

REGIONAL PROGRAM IMPLEMENTATION

ICP Asia Pacific Regional Activities

Introduction

The 2005 ICP was coordinated worldwide by the Global Office, while ADB was the coordinating agency for ICP Asia Pacific. The coordinating agency in each region had a large degree of autonomy in arranging its own activities, provided that it complied with the general guidelines drawn up by the Global Office. One of the first initiatives of ADB was to set up a governance structure, with the ICP Asia Pacific Regional Advisory Board overseeing the region's ICP activities (see the earlier section "Governance in Asia and the Pacific").

ADB was responsible for arranging the funding for ICP Asia Pacific. ADB provided seed funds to the national coordinating agencies in the participating economies but the agencies themselves absorbed a large share of ICP costs. ADB financed direct costs (travel, accommodation, etc.) of each economy's participation at various meetings, workshops, and training courses while in a few cases the national coordinating agencies were provided with additional funding for data collection costs and for in-country training.

Timeline

The initial planning for ICP Asia Pacific began in 2002, with work on the first stage (developing the product lists) starting in late March 2003. The release of this publication containing the detailed results for the Asia and Pacific region conclude ADB's direct involvement in the 2005 ICP. The final step is the release of the worldwide estimates by the Global Office, which is expected to be on 17 December 2007.

The major milestones for ICP Asia Pacific and their timing are set out in Table 17. (A detailed list of the key events is presented in Appendix 10.)

Data Editing and Validation Procedures

From the outset, the ICP Asia Pacific Regional Advisory Board emphasized that data quality was a paramount consideration. As a result, a large amount of the Regional Office's work involved managing the editing and data validation activities. Editing was an ongoing process from the time that the price data were first collected. The consistency of prices within localities and types of outlets was checked by the National Coordinators. At this stage, various teething problems were resolved, particularly incorrect units of measurement and different interpretations of the product specifications by price collectors. Once

price collection had been completed for the first quarter of 2005, data review workshops were held for participating economies to compare data. They provided an opportunity to resolve problems with product specifications, particularly regarding the consistency in the way in which they were interpreted in different economies. Later workshops focused more on data issues, with the consistency of price observations, both within and between economies, as the central focus.

Data Review Workshops

Conducting data review workshops was a critical factor in ensuring the quality of the regional comparisons. The aim was to identify errors in the data submitted to the Regional Office, resolve these data problems, and develop means of eliminating such errors in the future. The workshops also provided a forum for the economies to share details of the types of problems they had encountered in collecting data and the ways in which they had overcome them. In total, seven data review workshops were held to assess the quality of the price data supplied. In addition, four other workshops were held—one to check the consistency of the national accounts data, a second to check the prices collected by the ring economies for the ring comparison, and two to evaluate the preliminary results shortly before they were published.

Table 17. Milestones in ICP Asia Pacific

Date	Activity
November 2001	ADB was approached to coordinate ICP Asia Pacific
December 2002	Work plan prepared
February 2003	Invitations sent to ADB member-economies to participate in ICP Asia Pacific
June 2003	First meeting of the ICP Asia Pacific Regional Advisory Board
June 2003	Meeting of heads of ICP Asia Pacific national coordinating agencies
July/August 2003	ICP Asia Pacific Regional Inception Workshop
2005	Collecting prices for household consumption
2006	Collecting prices for investment
2006	Collecting prices for government consumption
June 2007	Seventh (final) meeting of the ICP Asia Pacific Regional Advisory Board
July 2007	Meeting of heads of ICP Asia Pacific national coordinating agencies
July 2007	Release of preliminary PPPs for the Asia and Pacific region
December 2007	Release of final PPPs for the Asia and Pacific region

The Regional Office adopted its own data validation procedures. For the household product list, a document on the price data validation procedure was prepared to assist the participating economies in their initial review of household price data prior to submission to the Regional Office. Some of the concerns they were advised to review were (i) price data with a coefficient of variation (CV—the standard deviation divided by the arithmetic mean) greater than 30%; (ii) that at least 15 price quotations were collected for each of the products priced; (iii) that minimum-maximum price ratios should be less than 0.33; and (iv) that the prices were national annual average prices. All these were consistent with the recommendations in the ICP Handbook. Any issues that the Regional Office identified were checked with the participating economies for confirmation that the data were correct or for them to take appropriate remedial action.

The first step in the review process was to compare the prices for each product within a basic heading using exchange rates to convert them into a common currency. It may seem counterintuitive to use exchange rates for this purpose, given that the ICP was established to overcome the problems inherent in using exchange rates to convert values into a common currency. However, PPPs would be affected by any problems in the prices on which they were based and so they could hide potential problems prior to cleaning of the basic price data. Once the major problems in prices had been resolved, the procedure was repeated using PPPs rather than exchange rates to finalize the editing process.

The Quaranta and Dikhanov tables proved to be very useful in the workshops (see the following two sections). They provided a systematic means of validating data and of identifying consistency problems with the prices reported. One of the most important aims of the data review workshops was to ascertain the reasons for major price variations between economies for the same product. In most cases, they turned out to be attributable to ambiguity in the units of measurement, different interpretations of loosely defined product specifications, or incorrect survey operations. In some cases, though, apparent data problems (such as large price differences) turned out to be due to differences in the economic structures or institutional arrangements between economies.

Five data review workshops were held for household consumption products in 2005 and 2006 to check the quality and consistency of price

data. Some of the data review workshops were split so that groups of economies with similar economic or geographic characteristics attended separate workshops covering the same datasets. The aim was to make it easier to identify and discuss problems by having small groups of like economies together. Findings from the data review workshops revealed problems related to product specifications. In cases where no specific brands were mentioned, a mixture of high- and low-quality products was often priced. Product specifications proved to be quite difficult for a few products, such as ladies' handbags, leather wallets, and watches. For some products, wide price variations stemmed from differences in the interpretation of the product specifications for a shirt, such as "businessmen's, 50–100% cotton" because there is a large price difference between a 50% and a 100% cotton shirt. Language problems also resulted in pricing some nonsimilar products. A "blouse" in the South Asian context is different from elsewhere. It was also observed that using varied reference quantity ranges for some packed products also led to large price differentials. The quantity range is an important price-determining factor as the price of 250 grams of margarine derived from a reference quantity of a 200–300 gram tub would be different if the price were calculated for 250 grams from a 1 kilogram tub. The numbers of products priced under each basic heading for which data were provided were also checked.

Other sources of variations were in the implementation of the ICP price surveys. Quotations were collected mostly from high-end outlets in a few participating economies. The treatment of services that were provided free of charge in some cases but charged for in others, e.g., withdrawing cash from an automated teller machine, was problematic. Issues also arose with an unreasonably low sample size: fewer than 15 price quotations were provided in some cases, even for products for which it was reasonable to expect collection of at least that number of prices.

The product priced may have varied in quality when the brand was not specified or the brand priced was not the specified brand. In some cases, the observed quantity was outside the quantity range specified or the unit of measurement was different from that in the product specifications. High divergences in prices across quarters for the same product within an economy also led to queries.

Some important outcomes from the data review workshops were that the product specifications were revised in some cases, products were deleted from

the list from time to time, and some new products were added. Occasionally, a single specification was split into two separate specifications when it became apparent that different economies had priced products that fell into two separate, identifiable categories (within the product specification).

As a result of the workshops, eight products were expanded, resulting in an additional 17 products; clarifications or modifications were made for 170 products; and 104 products were deleted. Ultimately, 656 products were included in the household product list for PPP computation.

The Regional Office, in consultation with participating economies, checked the representativity of the products priced. Representativity is a difficult concept to define precisely as different people will interpret it in different ways. Initially, the aim was to use a method to calculate the basic heading PPPs that would explicitly take representativity into account in the calculations. It is a variation of the CPD calculation method and is referred to as the country-product-representativity dummy (CPRD) method (“R” standing for “representativity”). However, investigations showed there was a lack of consistency between economies in declaring products as representative or nonrepresentative. As a result, it was not possible to use the CPRD method, and CPD was used instead. However, it was critical to identify any nonrepresentative products that were extreme outliers (e.g., products with “prestige labels” that are sold in very small numbers at high prices) because they would bias the results unless excluded.

The Regional Office also developed “What to Price Guides”, which clarified several issues identified by the data review workshops as having led to inconsistent prices. The guides concentrated on the units of measurement and the quantity ranges that were acceptable for pricing each particular problem product. An additional guide (“List of Products Needing Special Attention”) was prepared to explain in detail the problems faced in pricing 59 products that had been identified as being particularly problematic. With the main objective of ensuring accurate product identification, the Regional Office also prepared a printed product catalogue, including photographs of the products, which it distributed to the participating economies.

Quaranta Tables

Quaranta tables provide general information relating to each basic heading and a summary of the characteristics of each product within the basic heading. They were named after Vincenzo Quaranta, from the Italian National Statistical Office, who developed them in 1990 to assist in editing the PPPs produced in the OECD/Eurostat PPP program. Quaranta tables show details of the product, the reference period, the mean, the highest and lowest observations, PPP, PLI, exchange rate, weight, and CV for each product within a basic heading, for each economy. They also provide summaries for basic headings. The following paragraphs discuss both summary and detailed Quaranta tables.

