepancy was ignored in calculating the weights. In other words, the weights were calculated as shares of GDP *minus* the statistical discrepancy. This procedure assumes that the statistical discrepancy is distributed on a pro rata basis over all the expenditure components. An exception was made in the case of Fiji Islands because its 155 expenditure weights were based on rather out-of-date information and the statistical discrepancy was over 15% of GDP. The Fiji Islands experts decided that the estimates for government consumption expenditure in 2004 were of good quality, and the statistical discrepancy was distributed only over the other expenditure components.

Data Collection: Sources and Methods

The national accounts provide the framework for the ICP. The classification of the 155 basic headings provides the basis for specifying the products to be priced for the ICP. HFCE is the largest single component of GDP. It was also the most difficult to deal with operationally in the Asia and Pacific region because of the diversity of participating economies.

In some regions, the products priced in the CPI were comparable across several economies and so the prices collected for CPI purposes could be used in many cases. Consequently, the special collections required for ICP purposes could be limited to a relatively small number of products. However, the diversity of economic and social conditions in the region meant that prices for the ICP had to be collected in one-time surveys for many household consumption products.

A total of 656 products was specified in the region for individual consumption expenditure by households. No economy was expected to price all products because some had been defined to cater to different parts of the region. However, some were relevant across most economies.

The special price collections were carried out in a range of outlet types across different localities (including an appropriate urban–rural mix) in each economy. The aim was to have the samples selected in broad proportion to the importance of the outlet types and urban–rural localities, so that specific weights were not required to combine the prices collected for any individual product.

Fewer prices were required for other components of GDP, but the issues associated with ensuring they were comparable and representative were even more difficult to resolve than for household consumption products. Differences in the classifications of government employees, the diversity of materials and methods used in construction, and the variety of equipment used in the region meant that pricing comparable products across the whole region was a very difficult task. (Details of the ways in which the product lists were developed are presented in the next section.)

The participating economies were advised to engage the services of domestic experts for the construction and equipment sectors, since expertise in these fields is often unavailable in NSOs. The Regional Office established two special “core groups”—of experts on construction and on equipment—to tackle the problems associated with the pricing of these products. Members of these two groups all came from the participating economies and were selected on the basis of their skills in the field. Generally, they were not from NSOs; rather they were staff members of agencies directly involved in the relevant fields (e.g., Ministry of Public Works for construction prices) or from private businesses such as a quantity surveyor’s office. The core groups provided valuable inputs toward ensuring product parity for the two sectors. Each group held two meetings to review the prices in a similar manner to the household data review workshops, to check the comparability and representativity of the prices supplied for products. For construction, not only did the core group identify outliers, but it also prepared a document on key price-determining characteristics so as to assist participating economies to price construction inputs and components consistently.

Developing Product Lists

Background

The Regional Office was responsible for preparing the product lists for HFCE, other than that for rents (which was produced by the Global Office). It was assisted by the ICP Product List Development Team from the Australian Bureau of Statistics (ABS) between March 2003 and July 2004. The task of defining the HFCE product list was divided into two phases; the first related to food, beverages, and clothing and footwear; and the second to the remaining consumption items. The first phase was completed in early 2004 and the second in July 2004. The Global Office set up the lists for government consumption and for investment on construction and equipment.

The products were defined within the ICP basic headings, which were based on aggregations of classifications based on the COICOP. The importance of products in the region was determined by the share of each basic heading in total HFCE. The number

of specifications in any particular basic heading was based mainly on this indicator of importance (e.g., in ICP Asia Pacific, rice was split into 21 individual specifications).

The economic and cultural diversity of the region rendered it impossible to identify products that were both comparable and representative regionwide. As a result, some products were identified on the basis of their importance in economies in one part of the region and were defined in terms of the main characteristics of the products available in those economies. One implication of this approach was that no economy was expected to price everything in the regional product lists. In addition to the rice and noodle example a few paragraphs earlier, was the fact that some types of meat would not be priced in some countries (pork in Bangladesh, beef in India) and spirits were not priced in Brunei Darussalam.

Apart from differences in the products themselves across the region, similar products sometimes turned out to have significant differences in quality. In some cases, it was possible to define the characteristics causing the quality differences in the product specifications (e.g., broken rice) but in others this was infeasible. Defining product specifications is a balancing act between having specifications that are so tight that economies are unable to find products that match, or having looser specifications that result in the products being priced differing significantly from one economy to another.

