ADB

2009 Purchasing Power Parity Update

for Selected Economies in Asia and the Pacific

A Research Study

Asian Development Bank

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September 2012

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Printed in the Philippines.

ISBN 978-92-9092-860-7 (Print), 978-92-9092-861-4 (PDF)
Publication Stock No. RPT125027

Cataloging-In-Publication Data

Asian Development Bank.
2009 purchasing power parity update for selected economies in Asia and the Pacific: A research study.
Mandaluyong City, Philippines: Asian Development Bank, 2012.

1. Purchasing power parity. 2. Asia and the Pacific. I. Asian Development Bank.

Note:
In this book, the term "member economy" refers to a member of ADB.

Data published in this report are the outputs of regional technical assistance 6482: Improving Price Collection of Non-Household Expenditure Components and Updating Purchasing Power Parity Estimates for Selected Developing Member Countries, ADB.

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Foreword

Purchasing power parities (PPPs) and PPP-based gross domestic product (GDP) data have been used increasingly over the past years for economic and statistical analysis. Traditionally, PPPs have been extrapolated using national accounts deflators between the availability of benchmark PPPs. Over long periods of time, however, this methodology yields estimates inconsistent with benchmark figures. The Asian Development Bank (ADB) undertook regional technical assistance (RETA) 6482: Improving Price Collection of Non-Household Expenditure Components and Updating PPP Estimates for Selected Developing Member Countries (2009 PPP Update) to develop an updating methodology that would address long-standing issues associated with the extrapolation of PPPs over long periods of time. This research initiative for 2009 makes available consistent and internationally comparable PPPs and PPP-based GDP components between the 2005 and 2011 benchmarks. The same undertaking would also be a vehicle for preparing participating economies for the 2011 International Comparison Program (ICP). The continuous implementation of activities within the ICP framework will be useful in formulating policies that will support inclusive growth in Asia and the Pacific region.

To sustain capacity and interest in ICP in Asia and the Pacific region, national statistics offices (NSOs) must continuously collect data outside of their mandated work programs. The RETA sought to address this by aiming to align data needs for PPP computation with the regular price collection and national accounts estimation activities of NSOs. This integration would not only lower costs but also enable more sustained data support for PPP compilation. As another advocacy platform for the use of PPPs, the updating initiative also demonstrated the applications of PPP concepts and methodologies at the national level in large, geographically diverse economies.

Twenty-one ADB member economies participated in the technical assistance program: Bangladesh; Bhutan; Brunei Darussalam; Cambodia; the People's Republic of China; Fiji; Hong Kong, China; India; Indonesia; the Lao People's Democratic Republic; Malaysia; the Maldives; Mongolia; Nepal; Pakistan; the Philippines; Singapore; Sri Lanka; Taipei,China; Thailand; and, Viet Nam.

This publication presents the methodology leading to, and resulting in PPPs for 2009 of participating economies, updated from 2005. Included are estimates of PPP-adjusted GDP and its major components, namely, household final consumption expenditure, actual final consumption of households, government collective final consumption expenditure, gross capital formation, and net external trade.

The 2009 PPP Update marks another milestone in statistics for Asia and the Pacific region for four main reasons. First, ADB was able to test a cost-effective alternative approach to PPP estimation during non benchmark years with the core list approach. Second, price collection was limited to capital cities and, in the need to adjust capital city to national average prices, data mining from the consumer price index established the possibility of computing subnational or intra-country PPPs for household final consumption expenditure. Third, the updating exercise has enabled an improved understanding of PPP concepts and methodology and once more built statistical capacity among participating ADB member economies on both price and national accounts. Finally, the data validation procedures in the 2009 PPP updating are now being adopted in selected economies for the consumer price indexes, thus improving the quality of national price statistics.

Sincere appreciation goes to all those who have contributed to the success of this PPP updating exercise—the World Bank for providing technical assistance, and the international and national consultants who assisted ADB in many ways. I also wish to thank the dedicated staff of the Economics and Research Department and, most importantly, the national implementing agencies and government agencies in each of the 21 participating economies for their in-kind and financial contributions, cooperation, and hard work.

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Acknowledgments

The 2009 purchasing power parity (PPP) Update was carried out with funding from the Asian Development Bank through regional technical assistance (RETA) 6482: Improving Price Collection of Non-Household Expenditure Components and Updating PPP Estimates in Selected Developing Member Countries (2009 PPP Update). The governments and national statistics offices of 21 Asian Development Bank (ADB) member economies fully cooperated with ADB in the RETA's successful implementation.