The first example of a Quaranta table (Table 18) presents details at the basic heading level. In this example, all 23 economies are included and the base economy is economy A. As a result, the exchange rate and the PPP for economy A are both equal to 1.00, while the PLI for economy A is 100.0. The weight is the basic heading’s share of GDP in each economy, expressed on a base of 10,000. The column headed Products shows the number of products priced by each economy in the basic heading and the figure preceded by the asterisk (*) is the number of those products priced that are considered to be representative in the economy. The CV is the ratio of the standard deviation of all the price observations for each of the products in the basic heading in each economy divided by their mean, averaged across the products in the basic heading and then expressed as a percentage.

The second example of a Quaranta table (Table 19) presents details at the individual product level; in this case it relates to chocolate bars. The second column shows the average price observed for the chocolate bars, expressed in each economy’s local currency, with the third column showing the number of price observations on which the average is based. The fourth column is the CV (i.e., the standard deviation divided by the mean of the price observations, multiplied by 100 to express it as a percentage). The fifth column is the average price adjusted to a common currency via exchange rates, with economy A as the base economy. The sixth column is the ratio of the exchange rate-based price in each economy to the geometric mean of this price for all economies, expressed on a base of 100. It is a measure of the dispersion of the price levels for a

Table 18. Quaranta Table Diagnostics—Filters: Confectionery, Chocolate, and Other Cocoa Preparations

Basic Heading Code	1101183	Time Period	June-05	Run Date		
Scope of Coverage	Economy	Upper Bound	150	Lower Bound	50	
Averaging Method	Arithmetic Mean	Imputation	CPD			
Price Attributes	National Accounts					
Location Attributes	National Accounts					
Product Attributes	National Accounts					
Summary Information						
No. of Products in the Analysis	5 out of 5	Average Weight of Basic Heading in Total Expenditure			26.3	
No. of Economies in the Analysis	23 out of 23	Average Coefficient of Variation			32.1	
Base Economy	A					
Economy-level Details						
Economy	Exchange Rate	Purchasing power parity	Price level index (%)	Weight	Products ^a	Coefficient of Variation
A	1.00	1.00	100.0	7.6	5,*4	36.8
B	159.86	139.64	87.3	21.0	4,*4	23.2
C	3.45	2.24	65.0	9.6	3,*2	38.9
D	0.130	0.135	104.0	22.3	5,*2	37.5
E	207.24	134.53	64.9	16.3	5,*5	32.3
F	0.64	0.62	97.6	8.9	5,*5	39.2
G	0.13	0.21	156.8	63.9	4,*4	20.6
H	5.58	4.94	88.5	27.5	4,*2	36.4
I	3.45	2.95	85.8	28.1	3,*2	27.9
J	2.51	3.14	124.8	33.7	5,*5	24.4
K	236.75	95.03	40.1	50.1	2,*1	18.9
L	0.13	0.17	129.3	20.3	4,*4	39.1
M	0.62	0.79	126.5	21.2	5,*5	41.7
N	0.89	0.76	85.9	30.7	5,*5	20.0
O	5.03	5.94	118.1	7.8	4,*4	8.5
P	94.16	70.52	74.9	70.0	4,*4	38.8
Q	151.64	127.26	83.9	74.3	5,*5	34.5
R	4.65	3.62	77.9	24.0	5,*2	20.7
S	4.30	2.89	67.1	12.4	4,*4	37.3
T	0.61	0.83	135.7	19.8	5,*5	33.8
U	7.85	5.64	71.8	15.8	4,*2	71.8
V	3.14	3.03	96.6	10.9	5,*5	37.7
W	166.49	127.13	76.4	9.8	3,*3	18.9
Mean				26.3		32.1

a See text.

Table 19. Quaranta Table—Item-level Details

Product Code	Chocolate Bar - Plain				Base Economy A			
1101183011					Coefficient of Variation			24.0
Economy	Price (Local Currency)	Number of Price Quotations	Coefficient of Variation	Exchange Rate Price	Exchange Rate Ratio	CUP Price	CUP Ratio	Preferred Unit of Measurement
A	6.609	55	8.8	6.61	129.0	6.61	116.1	50 - grams
B	293.000	102	10.1	1.83	35.8	2.10	36.8	50 - grams
C	11.200	45	13.4	3.25	63.5	5.00	87.9	50 - grams
D	2.042	185	8.2	15.71	306.6	15.10	265.2	50 - grams
E	816.700	216	18.6	3.94	76.9	6.07	106.6	50 - grams
F	6.571	585	27.0	10.26	200.4	10.52	184.7	50 - grams
G	1.607	147	14.4	12.16	237.4	7.76	136.2	50 - grams
H	22.352	200	22.9	4.01	78.3	4.53	79.5	50 - grams
I	16.504	985	16.9	4.79	93.5	5.59	98.1	50 - grams
J	20.541	60	6.3	8.17	159.6	6.55	115.0	50 - grams
K	230.120	118	21.6	0.97	19.0	2.42	42.5	50 - grams
L	1.101	168	9.9	8.47	165.3	6.55	115.0	50 - grams
M	6.574	87	5.7	10.53	205.7	8.33	146.3	50 - grams
N	2.016	85	5.3	2.27	44.3	2.64	46.4	50 - grams
O	34.418	632	5.4	6.85	133.7	5.80	101.8	50 - grams
P	196.439	66	13.3	2.09	40.7	2.79	48.9	50 - grams
Q	412.110	50	24.2	2.72	53.1	3.24	56.9	50 - grams
R	27.748	970	25.1	5.97	116.5	7.67	134.6	50 - grams
S	27.970	243	14.1	6.50	126.9	9.68	170.0	50 - grams
T	6.673	82	13.2	10.97	214.1	8.08	142.0	50 - grams
U	26.400	233	9.0	3.36	65.6	4.68	82.2	50 - grams
V	21.263	348	25.8	6.77	132.1	7.01	123.1	50 - grams
W	76.890	97	31.2	5.87	114.6	7.68	134.9	50 - grams
Geometric Mean				5.12		5.69		

CUP = conventional unit to express parity.

product in the different economies and indicates those economies whose prices need to be checked for possible errors (e.g., economy D has a very high conventional unit to express parity (CUP) price ratio and economy K has a very low one). The CUP price is the price in local currency for each economy adjusted to a common currency using the PPP for the basic heading to which this product belongs. The CUP ratio is the ratio of the CUP price for each economy to the geometric mean of the price for all economies, expressed on a base of 100. It provides a view on the variation of price ratios for different products within a basic heading (a similar, but by no means identical, view to the exchange rate ratio in the sixth column).

The Dikhanov Table

The Dikhanov table (Table 20) was an innovation introduced to assist in editing prices collected for the 2005 ICP. It shows the relationships between product prices across basic headings up to the level of GDP for each economy in a region. The Dikhanov table uses the CPD model as the basis for analyzing the price data and it shows the distribution of the prices actually provided by an economy compared with the prices estimated by the model. The difference between the observed and estimated price is an analogue of the CUP indexes used in the Quaranta tables. Large differences between the

Table 20. Illustrative Dikhanov Table—Household Final Consumption Expenditure Products

		Economy A	Economy B	Economy C	Economy D
Purchasing Power Parity		5.22	4.72	0.391	47.0
Standard Deviation		0.467	0.390	0.462	0.387
Number of Items Priced		553	414	446	471
Exchange Rate (local currency per US dollar)		43.28	37.12	1.82	400.2
Exchange Rate (local currency/regional base economy)		6.99	6.00	0.294	64.7.
Price Level Index		74.7	78.7	133.0	72.6
Product code	Product name				
1101110118	Premium rice #1	0.33	0.02	-	-0.22
1101110119	Premium rice #2	0.11	-	-	-0.69
1101110120	Premium rice #3	0.15	-	-	-0.47
1101110121	Premium rice #4	0.08	-	-0.47	-
110111018	White rice #1	0.45	-	-	-0.08
110111019	White rice #2	0.08	-	-	0.01
110112011	Wheat flour prepackaged	-0.26	-0.29	0.23	0.29
110112016	Corn flour prepackaged	0.78	-	-0.18	-
110112017	Rice flour	-	-	-0.34	0.11
110112021	Cake mix	0.13	-	0.03	0.30
110112031	Oats	0.50	-	-0.29	-
110112032	Cornflakes	0.40	0.49	-0.29	-
1101161031	Apples medium	0.18	-0.23	-0.11	-0.09
1101161072	Mango	-0.03	-0.13	0.51	-0.00
1101161073	Pawpaw/papaya	0.01	0.10	-0.16	-0.15
1101161074	Pineapple	-0.38	-0.03	-0.10	-0.26
1101161081	Watermelon	-0.01	-0.17	-0.10	-0.08
1101162021	Roasted Peanuts	-0.27	-	-0.09	0.15
1102211011	Cigarettes international brand	-0.05	0.69	-0.21	-0.23
1102211012	Cigarettes local brand	-0.77	0.40	-	-0.83
1103111011	Shirt fabric cotton polyester	0.31	0.56	-0.30	0.01
1103111014	Dress fabric Chinese silk	0.42	0.19	-	0.17
1103111015	Suit fabric wool blend	-0.19	-0.24	-	-0.06
1103111041	Handkerchief men's	-0.16	-0.19	0.17	0.74
1103111051	Belt men's	0.04	-0.11	0.48	0.22
1111211023	2 star hotel room	-0.05	0.61	0.03	-0.25
1111211024	Budget hotel (zero star)	0.08	-0.16	-	-0.03
1112111017	Women's basic haircut	-0.53	-0.29	0.58	-0.14
1112111019	Women's style cut with shampoo	0.08	0.06	0.54	-0.11
1112111023	Child basic cut no shampoo	-0.29	-0.37	-0.20	-0.51
1112111025	Men's basic haircut	-0.37	-0.53	-0.12	-0.45
1112121011	Hair dryer	-0.11	0.31	-0.66	0.09
1112121021	Shampoo	0.35	0.73	-0.31	-
1112311101	Wall clock	0.16	-0.86	-0.16	0.03
1112321011	Men's wallets	-0.27	-0.43	0.51	0.17
1112321031	Women's handbags	-0.38	0.10	-0.41	-0.18
1112321061	Travel bag (Samsonite, Polo or VIP)	-0.24	-0.20	-0.70	-
1112321063	School bag	-0.02	0.20	0.01	0.01