Quality differences often arose as a problem when specifications were loosely defined. Some cases for which specifications were defined too loosely became more apparent once pricing had started and prices were being compared across economies. Two alternatives were available to deal with such products. In some cases, it was possible to split the initial product into two separate (but similar) products and compare them across the economies that had priced them. In others, it was necessary to delete the product from the list. The main problem areas in this respect were clothing, professional services, telecommunications (because of the difficulty in matching the types of calls in different economies), and public transport fares (because of varying methods of ticketing, based for example on time, distance, or some combination of the two).

Language proved to be a time-consuming issue. All the specifications were originally defined in English and then the finalized specifications had to be translated into 18 different languages before price collection began.

Structured Product Descriptions

A new method was introduced into the 2005 ICP for systematically identifying the characteristics of products to be included in the ICP product list. It was based on setting up the “structured product descriptions” (SPDs) that contain all the possible characteristics associated with a product type. After deleting characteristics that were considered not to be “price-determining,” the remaining characteristics were grouped into specifications that identified a particular product. The starting point in defining SPDs was the “open product specifications” prepared by the US Bureau of Labor Statistics for identifying the characteristics of the products to be priced in the US CPI. The Bureau defined these specifications at the level of “elementary list items” that were classified by the structure of the US CPI. The Global Office mapped these categories to ICP basic headings and then sought the assistance of each ICP region in modifying them for more general use in the ICP.

Setting up the SPDs was a very large and relatively complex task requiring both a detailed knowledge of the products that could potentially be priced for the ICP and their price-determining characteristics. The Bureau had developed the open product specifications to assist in collecting the characteristics of products that were to be quality-adjusted using hedonic regression techniques. As a result, they included much detail that proved to be irrelevant to countries with simpler market structures than those in the US. Also, there was no overriding classification structure and US-specific language had to be adapted to cater to the broad range of economies in the ICP. The detailed characteristics identified in the US specifications were used as a starting point. Price statisticians from economies in Asia and the Pacific assisted the team involved in developing the product lists to delete any characteristics that were not relevant and to add in any other characteristics that were important in the region. The types of characteristics included in the SPDs were the type, variety, seasonal availability, quantity, packaging, and pricing basis. Some characteristics were omitted from the SPDs because they were considered not to be price-determining (e.g., color).

For simple items, such as basic food products, the SPD process was reasonably straightforward, but it was a much more difficult process for other parts of HFCE. Language was an important limiting factor in the process used to describe the products to be priced, including SPDs. Precisely specifying the price-determining characteristics of products often required expert knowledge specific to the products in each particular field. For example, knowledge of milling processes and the different types of outputs produced was needed in the area of cereals. In addition, the terms used for the different products (flour, wholemeal flour, semolina, bran, and germ) differed across economies. Individual-economy price statisticians did not always know or were not always readily able to find the translation of these terms into those used in their economy. Another example related to cuts of meat, which varied by economy, and the local equivalent of terms used elsewhere was not often known by price statisticians.

Household Final Consumption Expenditure Products

The starting point was to examine the product lists used in the OECD/Eurostat PPP program and the worldwide product lists from the 1993 ICP. However, only a few of these product specifications could be used so, essentially, development of the ICP Asia Pacific lists had to start from the very beginning.

Developing the product list for household consumption expenditure was a shared responsibility, with regional economies closely involved with the teams working in the Regional Office and ABS. An inception workshop was held in Bangkok at end-July 2003. Apart from formally launching the 2005 ICP in the region, it also agreed on a work program including a timetable and the work and responsibilities involved in defining the product lists for household consumption.

The initial specifications prepared by each economy were reviewed, through visits to the economies, by the ICP Product List Development Team and through visits by economies in groups of about four to ABS in Canberra. Some difficult issues were clarified during these meetings and the product specifications were refined. The next step was to prepare draft regional product specifications, based on the revised economy specifications, and send them to all regional economies for review. Economies were asked to indicate which products they could price

and which of those were representative, and which products they could not readily price. Respectively, these products were classified as *representative* products, or products available for pricing but *not representative*, or products *not available* for pricing. The team produced a consolidated list, which was discussed at a regional workshop held in Bangkok in early 2004 to finalize the regional product list for food, beverages, and clothing and footwear, and to plan the work required on the second phase of the household consumption product list.