The computation of the 2009 PPP received substantial technical guidance from the World Bank through Yuri Dikhanov. Special thanks are due to the heads, national coordinators, and the International Comparison Program (ICP) team members in all national implementing agencies for their active participation, hard work, and collection of high quality price data and the provision of gross domestic expenditure weights. The national implementing agencies were the Bangladesh Bureau of Statistics; National Statistical Bureau, Bhutan; Department of Economic Planning and Development, Brunei Darussalam; National Institute of Statistics, Cambodia; National Bureau of Statistics of China; Fiji Bureau of Statistics; Census and Statistics Department, Hong Kong, China; Central Statistics Office, India; Badan Pusat Statistik, Indonesia; Lao Statistics Bureau, Lao People's Democratic Republic; Department of Statistics, Malaysia; Department of National Planning, Maldives; National Statistical Office, Mongolia; Central Bureau of Statistics, Nepal; Pakistan Bureau of Statistics; National Statistics Office, Philippines; Department of Statistics, Singapore; Department of Census and Statistics, Sri Lanka; Directorate-General of Budget, Accounting and Statistics, Taipei,China; Bureau of Trade and Economic Indices, Thailand; and General Statistics Office, Viet Nam.

Special thanks are also due to the national coordinators and national price experts, namely: Abu Syed Asad, Dipankar Roy, and Satya Ranjan Mondal, Bangladesh; Jigme Nidup and Tshering Dorji, Bhutan; Hj. Alias bin Hj Mohammad and Siti Kamariyah Mohammad, Brunei Darussalam; Khin Song and Sim Ly, Cambodia; Shi Ting and Wang Lei, People's Republic of China; Nilima Lal and Peni Waqawai, Fiji; Leslie Wai-Kong Tang and Ka-lin Chan, Hong Kong, China; Ramesh Kolli, G. M. Boopathy, and Sanjay Kumartiyagi, India; Sasmito Hadi Wibowo and Yunita Rusanti, Indonesia; Kor Yang Pamah and Phousavanh Chanthasombath, Lao People's Democratic Republic; Kamarudin bin Muhammad and Sa'adiah binti Ahmad, Malaysia; Mariyam Niyaf and Aishath Laila, Maldives; Badamtsetseg Batgarjal and Sarangerel Banzar, Mongolia; Bikash Bista and Ganesh Acharya, Nepal; Arif Mahmood Cheema and Ismail Khan, Pakistan; Rosie Sta. Ana and Elena Varona, Philippines; Koh Phuay Leng and Chau Wun, Singapore; D. C. A. Gunawardena and A. G. S. Kariyawasan, Sri Lanka; Chou Ying Tsuei and Jiapeng Huang, Taipei,China; Prayoth Benyasut, Apichaya Sopon, and Siriwan Tongsakul, Thailand; and Nguyen Duc Thang and Le Hai Ha, Viet Nam.

A focus group provided valuable advice in finalizing the 2009 PPP Update including its analysis, and interpretation vis-à-vis the 2005 PPP benchmark estimates. The group was composed of Prayoth Benyasut, Derek Blades, G. M. Boopathy, S. K. Das, Yuri Dikhanov, Carmelita Ericta, Rusman Heriawan, Wen Jianwu, Uttam Malla, Paul McCarthy, Bishnu Dev Pant, Prasada Rao, Rosie Sta. Ana, Leslie Wai-Kong Tang, Shi Ting, and Sasmito Hadi Wibowo.

This project was conducted by the Development Indicators and Policy Research Division of the Economics and Research Department of ADB, under the overall coordination and supervision of Chellam Palanyandy, lead statistician, with the technical assistance of Eileen P. Capilit, associate economics and statistics officer. Virginia N. Gañac served as national consultant, Clarita D. Truong provided administrative assistance and Rhommell S. Rico provided IT support. Paul McCarthy prepared the initial version of the report, and Ma. Theresa Mercado edited the manuscript. Design and typesetting were performed by Joe Mark Ganaban. This report was published with the support of the ADB Printing Unit.