Table 20. Illustrative Dikhanov Table—Household Final Consumption Expenditure Products (continued)

Economy E	Economy F	Economy G	Economy H	Economy I	Standard Deviation	No. of Products Priced
1.00	0.346	1.59	3.69	122		
0.546	0.445	0.501	0.425	0.462	0.453	
558	456	543	581	620		688
6.19	1.53	6.58	32.3	940.7		
1.00	0.247	1.06	5.22	152		
100.0	140.1	150.0	70.7	80.3		
-0.10	-	0.05	-	-0.40	0.256	11
-	-	0.07	0.35	-	0.450	12
-	-	-	-	-	0.371	4
-	0.05	0.11	0.31	0.15	0.383	13
-0.11	-	-	-	-	0.254	9
-	-	-	0.18	-	0.122	7
-0.08	-0.39	0.29	-0.22	-0.08	0.340	23
-0.75	0.47	-0.35	-	-0.16	0.378	17
0.38	0.01	-0.31	-0.28	-0.04	0.348	17
-0.23	0.09	0.16	-	-0.04	0.231	19
-0.34	-0.63	-0.11	0.32	0.19	0.445	17
-1.68	0.22	0.0	-0.48	-0.10	0.539	21
-0.53	0.18	-0.26	0.09	0.31	0.276	22
0.52	-	0.10	-0.47	-0.74	0.411	20
1.17	-0.36	0.86	-0.30	-0.88	0.471	21
0.03	-0.28	0.47	-0.08	-0.71	0.547	22
0.18	0.32	0.32	-0.46	-0.58	0.322	23
-0.15	-0.10	-0.25	-0.26	0.10	0.205	22
0.27	-0.04	0.46	0.27	-0.69	0.432	22
0.25	-	0.79	0.54	0.03	0.689	19
-0.16	-0.70	-0.27	0.24	-0.25	0.437	23
-	-	0.38	-0.89	0.47	0.406	19
0.37	-0.63	-0.03	0.75	0.39	0.415	19
0.67	-0.76	0.36	-0.55	-0.26	0.425	22
-	-0.58	-0.08	-0.00	-0.07	0.338	21
-0.14	0.39	-0.41	0.22	-0.20	0.382	21
-0.10	1.08	-	-0.22	0.31	0.376	16
-0.16	0.40	0.76	-0.22	-0.39	0.448	21
-0.19	0.18	0.58	-0.26	-0.70	0.426	23
0.15	0.20	1.26	-0.54	-0.38	0.602	21
0.15	0.16	1.28	-0.62	0.20	0.613	22
0.11	0.61	-0.30	0.45	0.13	0.373	23
0.00	-0.14	-0.29	0.32	-0.27	0.285	22
0.92	-	-0.23	-	0.32	0.381	17
-	0.22	0.24	-0.45	0.42	0.358	20
-	-0.92	0.35	-0.21	0.15	0.453	20
1.08	0.55	-0.22	0.12	-0.51	0.548	20
0.88	-0.61	-0.16	0.08	-0.03	0.322	23

observed and estimated prices can indicate potential problems with the consistency of the prices collected for a product within an economy or the possibility that an economy is not pricing the same product as the other economies.

The above Dikhanov table (Table 20) is presented for illustrative purposes and shows data for nine economies rather than the 23, and presents only a small proportion of the products actually specified for the region. In the Dikhanov table used in practice, the products were grouped by basic heading.

Columns 3 to 11 show the results for each of the nine economies, while the last two columns show the regional standard deviation and the number of products priced in the region. The body of the table shows the residuals for each product in each economy, calculated as the difference between the observed price and the price estimated using the CPD model (in logarithmic terms). Any residual greater than 0.25 is highlighted in yellow, while any greater than 0.75 is highlighted in red. Black shading was used for residuals greater than 2.00, although they rarely occurred.

The first six rows below the heading row present summary data (PPPs, exchange rates, etc). The PPPs in the first row are those calculated by applying the CPD method to all products from all economies in the region. The standard deviations in the second row are those for the residuals for each economy, while the second to the last column in the second row shows the overall standard deviation of the residuals in the region. The final column shows the number of economies pricing each product, with the number in the third row of that column being the number of products priced in the whole region.

Data Validation for ICP Asia Pacific

One of the most important processes in ICP Asia Pacific was checking the prices and national accounts data to ensure reliability. This section describes the data validation procedures used in ICP Asia Pacific to ensure the comparability and reliability of price data collected by the participating economies. In addition to the Quaranta and Dikhanov diagnostics for data validation, the Regional Office developed and implemented other data validation procedures. There were two distinct stages in data validation—the first was the *intracountry* validation process, in which the individual price observations were edited and

checked and also where the first checks were carried out on the average prices; and the second was the *intercountry* validation process, in which the average prices for the same products in different economies were checked against each other. While there is an attempt to describe separately the procedures adopted by the Regional Office, intercountry and intracountry data validation processes are interdependent.

Intracountry Data Validation for Household Products

Formulation of a Price Data Validation Procedure for Economies

Initial submission of price data revealed significantly high CVs in spite of the facilities available for data validation in Tool Pack and the guidelines provided by the Global Office. To further assist participating economies in conducting their respective data validation, the Regional Office prepared and circulated both hard and soft copies of the “Price Data Validation Procedure for Countries” for validating and reviewing their templates and raw price data prior to sending their data to the Regional Office. It suggested a number of points to check in validating data (e.g., a minimum number of prices to be collected for a product; data validation to be undertaken as soon as possible after the price surveys; and limits on their variability) and the courses of action to be followed when potential problems had been identified.

Economies were also strongly advised to price products within the quantity range as specified and that the correct unit of measurement and the preferred quantity were followed. For consistency across economies, they were also advised to price medium-quality products when the brand was not specified, and to use outlets frequented by many people.

Development of an Automated Country-level Data Validation Procedure

To accelerate intracountry data validation, the Regional Office developed an automated system that involved the extensive use of Microsoft Excel features such as macros, auto filter, and Visual Basic programming. It had two subroutines: the first automatically created summary information from a template generated in Tool Pack, while the second processed raw price data.

Information from the Tool Pack template included the total number of products priced, a list of products with fewer than 15 quotations, and a list of products with CVs greater than 30%. These were validated against individual price data to ensure consistency between the template and the unit-level data. The individual price data subroutine identified specific sources of errors such as products with zero values in the observed/converted price; products with fewer than 15 observations; and minimum-maximum price ratios less than 0.33. (A “converted price” is the price for the required quantity based on product specifications.) Further checking was done to ensure that products priced were within the specified quantity range which was allowed to take on values within 10% or 20% extension in range (e.g., if the quantity range is 300–500 grams, the 10% extension range would be 270–550 grams) in consideration of different national practices. The products collected from very high-end outlets were reviewed for representativity. Economies were also reminded to choose medium-quality products/items when the brand was unspecified and that a product/item that was rarely locally available did not have to be priced, as this might have distorted the price level.

Quarterly Validation

Applying the guidelines and the methodology as described in the previous subsection, Table 21 was generated and sent to the participating economies when data validation for the first quarter data was completed. The “Excel reference sheet” shows the products for review.

As data validation progressed, and as more quarterly data became available, additional data validation procedures were adopted. The concept of interquarter comparison became necessary. While identifying the criteria for outliers for interquarter

data validation, the Regional Office considered the average inflation rate across economies in deciding the range for identifying outliers. In addition, the data validation report sent to the participating economies became more detailed over time. It classified the products that needed to be reviewed with regard to the following concerns:

- (i) **Products with price ratios exhibiting high divergence.** These were selected when the average price ratios between quarters were outside the defined range of 80–125%, or in some cases when the CVs across quarters exhibited a wide range.
- (ii) **Products with high CVs for at least two quarters.** Unless the economies provided the reasons for high CVs, the Regional Office raised this issue with them.
- (iii) **Some representative products with less than 15 price quotations.** Representative products should be commonly available in the economies. Thus, economies should be able to provide at least 15 price quotations.

Adequacy of the Number of Products Priced per Basic Heading

The structure of the GDP expenditure weights shows the importance of each particular basic heading to the consumption patterns of a particular economy. Therefore, basic headings with significant weights need to be properly represented through the number of products priced per basic heading. However, it was also possible that even with a significant weight in their GDP structures, some economies could not price enough products—or even any at all. The Regional Office also reviewed this concern and classified its findings into three major groups.

Table 21. Sample Validation Concerns

Validation Concern	Number	Name of Excel Reference Sheet
Products Priced	434	All
Products with Less than 15 Observations	120	Observations less than 15
Products with Minimum/maximum Ratio of Less than 0.33	5	Min/Max ratio less than 0.33
Products with Coefficients of Variation (CV) Greater than 30.0%	7	CV greater than 30%
Total Number of Quotations	4710	All

- (i) **Not priced but with GDP weights.** Ideally, economies should be able to price products where they have GDP weights. However, they were requested to document items in the product list that were “not available” and advised to collect prices for more products under basic headings with GDP weights of at least 0.5%, where possible.
- (ii) **Priced but without GDP weights.** First, the economies were requested to confirm whether: (i) there is really no expenditure for the basic heading, (ii) the basic heading weight is zero due to no data being available and therefore the economy is unable to estimate the expenditures, and (iii) the weight is zero only because the weight is very small (almost zero).
- (iii) **Not priced and without GDP weights.** Economies were asked to confirm that the GDP weight for the basic heading was really zero and so products under that particular basic heading need not be priced.