This second phase was more difficult than the first, despite the lessons learned from the earlier work. The basic headings covered by the second phase included several difficult areas such as furniture, motor vehicles, and maintenance of dwellings. However, the SPD process worked better in this phase because the teething problems in defining the SPDs had been overcome and the bugs in the SPD software had largely been eliminated. A successful regional workshop was held in Manila in July 2004 to finalize phase 2 of the regional household product list. The Asia and Pacific region went further than the other regions and prepared a product catalogue with pictures and circulated these to ensure correct product identification, and thus comparability, during price surveys.

General Government Services

Most government services are supplied free or at a nominal cost so it is not possible to observe values for their output. Therefore, in the national accounts, the output value of government services is calculated as the sum of the costs involved in producing such services. These costs consist of intermediate consumption, net taxes on production, gross operating surplus, and compensation of employees. Government final consumption expenditure (GFCE) can then be calculated by deducting the value of any receipts from sales from this value of output.

Intermediate consumption covers a wide range of goods and services such as printing supplies, office rent, computer services, office cleaning, and electricity. In all the regional economies, net taxes on production of government services are insignificant or zero. Gross operating surplus consists of the net operating surplus plus consumption of fixed capital. In most economies, the net operating surplus of general government is insignificant or zero, and so this item consists only

of consumption of fixed capital. Receipts from sales cover things such as partial charges for education and health services, and entrance charges for museums. For the 2005 ICP, reference PPPs were used for all these items.

For ICP purposes, GFCE was first classified by function (e.g., health, education); and then by four types of expenditure (compensation of employees, intermediate consumption, gross operating surplus, and net taxes on production), and receipts from sales. Compensation of employees was the largest component and most of the effort in collecting price data was concentrated on this item. Detailed specifications were set up for different types of government employees (doctors, nurses, teachers, etc.), by defining those characteristics that would potentially impact on pay rates, such as qualifications, relative grade, and length of experience. Economies were asked to provide total salary rates for each specified type of worker, including any fringe benefits and amounts paid directly into superannuation. Economies also supplied information on hours worked and holidays, so that compensation for each occupation could be converted to an hourly or daily basis. Allowances were made for differences in the productivity of government workers between a number of economies. (Details of the methodology used for the productivity adjustments are presented in Appendix 4.)

Health

Health was one of the most difficult components to measure. For ICP purposes, health goods and services were considered under several basic headings in determining the method to be used for pricing the products concerned to derive PPPs. Health goods and services referred both to those paid for by households and to those provided by government.

Starting from the product list provided by the Global Office, ICP Asia Pacific further refined the product list with more detailed specifications, identifying international brand names for both pharmaceutical and therapeutic products to enhance comparability. For some items where confusion was likely to arise, pictures were also circulated. Previous experience with the household product list showed that the type of the outlet surveyed was a key price determinant. Thus, definitions were provided for the types of outlets from which medical, dental, and hospital services were to be collected.

Products and services can be purchased in four ways: (i) households purchase and pay for them in full; (ii) households purchase private insurance and the insurance company reimburses the purchaser of the products; (iii) they are purchased and paid for in full by government, for distribution to households; and (iv) they are purchased and paid for partly by households and partly by government.

The PPP derived for consumption expenditure on health services included a combination of prices paid by consumers and government contributions measured by the sum of inputs (i.e., compensation of employees plus intermediate consumption, net taxes and gross operating surplus, less receipts from sales). A reference PPP was used for hospital services because of the difficulties involved in specifying and pricing comparable products across economies, particularly given the huge range of ways in which hospital services are provided and charged for in different economies. The reference PPP used was that for the production of health services by government (excluding net taxes on production and receipts from sales).

The prices to be collected should reflect the full price, no matter who is paying for the goods or services. In other words, purchasers' prices are required. In the ICP, the full price paid by the consumers was required for products purchased using either of the first two means listed above. For the third way listed above, the full cost of each product to the government was the "price" required. The final means of payment was the most difficult to handle in practice. The price required for ICP purposes was the total of any amounts paid by the consumer plus any contribution to the overall cost made by the government.