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Abbreviations

ADB	–	Asian Development Bank
AFC	–	actual final consumption
BAN	–	Bangladesh
BHU	–	Bhutan
BRU	–	Brunei Darussalam
CAM	–	Cambodia
COICOP	–	Classification of Individual Consumption by Purpose
CPD	–	country-product-dummy
CPI	–	consumer price index
CPRD	–	country-product-representativity-dummy
CV	–	coefficient of variation
DMC	–	developing member country
EKS	–	Eltetö-Köves-Szulc
FIJ	–	Fiji
FISIM	–	financial intermediation services indirectly measured
GDP	–	gross domestic product
GFCE	–	government final consumption expenditure
GFCF	–	gross fixed capital formation
GK	–	Geary-Khamis
HDI	–	Human Development Index
HFCE	–	household final consumption expenditure
HKG	–	Hong Kong, China
HK$	–	Hong Kong dollar
ICP	–	International Comparison Program
IDB	–	Iklé-Dikhanov-Balk
IND	–	India
INO	–	Indonesia
IPL	–	international poverty line
Lao PDR	–	Lao People’s Democratic Republic
LCU	–	local currency unit
M&E	–	machinery and equipment
MAL	–	Malaysia
MLD	–	Maldives
MON	–	Mongolia

n. e. c.	–	not elsewhere classified
NEP	–	Nepal
NSO	–	national statistics office
OECD	–	Organisation for Economic Co-operation and Development
PAG	–	Poverty Advisory Group
PAK	–	Pakistan
PCT	–	price collection tool
PHI	–	Philippines
PLI	–	price level index
PPP	–	purchasing power parity
PRC	–	People's Republic of China
PWT	–	Penn World Tables
RETA	–	regional technical assistance
SIN	–	Singapore
SNA	–	system of national accounts
SRI	–	Sri Lanka
TA	–	technical assistance
TAP	–	Taipei,China
THA	–	Thailand
VIE	–	Viet Nam
WDI	–	World Development Indicators

Executive Summary

Introduction

The International Comparison Program (ICP) was conceptualized in the 1960s to generate purchasing power parities (PPPs). These are currency converters that eliminate price level differences between economies and allow volume comparisons of economic aggregates such as gross domestic product (GDP) expenditures and its components. Thus, PPPs are used for spatial comparisons (of economic aggregates), similar to the way the consumer price index (CPI) is used for temporal comparisons. This study on updating the 2005 PPPs to 2009 for a group of Asian economies presents the updating methodology and the 2009 PPP results. An important aspect of the study has been building the technical capacity of the participating national statisticals offices.

The ICP Global Office, located at the World Bank coordinates the overall ICP program, with various international agencies managing the regional programs. The Asian Development Bank (ADB) was the regional coordinating agency for the 2005 ICP in Asia and the Pacific region (2005 ICP Asia Pacific). Seven benchmark rounds have taken place between 1970 and 2010. The seventh ICP round was for reference year 2005. For years in between ICP rounds, annual PPPs are extrapolated from benchmark PPPs.

The conventional way to extrapolate benchmark PPPs is first to calculate the rate of price inflation of a country relative to the rate of price inflation in the reference or numeraire currency. The resulting ratio is then applied to the benchmark PPPs of the country. Price inflation here refers to the country's GDP deflators. However, such extrapolated PPPs may be inaccurate because the process assumes that countries have similar economic structures as in the benchmark year and that their structures change at the same rate over time.

The 2009 Purchasing Power Parity Update

ADB implemented a research initiative to explore an alternative methodology for extrapolating PPPs, under regional technical assistance 6482. The 2009 PPP Update (Update) provides an intermediate benchmark and more firmly based real expenditures and price level indexes for 2009 than would have been possible using the extrapolation technique. The aim was to have a cost-effective way of updating the 2005 PPPs to 2009. The Update uses fewer price collections—in terms of number of products, geographic coverage, and frequency of price collection—than in a benchmark PPP and draws on the relationship of the 2005 ICP price data and the 2005 PPP for necessary adjustments.

Twenty-one of the economies that participated in the 2005 ICP Asia Pacific were part of the Update. These were: Bangladesh; Bhutan; Brunei Darussalam; Cambodia; People's Republic of China (PRC); Fiji; Hong Kong, China; India; Indonesia; Lao People's Democratic Republic (Lao PDR); Malaysia; Mongolia; the Maldives; Nepal; Pakistan; the Philippines; Singapore; Sri Lanka; Taipei,China; Thailand; and Viet Nam.