Intercountry Data Validation for Household Products

Comparison of Exchange Rate Prices

The Regional Office computed CVs of the average exchange rate prices for each of the products for all participating economies, and subregional groupings were computed to identify outliers of the exchange rate prices. (Exchange rate prices are prices converted to the numeraire currency, the Hong Kong dollar, via market exchange rates.) If the CVs based on prices of all the economies were found to be extremely high, but the subregional comparison yielded an acceptable CV, then the economies were not requested to review their average prices anymore. However, if the CVs were high in both the overall and subregional comparisons, the economies with prices deemed to be outliers were requested to review and validate their average prices. A subregional comparison was carried out for better comparison in similar economies. The list of products to be reviewed as a result of the intercountry data validation was provided to economies in a separate Excel sheet to make a clear distinction of the list of products that needed to be reviewed based on intracountry and intercountry reviews by the Regional Office.

For the purpose of intereconomy data validation, the subregional groupings were as follows:

- (i) **High Income:** Brunei Darussalam; Hong Kong, China; Macao, China; Singapore; and Taipei, China.
- (ii) **Southeast Asia:** Cambodia, PRC, Fiji Islands, Indonesia, Lao PDR, Malaysia, Mongolia, Philippines, Thailand, and Viet Nam.
- (iii) **South Asia:** Bangladesh, Bhutan, India, Islamic Republic of Iran, Maldives, Nepal, Pakistan, and Sri Lanka.

Data Review Workshops

Consistent with the Regional Advisory Board’s recommendation on data review workshops to improve quality and comparability of data within the region, five such workshops were held for the household consumption list. The concept of these workshops was inspired by Latin American experience. Based on the findings and agreements of the data review workshops, economies were requested to revalidate their observations and make the necessary updates. Products that were difficult to price either because they were hard to find or simply did not exist in many economies were deleted from the list.

Preparation of “What to Price” and “List of Products Needing Special Attention” Guides

During the data review workshops, problems were identified relating to the correct product identification as well as the correct entry for the observed quantity. In this regard, “What to Price” guides were prepared for price data entry in Tool Pack. In addition, the Regional Office prepared a separate guide, “List of Products Needing Special Attention”, for 59 problematic products. Problems encountered in pricing these products were mainly due to ambiguous units of measurement or differences between preferred quantities in the Tool Pack and the product catalogue, or where a new approach for pricing was adopted after the initial ICP surveys (e.g., from “renewal of registration of an 800 cc vehicle” to “registration of a new 800 cc vehicle”). Additional products were identified using statistical parameters such as high CVs in the basic headings from the Quaranta table and high residuals using Dikhanov tables. Economies were advised to review the prices of these products as well.

The more common data problems identified during the intracountry and intercountry data validation can be split broadly into those that arose from difficulties with the product lists and those related to price collection and entering the price data into Tool Pack. The main problems with the product lists were misinterpreting the product specifications (some were not specific enough to ensure consistency while others used terminology that was interpreted differently in different parts of the region), not specifying a reference quantity range, and a mixture of high-and low-quality products being priced when brands were not specified in the product description. The main price collection and data entry problems included the following: too many products being priced in high-end outlets, product specifications not being followed completely, data entry errors, unit price conversion errors, insufficient number of prices collected for some products, inconsistent prices for a product across quarters, and wide dispersion in the prices collected for a product (i.e., high CVs).

Data Validation for Compensation of Government Employees

Compensation data were requested for some 50 government positions. Not all positions were expected to be available in all participating economies, but all economies nevertheless were requested to provide data for the maximum possible number of positions.

Several steps were followed for data validation for the sector. First, basic entries such as the number of working days and number of holidays were checked for a certain level of consistency across economies.

Checks were made for consistency of reported compensation within each major occupation group, e.g., health services, education services, and defense services. Within health services, a doctor, head of department is expected to have lower compensation than the hospital chief executive within an economy.

The most common areas needing clarification were: determining the correct position equivalent to that described in the position description; determining the level of seniority for each position; determining the allowances that should be reported; and reporting on the number of working days/hours for different occupations (for example, working hours for policemen/firemen are not the same as for other

occupations). After the data were reviewed by the Regional Office, it became apparent that there were huge productivity differences between the higher- and lower-income economies in the region. As a result, it was necessary to adjust wages data to take account of these differences. A detailed description of the background to the productivity adjustments and the way in which they were calculated is presented in the section below, “Procedures Used for Dwelling Rents and Government Compensation of Employees”.

Data Validation for Construction

The ICP requires items included in the construction comparison to be comparable across participating economies, and to be commonly found in the domestic markets of the economies. However, both conditions are often difficult to satisfy for construction, with the result that the sector is described as “comparison resistant”. Previous ICP rounds followed the standard projects-based method, using a selected set of standard hypothetical model construction projects. While the prices reflected full market (purchaser) prices that were consistent with prices used in the national accounts, and the methodology satisfied comparability, the disadvantage was that representativity had to be sacrificed. The standard projects-based method was considered to be expensive and difficult to implement in developing economies due to its detailed and comprehensive data needs and its high survey costs.

Largely for expense reasons, the basket of construction components (BOCC) approach was introduced in this ICP round. It divides the three construction basic headings—residential construction, nonresidential construction, and civil engineering works—into several systems that are in turn disaggregated into well-defined construction components. It involves pricing identifiable, complete, installed construction components. Prices were collected for 11 basic inputs and 23 composite components. Examples of components include a reinforced concrete column, or painting 100 square meters of a building’s exterior surface. BOCC requires all economies to price the same construction components, but an advantage of the BOCC approach is that it allows economies to vary the mix of inputs in line with their building practices and relative input costs.

BOCC strikes a balance between representativity and comparability—it simplifies the technical aspects of the survey procedures and it is less expensive to implement than the standard projects-based method. BOCC enables components to be set up in such a way that they are more comparable between different economies, while still being reasonably representative of actual building projects in those economies. Also, prices can be collected fairly readily in multiple cities and towns throughout each participating economy to obtain better national average prices. The major shortcoming of the approach is that the margins applying to the overall project, particularly profits for the whole project (as distinct from those at the individual component level), are not incorporated in the final quoted price. Such margins can fluctuate significantly, depending on market conditions in the pricing period.

The economies were advised to engage the services of domestic experts for the construction price surveys since most NSOs do not have expertise in this sector. The Regional Office undertook data validation with technical guidance from both international and domestic experts. Initially, the Regional Office convened the core group of experts on construction to undertake a preliminary review of price data prior to the regional data review workshop to which all economies were invited. The core group members (Hong Kong, China; India; Malaysia; Mongolia; Philippines; and Viet Nam) were selected from the domestic experts based on their inputs in the construction product list finalization workshops. An expert's view from the private construction sector in Malaysia was also provided in the second core group meeting. The economies were requested to review their prices based on the initial comments of the core group and the revised data were used during the first regional data review workshop for construction conducted under the technical guidance of the international construction experts, who also reviewed the price data against the row-wise and column-wise geometric means in addition to the validation procedures followed by the Regional Office.

Intercountry comparison of the shares within the components was also evaluated on a subregional basis on the assumption that neighboring economies might be using similar technology. At the same time, the prices were compared against the average of the subregion to which an economy belonged. Another approach was to check the component prices against the basic input prices. However, quality issues affected the construction price data, even after the regional data

review workshop for construction. A second meeting of the core group was convened to take a final look at the data. This time, economies were not grouped on a subregional basis, which had been the case in analyzing the prices at the data review workshop. Rather, prices were compared across all economies for basic components grouped together on the basis of using similar technology, construction processes, and inputs.

The BOCC approach uses three types of expenditure weights: (i) W1 or weights for aggregation of the three basic headings—residential construction, nonresidential construction, and civil engineering works; (ii) W2 or weights for aggregation of systems; and (iii) W3 or weights at the component level. The W1 weights are the expenditure shares from the national accounts and the W3 weights were set at unity, meaning that all components within a single component system were given equal weights. The participating economies were asked to estimate their own W2 weights. However, in view of the difficulties faced by some economies in providing W2 weights, the geometric means (excluding outliers) of the W2 weights based on the data submitted by a majority of the economies were used in the ICP Asia Pacific PPP computation.

Data Validation for Equipment

As was the case with construction prices, most NSOs did not have much expertise in pricing equipment. As a result, they generally used the services of experts to collect prices. The Regional Office undertook data validation with technical guidance from both international and domestic experts. Initially, it convened a core group of experts on equipment to make a preliminary review of the price data prior to the regional data review workshop. The core group members from Bangladesh; Cambodia; India; Malaysia; Nepal; and Taipei, China gave their initial comments on the equipment price data submissions. The first regional data review workshop for equipment was conducted under the technical guidance of an international equipment expert. The first core group meeting was held in conjunction with a video conference with an international equipment expert.

Data validation for the equipment sector was not straightforward because the economies were left to decide on pricing unspecified alternates if the preferred or specified alternates were not available. However, in a few cases, even what were identified

as preferred or specified alternates did not exactly match the required specifications, with the preferred products as priority for pricing. If both models were unavailable, unspecified alternates were priced but the key identifying characteristic were noted very clearly. To address this issue, the international consultant determined if the models/products priced were equivalent or not to the specified models, and at the same time commented on the prices reported.