Education

Like health, education was a problematic component for the ICP. The key problem was the wide variety of institutional arrangements for providing education services across the region. The mix between private- and government-provided education services differed significantly, and fees for private education also varied depending on the extent to which components of private education were subject to government subsidies.

Detailed guidelines were established for pricing private education services to ensure that prices collected for education were as comparable as possible between economies. The prices collected related only to private education since most government education

is provided free or at nominal prices, so no market price is observable. Education was split into broad categories covering primary school; secondary school; tertiary education; and tutoring-type services such as language or music lessons, or tutoring in school subjects such as mathematics.

Education services can be purchased broadly in three ways: (i) households purchase and pay for them in full; (ii) they are purchased and paid for in full by government, for distribution to households; and (iii) they are purchased and paid for partly by households and partly by government.

Only the first two methods were "priced" for the ICP. Prices were collected for several types of education services that were paid for in full by households. The wages for some specific categories of teachers were used, in conjunction with some reference PPPs, for education services provided by government.

Construction

Construction is a major part of investment. It is also one of the most difficult components of GDP to price. Two different approaches were used in calculating PPPs in the past—one based on pricing inputs and the other on pricing outputs. The first was to price the labor and material inputs used in constructing buildings and in civil engineering projects and to weight the prices together to provide an overall price for each major type of construction activity. The main advantage is that it is the least costly method, but it had the significant disadvantage of making no allowances for differences in profitability between economies or for productivity differences. The second approach was to define models for some specific construction activities (a house, a factory, a length of highway, a bridge) and to have each fully costed by quantity surveyors. The advantages were that it took full account of productivity differences between economies and the overheads associated with each type of construction. However, it was very costly to define the range of construction projects required and to regularly update the specifications so that they continued to reflect up-to-date construction techniques.

The 2005 ICP introduced a new approach, the "basket of construction components" (BOCC). It involved pricing outputs but focuses on pricing major, installed components of construction projects, identified by breaking different projects into their

major components and then specifying the most significant elements of each for pricing. The final prices included the cost of materials, labor (based on the cost of completing a particular task rather than the cost of a fixed amount of labor), and the cost of equipment had it been hired. The materials and the relative proportions of labor and equipment used were different depending on the economy concerned, and the BOCC approach took account of such variations in the shares of labor and equipment used. The Global Office was responsible for specifying all the outputs to be priced, and selected 23 components and 11 basic inputs that represented the broad types of construction activity around the world. Productivity differences were taken into account within each of the 23 components (e.g., digging and pouring a foundation). The profit margins for managing the overall project, as a proportion of the total cost of each component, were assumed to be identical between economies. The prices for the various components could be aggregated, using different weighting patterns, into totals for different types of projects within an economy.

Equipment

The other major part of investment is capital equipment, which has also proven to be problematic for PPPs in the past. As was the case for the construction PPPs, the Global Office developed the specifications for equipment on a worldwide basis, in consultation with the regions. SPDs were defined for a product category and then refined by removal of any characteristics not considered to be price-determining. Experts from the region attended a workshop to check a preliminary regional product list for equipment after which they had to verify whether they could price the majority of items. Experts on equipment products provided technical guidance to the economies on the way in which the product list had been developed and on how to run the price surveys for these products. All economies were advised to engage local experts to conduct the equipment price surveys. Major items of equipment are produced by a limited number of manufacturers so it was generally possible for the region's economies to price one or the other (and sometimes both) of the specifications for each product. When it proved impossible to price either of them, economies were asked to price a similar, readily available model and to describe the divergences in its characteristics from those set out in the ICP specification.

From the original seven basic headings for the equipment sector, two basic headings—fabricated

metal products and other manufactured goods—were excluded from the comparison. Comparability was difficult to achieve as a result of the wide variations in local standards and practices, and in the construction technology for fabricated metal products. Other manufactured goods faced the same problem so this category, too, was excluded from the regional list.