Purchasing Power Parity Compilation

PPPs are calculated by comparing the prices of a specified basket of goods and services between countries. The simplest situation is when only two countries are being compared (a bilateral comparison); the resultant PPPs can be expressed in terms of the currency of either country. In such a case, the PPP for a particular product is the rate of exchange at which the currency of the first country would have to be converted into the currency of the second to purchase the same quantity and quality of the product in both countries. The most celebrated bilateral PPP is the Big Mac Index.

The Update and the 2005 ICP are "multilateral comparisons," covering a wide range of products with multi-country participation. A multilateral comparison is a much more complicated exercise both in terms of underlying concepts and computations.

In multilateral comparisons, three major components are required to compute PPPs. The first component is price data. It is necessary to identify and price a basket of goods and services of similar quality that are comparable across countries and broadly representative of the goods and services included in the GDP of each participating country. These cover household consumption products and services; machinery and equipments products; construction related products and services; and government services. In the 2005 ICP, a total of 833 products and services were identified for pricing in the region. Prices were collected at monthly/quarterly intervals to account for seasonal price variations and, nationwide to account for geographic representation. This is one of the reasons why conducting benchmark ICP is expensive and is carried out infrequently.

The second component is expenditure weights from the annual GDP expenditure estimates (household final consumption expenditure; government final consumption expenditure; gross capital formation; and balance of exports and imports) to be broken down into 155 expenditure categories, termed basic headings. The basic headings represent the categories into which individual goods and services are grouped for pricing purposes; it is the lowest level for which expenditure estimates are required.

The third component is the aggregation process to obtain PPPs. Three broad stages are involved in the aggregation process. These are (i) averaging the individual price observations to form national annual average prices for each product in each economy, (ii) calculating unweighted PPPs at the basic heading level, and (iii) calculating weighted PPPs for GDP and its major aggregates. Many methods can be used in each of these stages.

The 2005 ICP used the following methods. For the first stage of aggregation, the national annual average price per product was obtained as the arithmetic mean of the prices observed during the year. As there are no expenditure weights available at the product level, the next step was to calculate the unweighted PPPs at the basic heading level. The country-product-dummy model was used in which unweighted PPPs for each basic heading are estimated simultaneously for all the economies. In the final step, the unweighted basic heading PPPs of each economy were aggregated to broader level PPPs for GDP and its major aggregate, using the Eltetö-Köves-Szulc method. The basic heading expenditures are used as weights in this aggregation process.

The 2009 Update Methodology

The Update adopted similar procedures and methods as listed above. However, as the Update was a relatively small-scale and less resource intensive exercise, a core list of only about one-third of the 2005 ICP household final consumption, and machinery and equipment products were selected for pricing in 2009. To identify the products for inclusion in the core product lists, the "combinatorial" approach was used. In this approach, all possible combinations for each basic heading are computed and a random selection of items within each basic heading is generated. For instance, in the rice basic heading, 19 varieties of rice were included in the 2005 ICP. This list was downsized to about 30% for the Update. The combinatorial method generated 27,132 combinations and singled out the combination of 6 varieties (30%) of rice, which delivered minimum deviations from the full list for the rice basic heading for the whole group of economies (standard deviation was 8.1%). The same combinatorial approach and 30% criterion were carried out in most of the basic headings. In instances where the number of products within each basic heading was three or less, all the products were included. The final household products list for the Update numbered 269 out of 656 products (in 2005) and for machinery and equipment, 61 out of 91 products. In the case of construction, a slightly modified version of the combinatorial process was used and 10 out of 34 products were selected, while for government services, compensation of employees of all the 50 types of employees was covered. A total of 402 products and services were priced in the Update.

Price collection of household items was conducted only in the capital cities and the frequency of price collection was limited to once each quarter of 2009. For machinery and equipment products, a one-time price collection limited to capital cities (as in 2005) was implemented.

The core lists, however, covered all basic headings and all components of GDP expenditures and for consistency with the 2005 ICP, the PPPs for some household basic headings, as well as for inventories acquisition of valuables, exports, and imports of goods and services, were based on reference PPPs.

The following adjustments were implemented to obtain meaningful comparison with the 2005 results, given the Update downscaling:

(i) The 2009 capital city prices at product level from the core list were adjusted to national level using the relationship of the capital city and national level prices from the 2005 ICP.