A second core group meeting was organized to further ensure product parity. With the revised responses, products were then grouped by the international expert based on the product specifications. For some products, as many as three groups were formed.

The number of products priced within each equipment group was checked and economies were advised to increase product coverage where possible.

Data Validation for Dwellings

Two methods can be used to obtain PPPs for the basic heading of actual and imputed rentals for housing. The first method, the “modified SPD method”, was recommended for use where regular surveys of rents were carried out in most parts of the economy. However, only Hong Kong, China; Malaysia; and Philippines have regular rent surveys with sufficiently broad coverage to use the modified SPD method. An attempt was made to use this method in these three economies, but this was abandoned when the classifications of dwellings they used could not be matched.

The second method is the “quantity approach”. It involves calculating a volume index for each economy that takes account of both the quantity of dwellings and their quality. The quantity is measured by, in order of preference, usable floor space, number of rooms, or number of dwellings. The quality is measured by availability of electricity, inside water, and private toilet.

Initially, data were checked for completeness and consistency. Among the quantity indicators, all economies were able to provide the number of dwellings, but the usable floor space and number of rooms, which are better quantity indicators than the number of dwellings, were unavailable in some economies. The data review workshops showed that

there were several misunderstandings regarding the quality indicators—in particular what was meant by “inside water” and “private toilet.” For these reasons, this approach, too, could not be implemented. The Regional Office therefore considered a “reference” method as a fall-back solution. (See the section below, “Procedures Used for Dwelling Rents and Government Compensation of Employees” for details.)

Validation of GDP Weights

The Regional Office reviewed the initial GDP data submissions and found that some had gaps in the data, while others suffered from data consistency problems. Among them were: not providing disaggregations by basic headings; reverse mathematical operations being done; and subcomponents not adding up to totals.

These were communicated to the economies for appropriate action. The revised GDP weights were then evaluated with some of the analysis being based on subgroups of economies. Outliers were identified mainly through examination of values outside a range of plus or minus two standard deviations from the mean. Several iterations were generally required as the data were cleaned progressively.

The steps enumerated above were first carried out simultaneously on all the economies that submitted GDP values. However, the Regional Office decided that subgrouping would bring about a more meaningful analysis. It originally grouped the economies by subregion but later determined that, since not all the economies in the respective geographic subregions were at the same level of economic development, comparison of the GDP structure would be more appropriate if the high-income economies were grouped together.

Aside from the validation of low and high values, the economies were also requested to confirm where weights were zero or almost zero, based on the following: (i) there was really no expenditure for the basic heading, (ii) the basic heading weight was zero since no data were available and therefore the expenditures could not be estimated, and (iii) the weight was shown as zero only because the weight was very small.

Another procedure adopted was to match the basic heading with weights against the list of products

priced by each economy. If there were products priced but no corresponding weight for the basic heading under which the products were classified, a request was made to estimate the basic heading weight. In the reverse situation where there were basic heading weights but no products priced, a reference PPP from a similar basic heading was used to estimate the PPP for the basic heading with missing prices.

The international consultant on national accounts also visited Cambodia, Lao PDR, and Sri Lanka to advise them either on the compilation of GDP using the expenditure approach or in the estimation of weights at the basic heading level.

Two workshops on the national accounts were convened in February 2005 and May 2006. The first workshop aimed to provide guidance on estimating expenditure weights at the basic heading level and to exchange information and experience, and how to make the national accounts coverage consistent with SNA93. Seventeen economies submitted data at the meeting. At the second workshop, with more complete GDP data submissions, discussions focused on formulating solutions on weight estimation for the basic headings that were difficult to estimate.

Consistency between the GDP data submitted for ICP purposes and those with data in the respective economy websites, UN publications, and especially in ADB's *Key Indicators 2007* (ADB 2007b) was validated. Data in *Key Indicators 2007* were used to update 2004 values to 2005 at the basic heading level. Discrepancies identified were referred to the economies.

The economies were also requested to submit available data for the disaggregation of expenditures by nonprofit institutions serving households (NPISHs). Where this information could not be provided, NPISH total expenditures were proportionally distributed to the relevant household consumption expenditures (except alcoholic beverages, tobacco, and narcotics).

Allocation of Net Expenditure of Residents Abroad

The adjustment item, net expenditure of residents abroad, was not handled consistently in the national accounts of the participating economies. Nine reported zero expenditures for this item, which implied that it had been included in (or distributed across) the relevant components of HFCE. The size of

the adjustment in the other 14 economies was generally small, with the exception of Fiji Islands, which had a very large, negative net expenditure of residents abroad. In order to provide consistency across the region, the Regional Office distributed any nonzero amounts reported across a number of products in household final consumption. The distribution was based on the assumption that the net amount was all tourism related.

The starting point for the allocation was the Tourism Satellite Accounts (TSA) framework. The TSA definitions are complicated by the definition of tourism since it includes domestic and international tourism. Therefore, the focus was on those products that are mainly related to international tourism. Products in the TSA are split into "characteristic goods and services" and "connected goods and services". Those defined as characteristic have a high incidence of tourist purchases while those that are connected have a degree of tourist purchases but somewhat less than for characteristic products.

Ideally, the two gross flows underlying the net expenditure of residents abroad would be distributed on the basis of the TSAs for each economy. However, the allocation had to be rather arbitrary because so few economies have TSAs. To minimize the effect of any misallocations, a broad range of products was included so that no PPP for a single product would have a big impact on the overall result. For example, most food items were included because food is a major expenditure of tourists and it was not possible to narrow the types of food products likely to be purchased by tourists. Characteristic products that were excluded from the allocation were those most likely to be purchased mainly by domestic tourists (motor vehicles, major durables for outdoor and indoor recreation, etc.).

The final category (medical products) contains the types of expenditures that most tourists hope not to incur. Inevitably, though, tourists fall sick or have a dental problem that needs immediate treatment, or are involved in an accident requiring paramedical and/or hospital services. Therefore, on balance, all four medical services were included.

Table 22 shows the products over which net expenditure of residents abroad was distributed, in proportion to the expenditures recorded in their national accounts.

Table 22. Allocation of Net Expenditure of Residents Abroad

Characteristic Goods and Services
Garments
Passenger transport by air
Recreational and sporting services
Cultural services
Accommodation services
Passenger transport by railway
Passenger transport by road
Passenger transport by sea and inland waterway
Combined passenger transport
Insurance
Connected Goods and Services
Rice, cereals, bread, other bakery products
Pasta products
Beef, veal, pork, lamb, mutton, goat, poultry
Fish and seafood (fresh, chilled, frozen, preserved, processed)
Fresh milk, preserved milk and other milk products
Dairy products (cheese, eggs, butter)
Fruit and vegetables (fresh, chilled, preserved, processed)
Sugar, jams, marmalades and honey
Confectionery, chocolate and ice cream
Coffee, tea and cocoa
Mineral waters, soft drinks, fruit and vegetable juice
Beer, wine, spirits
Telephone and telefax services
Games of chance
Medical Products
Medical services
Dental services
Paramedical services
Hospital services

Special Price Collection Guidelines

The Regional Office had to manage a geographically dispersed region, with significantly different types of economies and living standards, and with a wide variety of institutional arrangements, particularly for health and education. As a result, it proved necessary for it to develop special collection guidelines to cover the situations that price collectors were likely to encounter.

The special guidelines were developed over time as problems were encountered. The aim was not only to provide guidance on the most appropriate way of proceeding but also on how best to ensure that comparable prices were collected in all regional economies. In addition, the price validation procedures that the Regional Office intended to follow were sent to all economies. The aim was for them to apply similar, basic editing procedures to their data before they provided the prices to the Regional Office, thereby identifying and resolving some of the problems before formal checking by the Regional Office and before comparisons in data review workshops. The main features of the guidelines and validation procedures are described below.

Health

The health products for which pricing guidelines were set out included: (i) pharmaceutical products (26 items); (ii) other medical products (9 items); (iii) therapeutic appliances and equipment (11 items); (iv) medical services (6 items); (v) dental services (6 items); and (vi) paramedical services (8 items).

The guidelines identified the different ways in which health products can be purchased (i.e., paid for in full by the purchaser, paid for in full by the government and provided free to households, or paid for partly by households and partly by government). They described the type of products to be priced, the outlets that should be included and their distribution across urban/rural areas, the pricing basis required, and the period(s) during which prices could be collected. The brands were also specified broadly (local, regional, and international), as well as a list of international manufacturers.

Some instructions were included to cover different situations that could arise during price collection. For example, a significant degree of variability in the prices collected for a particular product would indicate a need to collect additional prices to obtain a more reliable national average price. In contrast, collecting prices from a single pharmacy chain could lead to little price variability, but the guidelines pointed out that this was undesirable because the prices could be biased. Finally, the guidelines specified some of the traps that price collectors should watch out for (pricing the correct dose/measure, whether the specifications identified a tablet, capsule, or suspension, etc.). Similar guidelines covered other medical products such as therapeutic appliances and equipment, and private medical, dental, and paramedical services. A set of supplementary guidelines was released midway through the collection describing how to deal with some identified problems associated with subsidies, reimbursements, and copayments.