Dwelling Rents

In the national accounts, housing rent is made up of two major components: the actual value of rents paid by those renting dwellings (whether from government or the private sector); and the value of the rents imputed for those who either own or are purchasing their own dwellings. In effect, the imputation is based on the assumption that such “owner occupiers” are renting their dwellings from themselves. The reason for the imputation is that it prevents the level of GDP being affected by changes in the share of dwellings being rented within an economy. A simple example can be provided, based on an assumption that there is no change in the composition or size of the total stock of dwellings. In the absence of the imputation, an increase in the share of dwellings rented would show up as an increase in the rent actually paid by renters, and so as an increase in both HFCE and GDP. With the imputation in place, the increase in actual rent paid would be offset by a corresponding decrease in the amount imputed for owner occupiers and so there would be no change recorded in either HFCE or GDP.

Rent of dwellings has proven to be one of the “comparison-resistant” components in the past, for two underlying reasons. The first is that the rental market is very small in some economies and is biased toward a particular socioeconomic group, such as expatriates living temporarily in the country or diplomatic staff, who rent higher-quality dwellings than are typically available to the local population. In such cases, it is difficult to match the types of dwellings in the rental sector with those that are owner-occupied. Second, and much more importantly for the ICP, the prices reported for ICP purposes have not always been consistent with those underlying the national accounts, particularly for the imputed rent component. As a result, the volumes calculated using the PPPs for different economies have not been consistent with the relative sizes of the housing stock in those economies.

Details of the approaches considered and the one finally adopted are presented in Part 4.

Price Survey Framework

Introduction

The issues behind collecting the prices for the products specified in the regional product list differed to some extent, depending on whether the products were in HFCE or in other aggregates (GFCE, GFCF). In each case, the prices were collected from a sample of outlets in a sample of locations. However, different types of outlets had to be sampled at different times of the year for products within HFCE.

Household Final Consumption Expenditure Products

A fundamental concept in the ICP is that the prices used to calculate PPPs should be consistent with the expenditure estimates for each basic heading in the national accounts. This concept leads to the requirement that the prices recorded should be national annual average prices. As a result, the products priced within each basic heading must correspond to (i.e., be representative of) the types of products purchased under that heading, be actual transaction prices, and be collected from different types of outlets and a range of localities across the economy throughout the whole of 2005.

In theory, the national annual average price for each product specified in the ICP lists would be the average transaction price over the course of 2005, obtained as the total value of the product sold throughout an economy divided by the number of units sold. In practice, this is an impossible requirement to meet, so the ICP adopted a similar process to that used by NSOs to collect prices for the products included in their time-series price indexes. It involved selecting a sample of outlets in different localities and recording the price actually charged for each product at that time. Prices were collected quarterly to take account, at least to some extent, of price fluctuations during the year. The prices of some products are seasonal and can vary significantly even within a quarter. The method used to handle this problem was to collect prices from different outlets at different times in the quarter to spread the prices for the product concerned across time.

Prices in rural areas are generally lower than those in urban areas but collecting prices in rural

areas is more costly than in towns and cities, and it often proved to be difficult to find the products specified. Also, experience with collecting prices for the time-series price indexes shows that prices collected can vary significantly depending on the type of outlet involved. For example, a local market would generally sell a particular product more cheaply than a department store. Therefore, each product had to be priced in the different types of outlets (local markets, supermarkets, department stores) roughly in proportion to the share of sales from each of these types of outlets. Similarly, prices in urban areas for most products tend to be higher than those in rural areas, so both types of localities had to be represented in the price sample, approximately in proportion to their sales. A key factor in price collection was to ensure that prices for each product related to the same quality, no matter whether it was collected in an urban or rural area or from any type of outlet. The main methods for ensuring constant quality were for price collectors to follow the detailed SPDs defined for each product and for the national coordinator to thoroughly check the prices collected for each product, classified by type of outlet and by locality.

The CPI is one of the most important economic statistics produced in an economy. A supplementary aim of the 2005 ICP round is to provide NSOs with a means of enhancing their price collection infrastructure to enable improvements to be made to their CPIs. With this aim in mind, the computer software developed to collect and edit prices for the ICP (“Tool Pack”—see the last section in this part) can also handle the price data and calculations required for the CPI.

Price collectors have a certain degree of latitude in collecting prices for a time-series price index (such as a CPI) because the key criteria to be met are that each product is representative of the locality and outlet, and that it is identical to the product for which the price was collected in the previous month/quarter. Yet the key ICP requirement is to match “like with like” between economies. As a result, a crucial issue for field staff collecting prices for the ICP was that products priced must meet the specifications completely because the specifications had been defined to provide the best match of comparable products between economies. In some cases, this meant that the product priced might not have been the one that was most representative of expenditures in the outlet or locality.