(ii) The 2009 PPPs computed for each basic heading from the core list were "adjusted" to obtain the PPPs for the implied "full" list (for 2009), using adjustments factors. The adjustment factors for each basic heading were the coefficients (deviations) between the PPPs from the core list and the full list calculated from the 2005 ICP.

Highlights of Results

Real GDP and per capita real GDP

- Real GDP is found to be consistently larger than nominal GDP (except in the case of Fiji), because of the combinations of the PPPs being expressed in Hong Kong dollars and the deviations between the PPPs and the exchange rates of the regional economies. Real GDP is larger than nominal GDP by 62% (HK$43,952 trillion) for Asia. (Note: For consistency and comparability with the 2005 PPP benchmarks, Asia refers to the 21 participating economies in the Update, and the Islamic Republic of Iran and Macao, China. The latter two economies participated in the 2005 ICP and were included in the Update for computation purposes only.)

- PRC and India together account for over two-thirds of the regional output of Asia, taking first and second positions, respectively. However, their positions change to 8th and 17th, respectively, when per capita real GDP is considered. The per capita real GDP for the PRC is HK$40,706 while that for India is HKS19,500. The Asia (regional) average is HK$32,704.

- GDP shares of the PRC and India differ in relation to their shares of population. PRC's share of GDP, at 47.5%, is substantially higher than its population share at 38.2%. While India's population share is 33.3%, its share of GDP is only 19.9%. This indicates that per capita real GDP is significantly higher in the PRC than in India.

- The shares of nominal GDP in total regional GDP of high income economies (Brunei Darussalam; Hong Kong, China; Singapore; and Taipei,China) is higher than their real GDP shares, reflecting their higher price levels.

- There is wide disparity in per capita real GDP among the economies in the region. The per capita real GDP in the richest economy, Singapore, is over 35 times higher than that of the poorest economy, Nepal. However, the disparity is much less in terms of per capita real actual final consumption (AFC), a better measure of well-being. Hong Kong, China, which has the highest per capita real AFC, is only 19 times as great as the lowest economy, Nepal.

Real actual final consumption

- Within expenditure groups, nondurables have the narrowest spread of expenditures among the economies, and durables have the widest. This is mainly because food constitutes a large proportion of nondurables across all economies while durables are consumed in much larger quantities in higher income economies. The per capita real expenditure index ranges from 336 to 68 for nondurables; 1,095 to 27 for semi-durables; 2,030 to 13 for durables; and 1,136 to 24 for services. The Asia average is 100.

- The per capita real expenditure for different components of food reflects differences in tastes and preferences, as well as agro-climatic conditions, among the economies in the region. For instance, Nepal's per capita real expenditure index for AFC is 42 (58% lower than the Asia average) while the index for bread and cereals is

214 (114% higher than the Asia average). In the Philippines, the per capita real expenditure index for AFC is 111 while the index for meat and fish is 250. Mongolia has a per capita real expenditure index for meat and fish at 252 compared to an index of 30 for fruits and vegetables.

- Per capita real expenditures on education are highest among the richest economies. On average, the high income economies of Hong Kong, China; Taipei,China; Singapore; and Brunei Darussalam spend about 20 times more on education than Nepal which has less than one-third the Asia average.

- Per capita real expenditures on health is highest in Taipei,China at more than nine times the Asia average, followed by Hong Kong, China and Singapore at about 6 times the Asia average. At the other end, Philippines, Bangladesh, Indonesia, and Lao PDR, have under one-third the Asia average for health.

- Transport and communication expenditures across the region vary widely between the richest and the poorest economies. The high income economies have per capita real expenditures more than five times the Asia average while Bangladesh and Bhutan have per capita expenditures at below 80%, and Nepal at below 90% the Asia average.

- The pattern of per capita real expenditures on recreation and culture, and restaurants and hotels are broadly consistent with the size of per capita real AFC. Slightly more than half the economies spend less on recreation and culture and two-thirds of the economies spend less on restaurants and hotels than the Asia average. Extreme cases include an index of 8 in Bangladesh on recreation and culture (92% below the Asia average) and an index of just 2 in Bhutan on restaurants and hotels (98% below the Asia average).