Health (and education) is affected significantly by differing institutional arrangements in different economies. For example, health can be supplied to varying degrees by the private sector or by government, prices can be affected by government subsidies or by private insurance, and the effects of such arrangements can be different for various components, such as hospital services compared with doctors' services. Detailed definitions and examples were provided for each of "subsidies", "reimbursements", and "copayments" so that each could be identified correctly and treated appropriately. Supplementary guidelines also emphasized that the pricing basis should be the full price, before deduction of any subsidies or reimbursements.

Education

As with health, the aim of setting out the guidelines for pricing private education services was to standardize price collection procedures for this difficult component.

Private education expenditures were classified into two broad categories—"regular programs" and "other education programs". The regular programs covered primary, secondary, and tertiary education. Other education programs included foreign language courses, private lessons in mathematics (outside school hours), and music lessons. As was the case with health services, three payment methods were identified (i.e., paid for in full by the purchaser, paid for in full by the

government and provided free to households, or paid for partly by households and partly by government).

The guidelines covered how a range of possible situations should be dealt with. For example, for primary and secondary education, the prices required were the total prices for the specified programs; the prices had to relate to a day student (i.e., not a boarder) who was a national of the economy; and any discounts (e.g., if a private school had discounted rates depending on the financial capacity or the scholastic standing of the student) should not be deducted from the price recorded, so that it would be the full undiscounted cash price for full-paying students. Similarly, any subsidies paid by an employer or the government should not be deducted from the price recorded.

Other points emphasized the importance of collecting the annual fee no matter whether the fees were levied on a term basis, spreading the sample broadly enough across types of schools and urban/rural areas, and having a minimum of 15 observations to derive representative national average prices. Schools had to be a typical size in terms of enrollment level for the economy concerned and, ideally, the class size should be 40–50 students. A checklist was provided of items to be excluded from the price (e.g., payments for meals; uniforms; school supplies such as notebooks or pens; educational field trips; special interest clubs such as science/math, art, or dance; and school bus services).

At the tertiary level, the specifications for university fees were split into two parts—one for a university degree in computer science and one for a degree other than in computer science or natural sciences (physics, biology, botany, or medicine). The price required was the total fees charged for the whole degree (e.g., if it takes 4 years for a degree, then the present total cost for the 4 years from first to fourth year was required, using the current rates for each year of the course). The cash full payment price, rather than an installment price, had to be collected. As was the case with school fees, a list of exclusions from the recorded price (payments for meals, books, field trips, etc.) was provided.

For other education programs, the key issue was to ensure that the sample of teachers or tutors selected was sufficient to derive representative national average prices for these programs. The prices had to be for tuition from teachers or private tutors with at least 5 years of experience in their respective fields of

expertise and the price required was “per lesson or per person”, with a 1-hour lesson being the preferred basis for pricing. Particular types of lessons were specified for pricing. They included language lessons, mathematics tutoring, and music lessons.

Construction

The BOCC approach was a completely new methodology introduced for this round of the ICP, so no region had any previous experience in handling the issues associated with it. The Regional Office set up a core group of construction experts to assist in validating data. The core group met twice. The first meeting examined in detail the prices for each of the region's economies and identified those areas in which some type of follow-up was required.

During the second meeting, the core group defined some key price-determining characteristics for construction products. It focused on those products for which it appeared that different economies had not interpreted BOCC specifications correctly or consistently when pricing the specifications. Actual engineering estimates (rather than quotations) were to be used in pricing the specifications. Examples of the types of points covered were:

- (i) Aggregate base—compaction should be done in four or six layers. Total thickness is 600 millimeters, area = 1,000 square meters. Person-hours should be commensurate with the required compaction.
- (ii) Aluminum frame window—double glazing but single pane.
- (iii) Bridge T-beam—should include form-works.
- (iv) Concrete airfield pavement—subgrade compaction and costs excluded but cost for filling dummy included.
- (v) Underground utility—includes cost of a 100 meter long, 400 millimeter diameter steel pipe. Price should include supporting the trench sides, preparation of bed, filling with native soil or sand, and backfilling.

Procedures Used for Dwelling Rents and Government Compensation of Employees

Some problems were encountered during the compilation of PPPs for dwelling rents and government compensation of employees. The procedures recommended in the ICP Handbook had to be reviewed and new procedures had to be devised to obtain meaningful PPPs and volume measures for these categories. In this section, the new procedures actually adopted for dwelling rents and for compensation of employees are described. Because these procedures were new and had not been adopted in any other region, they were referred to the ICP's Technical Advisory Group (TAG) for approval, which was given at the TAG's meeting in September 2007.

Dwelling Rents

Chapter 10 of the ICP Handbook describes two methods that can be used to obtain PPPs for the basic heading of actual and imputed rentals for housing. The first is based on collecting prices for rents for a number of broadly defined types of dwellings, such as “an apartment, built more than 50 years ago, with one or two rooms and approximately 50 square meters of floor space and without climate control, or a house built less than 25 years ago, with four or five rooms and approximately 115 square meters of living space and with climate control”.

The second method, the quantity approach, requires countries to supply information on both the quantities of dwellings and on their quality to estimate the volume of dwelling services consumed in each economy. The quantity of dwellings in each economy is measured by, in order of preference, usable floor space, number of rooms, or number of dwellings. The quality of the stock of dwellings in each economy is measured by whether they have electricity, inside water, and private toilet. A quality index is constructed by taking the unweighted geometric average of the percentages of dwellings with each of these facilities and the quantity measure, e.g., the total number of rooms in the economy, multiplied by the quality index to obtain a measure of the volume of dwelling services in each economy.

It proved impossible to obtain sufficiently detailed data from regional economies to implement either approach. Therefore, the Regional Office considered a “reference” method as a fall-back solution. Usually, this means using a reference PPP, which is either a PPP that has been calculated for a similar aggregate or a PPP that is “neutral” in the sense that it does not disturb the PPP for the main aggregate to which the problem basic heading belongs. For this basic heading, however, the use of a reference PPP was inappropriate. The national accounts expenditures on actual and imputed rentals for housing reported by the economies appeared to be very unreliable with the result that the volume relatives that would be indirectly obtained by dividing the reference PPPs into the expenditure relatives would contain all the errors in the expenditure estimates. Figure 6 shows the expenditure shares reported by the economies.

Expenditures on rents as a share of GDP generally increase as incomes rise, but Figure 6 shows no such pattern. Two rich economies—Macao, China and Brunei Darussalam—report shares of below 3%; three poor economies—Nepal, Bangladesh, and Cambodia—report shares in excess of 6%; and three middle-income economies—Fiji Islands, Maldives, and Islamic Republic of Iran—report shares of over 10%. Note that this is not a problem unique to Asia. All economies, including many OECD members, have difficulty in estimating rents for housing and, in particular, the imputed rents for owner-occupied dwellings.

The main objective of the ICP is to compare expenditure volumes between economies. Given the impossibility of using a reference PPP, the Regional Office gave priority to this and decided to use a reference volume relative rather than a reference PPP. The volume relative selected was based on each economy’s individual consumption expenditure by households (excluding housing rentals). It is neutral in the sense that it does not change the volume relatives for household consumption expenditure and it is likely that, in general, the relative volumes of housing services consumed will rise in line with the relative volumes of total household consumption expenditure.

Figure 7 shows the per capita real expenditure relatives on rents that were obtained using the reference volume relatives, with Hong Kong, China as the base economy. While this approach is favored over reference PPPs, it definitely has limitations that may require further investigation in future ICP rounds

or in development activities. Hence, the Regional Office decided to accept the estimates with some reservations. Special studies have to be conducted to find answers to interesting observations such as: the low volume relatives for Bhutan, PRC, and Maldives; the large difference between Hong Kong, China and Macao, China; and the fact that Singapore’s volume relative is only 80% of Hong Kong, China’s.

Government Compensation of Employees

Compensation of employees is the largest component of the costs of producing government services. The Global Office defined around 50 occupations that are typically found in government health, education, defense, and general administrative services. These occupations were representative of the various education and skill levels that are commonly found among employees working in these government services and they were used by all regions.

Compensation of employees includes, in addition to wages and salaries, employers’ actual and imputed social security contributions, the value of free or subsidized food and accommodation, and various allowances. For Asia and the Pacific, it was decided that only allowances payable to all staff regardless of their individual circumstances would be included. Therefore, cost of living allowances were included in compensation but not allowances for dependent persons. Economies were asked to report compensation of employees for a person who had been in the relevant post for 5 years. In addition, economies were required to report the number of hours worked per year, and the cost comparisons were based on hourly compensation.

When hourly compensation of government employees was calculated for the 23 participating economies, the intercountry differences were found to be very large. For example, average compensation (based on exchange rates) in the government health sector in Hong Kong, China was about 120 times as high as that in Lao PDR. Economies like Viet Nam, Cambodia, Nepal, and Bangladesh, where government salaries are very low, would therefore have relatively high per capita real consumption of government services compared with economies like Hong Kong, China; Taipei, China; and Singapore where government salaries are much higher. These results did not appear plausible to statisticians familiar with the ways that governments function in the region.