The number of products to be priced varied from one basic heading to another. Compromises had to be made in defining the basic headings because of the constraint that they had to be consistent in all regions. Therefore, the expenditures in some basic headings were much more significant as a share of GDP in some regions than in others (the same was true for some economies within a region as well). As a result, the number of products specified under a basic heading could differ markedly from one region to another. For example, there were many more specifications for rice in Asia and the Pacific than in Latin America. One outcome was the need to balance the types of products within each region, so that all economies could price at least some products in each basic heading, was that some products defined were not representative, or even not available, within an economy. Clearly, products that were unavailable could not be priced. (The number of products specified in ICP Asia Pacific under each basic heading and the average number priced are presented in Appendix 2.)

Products for Government Final Consumption Expenditure and for Investment Goods

As already discussed, a different approach was adopted for products in GFCE, and investment in construction and equipment, with the Global Office defining the specifications. The issues in collecting prices were quite different from those for HFCE. The numbers of outlets selling investment goods were relatively limited compared with those selling consumer goods, and seasonality of prices was generally not an issue. Substantially fewer prices were collected for these types of products and the price collection was not spread on a quarterly basis. Similarly, the prices collected for the compensation of employees related to about 50 different types of jobs, although a requirement was that national annual average prices should be supplied.

Wage rates were used as the basis for a large part of the comparison of government expenditure. Details of a range of occupations covering all major types of government workers were set out to enable economies to price the wages for comparable workers. However, it proved necessary to make adjustments for productivity differences between some economies. (Details of the economies concerned, the methods used to make these productivity adjustments, and the effect of them are presented in Appendix 4.)

Linking Regional Results—The Ring Comparison

Background

Since 1980, the ICP has been run on a regional basis, with the 2005 ICP having six separate regions. The results produced for the economies within each of the regions have to be amalgamated into a worldwide set of consistent results so that any pair of economies in the world can be compared directly. In past rounds of the ICP, regions were linked by having an economy in one region price the products in another region's product list. In effect, this link economy participated in the ICP in both regions and so was able to provide a relationship between the pair of regions. The advantage of this approach was that it was relatively inexpensive overall, although the economies that provided the link between each pair of regions incurred the costs of pricing an extra set of products. The weakness, though, was that the reliability of the comparisons between the economies in any pair of regions was dependent on how well the link economy was able to price the other region's products and how representative the relationships calculated from the link economy were of all the economies in the pair of regions.

For the 2005 ICP, the link economy approach was used to link the Commonwealth of Independent States countries with the OECD/Eurostat group. The Russian Federation was used as the link economy and had to take part in both the OECD/Eurostat comparisons and the comparisons with other Commonwealth of Independent States countries.

For the other regions, including the OECD/Eurostat group, a new approach was adopted in the 2005 ICP, with 18 economies being used to link the regional groups together by running a "mini-ICP" worldwide to provide the relationships between each pair of regions. The linking process has become known as the "ring comparison" because the multilateral methods used effectively formed a ring in which the resulting regional links were transitive.¹⁹ In theory, it would be possible to run a ring comparison with

¹⁹ The Commonwealth of Independent States did not participate in the ring comparison. It was linked to the rest of the world by a simple link to the OECD/Eurostat results, which were integrated with the other regions via the ring comparison.

only one country from each region. However, this would expose the linking process to the same sort of weaknesses that led to the ring comparison being set up in the first place.

Criteria for Selecting Ring Economies

Ring economies should meet several criteria to participate effectively, but there is no need to have the same number of economies from each region.

The ring economies had to meet the following criteria:

- (i) having developed markets and an open economy;
- (ii) having a wide range of goods and services that were likely to be found in ring economies in other regions;
- (iii) able to participate in the full GDP comparison;
- (iv) having acceptable price data and expenditure weights;
- (v) able to derive national annual average prices; and
- (vi) willing to act as a ring economy.

The economies in the ring comparison are shown in Table 16.