Gross fixed capital formation

- Construction is the dominating component of gross fixed capital formation (GFCF). Only three economies—Hong Kong, China; Malaysia; and Pakistan—have lower real per capita expenditure on construction than on machinery and equipment.

- Other than the three highest income economies of Singapore; Hong Kong, China; and Brunei Darussalam, the PRC and Bhutan have higher per capita expenditure on construction than any other economy in the region.

- The high per capita expenditure on construction in the PRC translates to more than 60% of the construction activity in the region, given that the PRC has almost 40% of the population of the participating economies.

Price level indexes

- A price level index (PLI) is the ratio between a PPP and the exchange rate of a given currency with respect to a reference currency, and shows how the price levels of economies compare with each other. High income economies, where wages, and hence, the prices of services tend to be high, have relatively high PLIs. Hong Kong, China and Singapore are among the expensive economies, both of which have price levels for GDP 50% higher than the Asia average (100). Fiji's PLI for GDP is even higher, at 60%, mainly because a large share of the products consumed in Fiji is imported. The cheaper economies where PLIs for GDP are 30% lower than the Asia average are Lao PDR, Cambodia, Viet Nam, India, Bhutan, and Pakistan.

- The PLIs for AFC and household final consumption expenditure are fairly consistent with those for GDP, reflecting the high share of these components in the GDP.

- The machinery and equipment component of GFCF has a narrow spread in the PLIs as a large proportion of machinery and equipment is imported by most of the economies. Thus, the price levels in each economy are set to a large extent by prices in the world market.

Governance, Organization, and Implementation of the 2009 Update

The Update was a research initiative of ADB, confined to the participating member economies. A framework of partnership specified the responsibilities of ADB and the national implementing agencies. The bottomup approach used in the 2005 ICP was maintained, as well as the emphasis on a sense of ownership among all parties. The proposals to (i) reduce the number of products to be priced, (ii) adjust price levels obtained from the reduced (core) product list to those consistent with the full list, and (iii) adjust capital city prices to national annual average prices for 2009 were all agreed upon during an inception workshop in Bangkok in January 2009.

Data within and across economies were validated through the same procedures as in 2005. The Quaranta and Dikhanov tables were the main validation tools used. Data entry and economy level validation relied on the six-module Price Collection Tool developed by ADB on MS Excel. In addition, product prices, basic heading values, and price trends in the national CPIs at the lowest possible level, were checked and compared between 2005 and 2009.The final results of the Update were presented to the heads and price statisticians of the national implementing agencies before the regional report was prepared.

Lessons Learned and Future Directions

Statistical capacity building has been an important benefit from the Update. ADB will continuously strengthen the synergies between the statistical data collected by the regional economies and the ICP data requirements, particularly national accounts and prices.

Harmonizing the ICP requirements for price data within the CPI has been strongly encouraged since the completion of the 2005 ICP. The Update has provided extra impetus to this initiative, with the 2011 ICP also driving home the benefits of being able to extract ICP prices from the CPI. The need to adjust capital city prices to national averages led to exploratory work on using the CPI data of the Philippines to calculate adjustment factors. The result is that it may be possible to use national CPI data to adjust capital city prices to national averages. The benefits of such an approach for the ICP would be largely reduced data collection costs. The exploratory work also successfully examined using CPI data to compute subnational PPPs.

The price collection tools developed for the Update not only facilitated data validation and data management for ADB. Selected economies also use these tools for their CPI activities. ICP data collection software has improved since the 2005 ICP round, and has proven to be an important initiative in the 2011 ICP price collection. The Update was also useful in providing a firm step-off point for the 2011 ICP.

Conclusion

The Update has enhanced the skills of economic statisticians in the participating economies as well as staff in ADB. In addition to statistical capacity building, the 2009 PPP Update continues the process of providing a sound basis for meaningful comparisons of major macroeconomic aggregates for economies from Asia and the Pacific region.

Introduction 1

The Role of Purchasing Power Parity

Economic information is crucial in formulating policies and programs to improve human lives—the ultimate goal of economic development. However, the different social and institutional arrangements in different countries create difficulties in comparing levels of economic development. Comparisons of economic aggregates such as gross domestic product (GDP) are further complicated when economic variables are expressed in different currencies.

The challenge, therefore, is to convert economic aggregates such as the GDP into standard currency units that are comparable across countries. The most common method of converting economic data from a national to a common currency is to use exchange rates such as the US dollar. However, comparisons based on exchange rate—converted GDPs frequently yield results inconsistent with actual economic growth and level of development in terms of GDP in the countries being compared.