Figure 6. Nominal Shares in GDP of Expenditure on Rents (%)

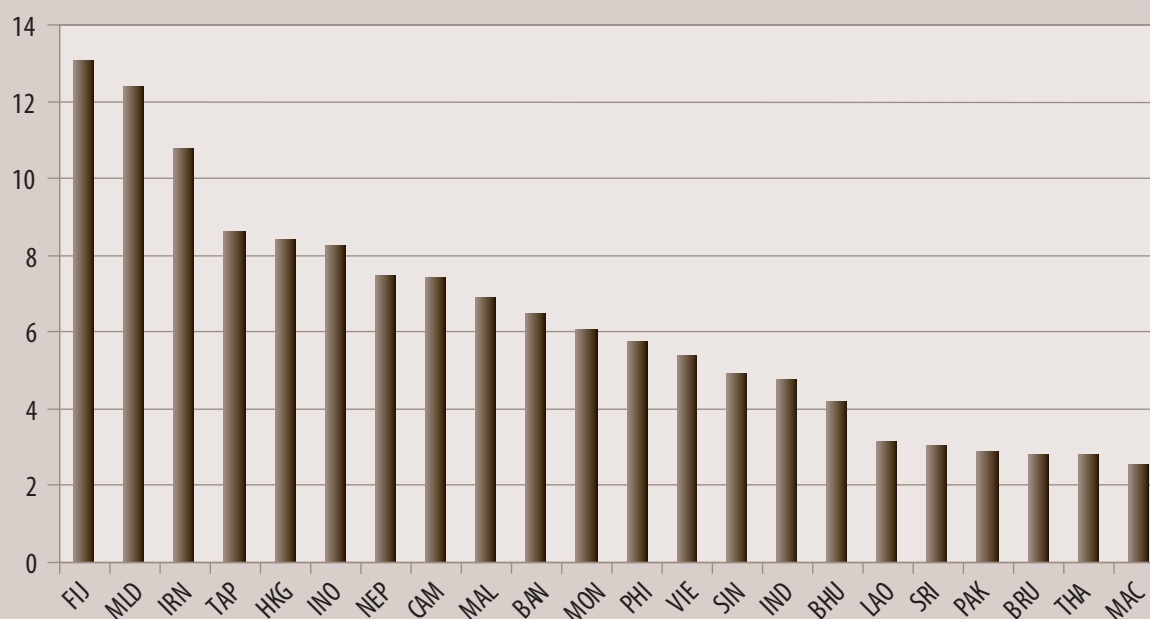
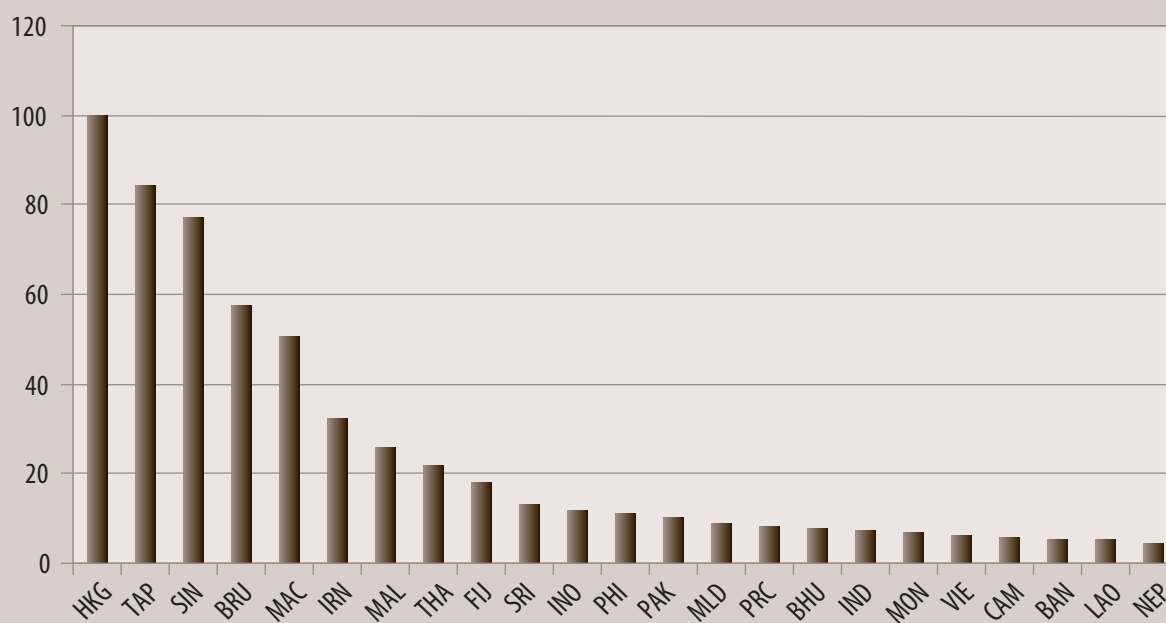


Figure 7. Per Capita Real Relative Expenditure on Rents



The solution adopted by the Regional Office was to adjust government compensation—and hence government consumption expenditure and GDP—by assuming that the productivity of government employees depends on their access to capital equipment. (A detailed description of the procedures used is presented in Appendix 4.)

Finalization of Regional Results

Finalizing the regional results involved several iterations. After the prices had been validated using the Quaranta and the Dikhanov tables, the next step was to compile real expenditures on GDP and its major components. Standardizing these by converting them to a per capita basis was the next step. Per capita real expenditures for each component were compared across all economies in the region and significant variations were checked closely with statisticians from the economies concerned where necessary.

Ring Comparison and the Global Office

Details of the ring comparison methodology are described in the earlier section “Linking Regional Results—The ‘Ring Comparison.’” The Asia and Pacific economies in the ring comparison were Hong Kong, China; Malaysia; Philippines; and Sri Lanka.

The data collection for the ring comparison was for a single quarter only (first quarter of 2006) and several steps were involved in validating the data. After some initial data cleaning, a meeting of the four economies was held at ADB in Manila in June 2006 to check the consistency of price data. The first step was to compare prices, adjusted to Hong Kong dollars using exchange rates. Once the queries raised at this meeting had been resolved and the price data were cleaned, the prices were compared based on PPPs rather than on exchange rates. The next step was to compare the prices for the region with those of the ring economies from the other regions. This process raised a further round of queries, particularly because the price levels from Asia and the Pacific appeared too low. As a result, the Global Office conducted market surveys in both Hong Kong, China and Malaysia to confirm that the prices related to products of consistent quality. The outcome was a confirmation that prices collected met the requirements of the ring comparison.

Reports on Experiences

At the end of the process, the Regional Office requested the 23 participating economies to provide a brief report on their experiences of working on the 2005 ICP. It suggested the following headings: administrative setup; the extent to which the CPI infrastructure was used in ICP data collection; survey framework; GDP expenditure weights (i.e., basic heading data); price data validation; experience of using Tool Pack; extent to which ICP work could be integrated into the overall statistical work program; and overall assessment of the economy’s participation in the ICP.

The reports (presented in Appendix 3) cover a range of issues. In general, economies were very positive about their experiences with the ICP, although some noted problems they faced in collecting prices for the specified products, in estimating the national accounts data at the required level of 155 basic headings, and in installing and using Tool Pack.

Most economies instituted formal administrative arrangements especially for the ICP, although they varied significantly. In some cases, an individual was responsible, generally the head of either the prices or national accounts division; in others, ICP coordination was the responsibility of a small team, commonly consisting of statisticians from these divisions; while some economies established a high-level committee of senior staff from the NSO, sometimes also including representatives from an economics ministry.

The extent to which ICP data collection could be integrated with the CPI varied considerably. Most economies used CPI field staff to collect prices for the ICP. Some, though, stated that very few products priced for the CPI could be used in the ICP, with the result that ICP data collection was an almost completely separate exercise. The main difficulty was that the products priced for the CPI often varied in different localities because of the discretion that CPI field staff had in pricing products within a product group. In particular, the reports noted the differences between pricing the same product over time compared with pricing the same product across all localities within an economy.

The survey framework used also varied significantly around the region. A common theme was that the framework was either based directly on the CPI survey frame, or at least used similar principles. In some cases, the ICP framework was a subset of that for the CPI, particularly with respect to the coverage across the economy. In many cases, ICP data collection was more heavily concentrated in urban areas than the CPI was.

No economy had national accounts data available in sufficient detail to readily provide detailed estimates at the 155 basic heading level. The method commonly used to provide the estimates for HFCE was to draw on data from household expenditure surveys. Many economies reported difficulties in estimating splits for NPISHs, and in providing details for financial intermediation services indirectly measured (FISIM) and for valuables. A variety of sources was used to break down the expenditure on GFCF, with import data mentioned as a data source by several economies.

Price data validation was a critical part of the ICP processing. Initial data validation was the responsibility of each national coordinating agency, which had to check the consistency of its price data before forwarding them to the Regional Office. Typically, prices for the same product were checked for consistency across all localities within the economy and they were also compared with prices for similar products in the CPI. Some agencies verified their data within a formal group, similar to the data review workshops organized by the Regional Office for data validation. The key points checked were that products were comparable, prices were consistent, and that correct units of measurement had been priced.

The comments on Tool Pack varied significantly. Most economies found it useful for storing, checking, and transmitting data. However, a range of problems was identified, including difficulties in installing the program, particularly on networks; difficulties in using some of the features; and problems caused by the units of measurement being either ambiguous or incorrect. Several suggestions were made to improve Tool Pack, including greater user-friendliness, more intensive training, and better documentation.

Most national coordinating agencies responded positively about integrating ICP work into their work programs. They mentioned the following as possibilities that they would investigate: including

ICP products in the CPI, using Tool Pack to process the CPI, and adapting some of the ICP editing procedures for checking the prices collected for the CPI.

Most economies were very positive in their overall assessment of their participation in the ICP, finding that the techniques used in the ICP provided their staff with very useful experience that could be used elsewhere. A benefit mentioned by several was that the meetings to discuss the product lists and to verify the data provided an opportunity for their statisticians to compare experiences and to pick up new ideas.