The ring comparison was used to link PPPs between regions at both the basic heading and broader levels. The first step was to link the PPPs for each basic heading. Prices at the individual product level within each basic heading for each of the ring economies provided the starting point. The procedure used focused on calculating interregional PPPs rather

than PPPs for the individual ring economies. PPPs at the basic heading level for each region (rather than for the individual economies) were calculated using the CPD method. The EKS method was used for aggregation above the basic heading level.

Preparing the Product List for the Ring Comparison

As was the case for the regional comparisons, the product list (referred to as “the ring list”) for pricing by economies in the ring comparison was developed separately for HFCE and for the other major aggregates in GDP. The work on the product list was a joint exercise between the ring economies, the regional coordinators, and the Global Office. Broadly speaking, the product list for HFCE was an amalgam of the products that each ring economy had been able to price in its respective regional comparison plus a number of additional products that had been selected for basic headings that did not have sufficient products identified through the first step. SPDs were used extensively in matching products across regions (see the section above, “Structured Product Descriptions”). Similar products were often named differently in different regions and so the characteristics of the products were the most important means of identifying comparable products.

The product lists for the regional comparisons for the aggregates other than HFCE had been developed by the Global Office to be used worldwide. Some changes were made to cater for particular regional circumstances, but the regional lists matched very well across the regions, which meant these lists could be transformed into a ring list relatively easily compared with the process required for the lists for HFCE.

Two workshops were held at ADB headquarters for the four regional ring economies to finalize the ring list: 31 January–11 February 2005 and 28 June–2 July

Table 16. Ring Comparison Economies

Africa	Asia	Latin America	Western Asia	OECD/Eurostat
Cameroon	Hong Kong, China	Chile	Egypt	Estonia
Egypt	Malaysia	Brazil	Jordan	Japan
Kenya	Philippines		Oman	Slovenia
Senegal	Sri Lanka			United Kingdom
South Africa				
Zambia				

2005. The four economies indicated the availability of the products from the combined list built up from the product lists for the five ICP regions involved in the ring comparison. The four regional ring economies were requested to make a preliminary survey of the trimmed product list to determine the specifications and brands available in each economy. This information was used in the second meeting for preparing the region's final comments on the ring list.

In some cases, the prices collected by the ring economies for the regional comparison could also be used for the ring comparison. In most cases, though, extra prices had to be collected. The major challenge for the ring economies was to identify products that could be priced in the other regions but which were also representative of Asia and the Pacific. The trade-offs involved were more difficult to deal with than had been the case in the regional comparison. A data review workshop was held in June 2006 to systematically examine the prices collected for the ring comparison.

Purchasing Power Parities at the Basic Heading Level (interregional)

The first stage in obtaining worldwide results was to calculate PPPs for the ring economies at the basic heading level for Africa, Asia and Pacific, Latin America, OECD/Eurostat, and Western Asia. A separate pricing list was developed, although the focus was on having at least one economy within each region being able to price products in each basic heading, rather than every economy within a region being required to do so.

The relationships between regions, at the basic heading level, were established by first obtaining regional mean prices expressed in a regional numeraire currency (Hong Kong dollars for Asia and the Pacific). Representativity was important in identifying the products to price because having a preponderance of nonrepresentative products in a region would tend to bias its observed price levels upward. Regional average prices were calculated for each product for each region, expressed in a regional numeraire currency. Basic heading PPPs were then obtained for each region by means of the CPD procedure, which provided transitive PPPs. It was a similar process to that described above for calculating basic heading PPPs for economies in a region (see the earlier section "Purchasing Power Parities at the Basic Heading Level").

Purchasing Power Parities for GDP and its Major Aggregates (interregional)

The transitive interregional PPPs provided a measure of the relativities between each of the five regions in the ring comparison at the basic heading level. These relationships were applied to the results for each region obtained through each regional comparison.

The next step was to obtain the regional expenditure. Expenditures for each basic heading in local currencies were converted into the numeraire currency using the PPPs that had been calculated in the regional comparison and summed across all economies within the region to obtain the regional total expenditure in the numeraire currency. Effectively, this regional total for each basic heading is like an individual country's value expressed in its local currency.

The interregional PPPs were combined with the regional expenditure in the numeraire currency. The standard EKS aggregation procedure was used to obtain the interregional PPPs at levels above the basic heading. PPPs were produced for each of the five regions for GDP and each of its subtotals that were of interest. The outcome was PPPs that could be used in combination with intraregional PPPs to obtain the PPPs between any pair of countries in the world. As a result, the relationships between regions obtained through the ring comparison could be used to adjust the results from each region to a comparable level.