Awareness in the international community of the problems associated with exchange rate conversions gave rise in the 1960s to the International Comparison Program (ICP), which was intended to generate purchasing power parity (PPP) data. In their simplest form, PPPs are price relatives, which show the ratio of the prices in national currencies of the same good or service in different countries. PPPs, however, are calculated not only for individual products but also for product groups and for each of the various levels of aggregation up to and including GDP. Hence, the main purpose of PPPs is to obtain rates of currency conversion that eliminate the differences in price levels between countries and thus, permit volume comparisons.

The International Comparison Program

The first round of the ICP was conducted in 1970. It covered 10 countries and collected price data for a small range of goods and services. Since then six rounds of the ICP have been conducted—in 1973, 1975, 1980, 1985, 1993, and 2005—with each round becoming bigger and better, with more countries participating, a wider range of goods and services priced, and continuous improvements made in the methodology. The 2005 round of the ICP has been considered the most extensive and carefully monitored comparison, covering 146 countries from six regions: Africa, Asia and the Pacific, Latin America, Western Asia, Commonwealth of Independent States, and the Organisation for Economic Co-operation and Development (OECD)/Eurostat.

The 2005 International Comparison Program for Asia and the Pacific Region

In 2001, at the invitation of the World Bank, which served as global coordinator of the ICP, the Asian Development Bank (ADB) took the lead role in the coordination and management of the 2005 round of the ICP in Asia and the Pacific region. ADB implemented the regional technical assistance (RETA) Strengthening and Collection of Purchasing Power Parity Data in Selected Developing Member Countries[1] to carry out the 2005 ICP for Asia and the Pacific from 2003 to 2007. The outcome was the 2005 PPPs for Asia and the Pacific and comparable PPP-converted expenditures for major national accounts

1 ADB. 2003. *Technical Assistance for Strengthening and Collection of Purchasing Power Parity Data in Selected Developing Member Countries*. Manila.

aggregates, including GDP for 23 regional economies[2] expressed in a common currency (Hong Kong dollars [HK$]) and at constant price levels. Importantly, the estimates of final consumption expenditure included expenditure categories, such as those on food, that were relevant to policy making, and enabled details to be derived for expenditures on staple products.

The results of the 2005 ICP in Asia and the Pacific region were released in a detailed publication, *2005 International Comparison Program in Asia and the Pacific: Purchasing Power Parities and Real Expenditures*.[3] The World Bank released the global results in *Global Purchasing Power Parities and Real Expenditures: 2005 International Comparison Program*.[4]

The success of the 2005 ICP in Asia and the Pacific region was a major achievement, not only for ADB but also for the national statistics offices (NSOs) and other national agencies of participating economies. The 2005 ICP was a statistical milestone in scope and coverage, and in the region-wide collaboration involved. Data obtained from the ICP were valuable input for comparing levels of activity and per capita income across regional economies, estimating a new poverty line to determine poverty levels, and assessing progress toward the United Nations Millennium Development Goals relating to poverty reduction.

Apart from coordinating the region's ICP activities in 2005, ADB assisted in building statistical capacity in the region's NSOs and developed statistical expertise in its own Economics and Research Department. Hence, the 2005 ICP was a major statistical project that provided an ideal opportunity for collaboration between ADB and the national implementing agencies toward the development and appreciation of ICP in the region.

Research Study on Poverty-Specific PPPs in 2005 for Asia and the Pacific

A valuable spin-off from the 2005 ICP in Asia and Pacific region was a research study on poverty-specific PPPs in 2005. Before the 2005 ICP, the World Bank had established an "absolute poverty line," which was the equivalent in local currency of US$1.08 per day (often referred to as "US$1 a day"). On the basis of the 2005 PPPs, the absolute poverty line was raised to US$1.25. Converting this "dollar a day" threshold into local currency will produce significantly different outcomes, depending on whether the conversion is made via exchange rates or via PPPs. International organizations use PPPs to measure the purchasing power in local currency of the absolute poverty line 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 economies, including lower income economies. Therefore, in the 2005 ICP round, the Poverty Advisory Group (PAG) established by the ICP Global Office identified the expenditure categories (referred to as "basic headings")[5] covering goods and services most important to the poor (e.g., food, clothing and footwear, housing, and health). Recognizing that poverty-specific PPPs are important for the accurate measurement of poverty incidence and the formulation of policies for poverty reduction, ADB did a research study on poverty-specific PPPs in 2005. Sixteen economies participated in this study; they were Bangladesh, Bhutan, Cambodia, Fiji, India, Indonesia, the Lao People's Democratic Republic (Lao PDR), Malaysia, the Maldives, Mongolia, Nepal, Pakistan, the Philippines, Sri Lanka, Thailand, and Viet Nam.