Lessons Learned and the Future of the ICP

Introduction

An indirect but very important benefit from ICP Asia Pacific is that ADB has been able to use it as a major statistical capacity-building initiative. Within individual economies, ADB has aimed to establish the greatest possible synergies between data collections for the ICP and those for related economic statistics, particularly price statistics. The software and hardware required for collecting and storing the data required for the ICP have been developed in such a way that they can be used for collecting prices for the time-series price indexes, such as the CPI and a range of producer price indexes. The ICP has also been useful in establishing a set of standardized procedures across the region for collecting and editing price and national accounts data.

Harmonizing the ICP and the Consumer Price Index

Ideally, all products priced by each economy for the ICP would be included in its CPI, which would simplify price data collection in future ICP rounds. However, in practice, difficult trade-offs are involved in selecting products that are both representative of expenditures and comparable across at least several economies in the region to use in calculating PPPs. When an economy selects the products to be included in its CPI, representativity is the key criterion and comparability with other economies does not matter. Once a representative product is selected for pricing, the important issue is to price the same product in

subsequent periods so that price changes in the product can be measured over time. The product lists for calculating PPPs within the ICP have been developed so that the competing aims of representativity and comparability are balanced. As a result, products in the ICP product list can be quite different from those in each economy's CPI.

The experience gained in setting up the product lists for the 2005 ICP showed that the diversity of regional economies made it very difficult to identify products that were simultaneously representative and comparable. The Regional Office intends to explore the extent to which ICP products could be included in each economy's CPI but it is important that expectations not be raised too high because this will be a very difficult process to carry out in practice. In addition, the ICP product lists will have to be changed significantly before the next ICP round because of changes in the range and types of products becoming available since the 2005 product lists were established, which will also make it difficult to harmonize the ICP and CPI product lists.

Subregionalization

One of the major difficulties that the Regional Office faced in defining the products for pricing in the 2005 ICP was the diversity of the economies (the richest economy had more than 20 times the per capita real consumption of the poorest) and the products typically consumed in each. The product lists for consumption were set up so that characteristics of some parts of the region (i.e., subregions) were taken into account. The simplest example was including a large number of specifications for rice, which is most commonly consumed in South Asia, as well as a large number of specifications for noodles, which are more common in East Asia.

An alternative approach would be to split the region into two or more subregions. The advantage is that product lists could be more tightly defined for each subregion than for the 2005 ICP (for which subregional differences had to be accommodated within a single list). The disadvantage is that a method of linking would be required to integrate the results for each subregion into the overall results for the region, which is a difficult process. It would be useful to experiment with the 2005 results to determine whether the potential advantages from subregionalizing the region in a future ICP would outweigh the costs involved.

Implementing SNA93 in Asia and Pacific

The national accounts are an integral part of the ICP—they provide the weights used to combine the PPPs and directly influence real expenditure calculated using the PPPs. The basis on which the expenditures in the 2005 ICP were required was SNA93.

The Regional Office was very conscious of the importance of the national accounts and ran two workshops to ensure that economies were reporting their national accounts as consistently as possible. It did not adjust economies' national accounts to remove any inconsistencies that arose from those relatively few economies not yet compiling their national accounts on the basis of SNA93. (The previous version of this standard was released in 1968 and some economies still adhere to this old version.) The differences in GDP are unlikely to be huge but, generally, GDP tends to be about 2% higher on the basis of the later version. Metadata are available on the website of the International Monetary Fund under the General Data Dissemination Standards.²⁰ These metadata identify economies with national accounts differing from the 1993 standard, and in what areas they deviate. The economies still compiling their national accounts on the basis of the 1968 standard are being encouraged to move to the 1993 framework as soon as possible.

Most economies had some difficulty in reporting the national accounts data at the required level of 155 basic headings. This level of detail is important for the purposes of the ICP. ADB will encourage economies to take account of this requirement when they upgrade their national accounts or when they improve the economic surveys on which their accounts are based.

Extrapolating from the 2005 ICP Benchmark

It is clear that the ICP will be conducted infrequently in the future because of the lead time required, the high monetary costs involved, and the staff resources required by the NSOs. As a result, it is highly desirable to develop some means of extrapolation. Ideally, PPPs would be extrapolated from 2005 using detailed price data at the level of

²⁰ Available: <http://dsbb.imf.org/Applications/web/getpage/?pagename=gddshome>.

the 155 basic headings. However, as economies do not have consistent time-series price indexes at this very detailed level, it is most likely that the extrapolation will be carried out for GDP only or, perhaps, for a handful of major components of GDP.

The procedure consistent with that used in other extrapolations would be to calculate the ratio each year of the GDP deflator between Hong Kong, China and each economy in Asia and the Pacific (assuming Hong Kong, China is used as the base economy) and extrapolate the PPP for 2005 to other years by the change in this ratio from 2005. This method will provide useful indicators of what the benchmark PPPs would be had they been calculated for each year from 2005. However, the PPPs estimated using this process will differ from those obtained from a full benchmark ICP. There are several reasons for this.

First, the weighting patterns for the deflators in the national accounts are different from those underlying the PPP benchmarks. Second, the composition of the price series differs because the key requirement in producing PPPs is for the products priced to be representative and comparable between economies, while in time series the main requirement is for each product to be priced to consistent quality over time. Third, an assumption underlying the extrapolation process is that the structures of the economies involved change at the same rate, which is not going to happen in practice. Fourth, the prices underlying the national accounts deflators are adjusted to remove changes in quality over time, but the procedures for doing so differ between economies. Yet, despite these limitations, some useful results can be obtained by extrapolation.

Purchasing Power Parities and Poverty Analysis

The World Bank has established an “absolute poverty line,” which is the equivalent in local currency to US\$1.08 per day (often referred to in a rounded form as US\$1 a day). Converting this into local currency will produce significantly different outcomes depending on whether the conversion is via exchange rates or PPPs. The World Bank uses PPPs to measure the purchasing power in local currency of this amount because exchange rates significantly understate the purchasing power of the currency of lower-income economies in their own markets.

The expenditure patterns of the poor differ significantly from the overall national average in most lower-income economies. Therefore, for this ICP round, the Global Office’s Poverty Advisory Group identified the basic headings covering those goods and services that are most important to the poor (e.g., food, clothing and footwear, housing, and health). PPPs can be computed for a country using expenditure weights for those living in poverty based on the prices in relevant basic headings together with weights relevant to their expenditure patterns (generated from household income and expenditure surveys). The Global Office’s aim is to adopt a more sophisticated approach in future ICP rounds based on an analysis of data from the current round.

The size of the gaps in living standards between comparatively rich and poor economies is not the only major policy concern. Equally important is determining whether the gaps are narrowing or widening over time, and at what rate. National accounts provide the basic data required for these types of analysis but, as noted above, PPPs need to be calculated at regular intervals to allow their conversion into a common currency for analytical purposes.

Language

A problem that affected the Asia and Pacific (probably more than any other region) was language. Everything produced and circulated by the Global Office was in English. The Tool Pack menu system was initially only in English, although it was later translated into a handful of other languages. The Asia and Pacific economies were using 18 different languages between them. Although correspondence in English was a generally acceptable approach, it was very difficult for the NSOs to work with product specifications and collection instructions unless they were translated into the local language. This need for translation activities was not anticipated. Thus, this was not included in the project’s timetable.

It is important that the timetable for the next round explicitly allows the time required to translate the product specifications and collection instructions into local languages, and for the translations to be checked. Also, the Tool Pack menu system should be translated into all local languages in the region because of its important role in storing, editing, and transmitting data.

Ensuring Data Quality—Investment in Construction and Equipment

An innovation introduced in the 2005 ICP Asia Pacific was to establish “core groups” of experts to assist in pricing products in construction and in equipment. For construction, this involved a completely new approach (the basket of construction components method—see the section “Construction,” a few pages earlier, for details). While this method broadly catered to the different techniques used in the construction industry in the region, pricing the various components and inputs was still a task for experts in the field rather than the staff in a NSO. Similarly, the types of equipment specified in the product lists were often difficult for people other than experts in that field to identify correctly. As a result, each economy engaged the services of experts in these fields to price the products specified by the Global Office.

Establishing the core groups for construction and equipment was a very useful initiative. The changes to the prices initially reported that resulted from their discussions were often significant. The PPPs ultimately produced for investment were far more coherent than they would have been if these groups had not closely examined the specifications and provided their advice on the accuracy of the prices initially reported.

Conclusion

The real expenditures presented in this publication are a huge step forward in providing economic analysts with the data needed to study the economic relationships between economies in Asia and the Pacific. The Regional Office is confident that the estimates of PPPs and associated data in this ICP round are far more robust than those compiled in earlier rounds because of the improved procedures in methodology, as well as in data collection, review, and processing. There are also some important side benefits. Data consistency is a critical element of the ICP and the data-vetting procedures developed for the ICP by the Global Office and the Regional Office have proven to be a very useful means for economies to validate their national accounts and price data. Also, the data review workshops provided the region’s economic statisticians with an all-too-rare opportunity to meet and compare their collection methods and compilation procedures. These workshops also helped in creating a sense of ownership among the participating economies of the procedures and methods employed and of the final results compiled.

Improvements in the quality of the region’s economic statistics will enable ADB to better monitor and compare the economic situations in its member-economies. In addition, participating in a broad-reaching statistical exercise like the ICP has given the region’s economic statisticians an ideal opportunity to expand their skills through involvement in innovative statistical work. As well as learning more about their own fields of statistics, they have been able to learn about related fields and the interrelations between them. ADB considers that this statistical capacity building has turned out to be a very important by-product of the 2005 ICP.