Fixity

Each region's results were subject to "fixity". The weighting and price patterns underlying spatial price indexes change as extra countries are included in the calculations because multilateral PPPs are based on the expenditure and price patterns of the countries included in the comparison. The precise effect of including additional countries in the comparison depends on the formula being used to aggregate basic heading data. In a large-scale undertaking like the 2005 ICP, with 146 economies participating, the project was organized on a regional basis, largely for practical reasons. The results for each of the six regions would potentially change if PPPs were calculated concurrently for all countries participating worldwide because of the different weights that would be used in the aggregation process. A method commonly used to prevent this change in the PPPs (and the potential change in economy rankings) is to apply *fixity* to the

regional results. The underlying principle is that the PPPs between economies (and therefore the volume relativities based on the PPPs) in a region do not change when the results from that region are combined with those from another region (or regions).

Fixity is an important subject in the 2005 ICP, given that the PPPs and associated data for each of the six regions were compiled and published independently of each other. In practice, it would be impossible to run a single comparison for all economies worldwide because the product lists, particularly those for household consumption, were developed separately for each region and so the product specifications for which prices were collected would not match across regions.

Tool Pack

The ICP Asia Pacific Regional Office used the software developed specially by the Global Office—“Tool Pack”—to transmit and process the ICP data. The Global Office’s aim in developing the software was to provide a single package that would store ICP data in a consistent format worldwide and enable PPP-based calculations and simulations to be run. Tool Pack included a database component for storing individual prices and national accounts basic heading data, and a data manipulation feature, which enabled data at all levels to be aggregated. For example, at the lowest level, Tool Pack could weight together the individual prices to national annual average prices for each product. At the highest level, it could aggregate basic heading PPPs to broader national accounts aggregates up to GDP itself, using one of a range of alternative aggregation methods. Tool Pack could also produce the Quaranta and Dikhanov tables (see the relevant sections in Part 4), which were very important editing tools since they provided the means to systematically edit data supplied by economies within each region.

Apart from the basic data input and transmission facilities used by individual economies, Tool Pack was designed to handle the various types of usage required by the different coordinating groups. The national coordinator in each economy could use Tool Pack to check on the individual prices collected within the economy, aggregate them to national annual average prices, check them using “diagnostic reports” (which provided information that was very useful in editing the prices both within and between economies), and then transmit the clean data to the Regional Office.

The Regional Office used Tool Pack in two broad ways. The first was for editing via the Quaranta and Dikhanov tables, both of which provided summary information in the diagnostic reports that enabled various edit checks to be carried out on the data for individual economies within a region, particularly comparing the distribution of their data with those for the region as a whole. The second key use of Tool Pack was after the data had been cleaned, to calculate PPPs for individual products, for basic headings and for various national accounts aggregates, including GDP. The effects of using different aggregation methods were tested as part of this process.

Tool Pack was developed in a flexible way, with statistical capacity building in mind, so it could be used for collecting and storing the data required for time-series price indexes, such as CPIs, as well as for PPPs. Tool Pack’s editing and aggregation facilities were also developed in a way that enabled them to be used for processing time-series price indexes so that it could handle all aspects of collecting, storing, editing, and aggregating time-series price data.

Several training workshops were held for Tool Pack. Aside from the regional training workshops, Tool Pack training was provided for the participating economies on request. As there were problems initially encountered in Tool Pack installation, the Regional Office provided both desktop and laptop computers to address compatibility issues.

As Tool Pack was a new software, the Regional Office, as well as the participating economies, experienced teething problems. This led to suggestions on improvements and revisions, such as the following: the batch upload utility function; data consistency; mismatch between Tool Pack and the product list; inclusion of a weighted averaging function in the data processing module; and facilitating data validation in the Quaranta tables. (More details about the background to these suggested improvements are presented in the section “Data Validation for ICP Asia Pacific” in Part 4, below.)

Some economies found Tool Pack useful while others made little or no use of it. This information obviously will be valuable in designing an updated version of the program for future rounds of the ICP. (In Appendix 3, participating economies describe in detail the problems encountered and the solutions they adopted for the 2005 ICP.)