The study aimed to develop a methodology that would provide significantly improved PPPs for converting the international poverty line (IPL). The main goals of the poverty PPP study were to

(i) produce a set of poverty PPPs for converting the IPL and implement the methodology proposed by the PAG for the 2005 ICP;

2 Consisting of 21 ADB member economies: Bangladesh; Bhutan; Brunei Darussalam; Cambodia; the People's Republic of China (PRC); Fiji; Hong Kong, China; India; Indonesia; the Lao People's Democratic Republic (Lao PDR); Malaysia; the Maldives; Mongolia; Nepal; Pakistan; the Philippines; Singapore; Sri Lanka; Taipei,China; Thailand; and Viet Nam, and two nonmember economies, the Islamic Republic of Iran and Macao, China, which participated at their request.

3 ADB. 2007. *2005 International Comparison Program in Asia and the Pacific: Purchasing Power Parities and Real Expenditures.* Manila: ADB. http://www.adb.org/publications/purchasing-power-parities-and-real-expenditures

4 World Bank. 2008. *Global Purchasing Power Parities and Real Expenditures: 2005 International Comparison Program.* Washington, DC: World Bank. http://siteresources.worldbank.org/ICPINT/Resources/icp-final.pdf

5 The basic heading is defined as the smallest national accounting aggregate for which expenditure data are provided for the ICP.

(ii) collect prices of goods and services considered typical of consumption patterns of the poor and conduct poverty-specific price surveys in the participating economies;
(iii) compile poverty PPPs using price data collected from poverty-specific price surveys;
(iv) use various analytical approaches to study the sensitivity of PPP estimates derived from diverse sources of price data;
(v) identify a poverty line better suited to Asia and the Pacific region than the conventional IPL; and
(vi) estimate poverty incidence by applying the new IPL, converted using the derived poverty PPPs. To analyze poverty, PPPs were computed for a basket of goods and services typically purchased by poor households, using expenditures as weights to combine basic heading PPPs for those households. The expenditure patterns for households living in poverty were generally obtained from household income and expenditure surveys (sometimes called "household budget/expenditure surveys").

The poverty PPP estimation was designed to provide important inputs for future compilations of poverty PPP. Aside from compiling PPPs to convert the IPL according to the methodology endorsed by the PAG, the study also looked into the sensitivity of the estimated poverty PPPs to different sources of price data—prices from the 2005 ICP in Asia and the Pacific region and prices from the poverty-specific price surveys. Effects of the different weights and aggregation methodologies were likewise examined to help identify a suitable approach and methodology for compiling poverty PPPs in the future. The results of the study, which was released in 2008,[6] provides details on the activities undertaken for the poverty PPP study and new estimates of poverty PPPs derived using both the PAG's methodology and the poverty-specific price surveys.

The 2009 PPP Update

An ICP benchmark provides a snapshot of real expenditures and the relationship between participating economies in a particular reference year. Analysts, however, are interested in obtaining annual estimates for real expenditures. It is not easy to transform data from an ICP benchmark into a time series. In particular, extrapolating PPPs based on GDP growth rates from a benchmark will rarely match precisely with a new benchmark when it becomes available several years later. The longer the gap between benchmark years, the more likely it is for the discrepancy between an extrapolated series and the new benchmark to be significant. Having benchmarks as close together as possible reduces the impact of such a discrepancy. However, conducting an annual ICP benchmark is a costly and time-consuming process.

Shortly after the results of the 2005 ICP were published, ADB started working on initiatives to address the issue of extrapolation, improve the operational aspects of the ICP, and minimize costs faced by member economies in collecting ICP price data.[7] Harmonizing ICP price collection with price collection for consumer price indexes (CPIs) in member economies was one such initiative. ADB held a workshop in January 2008 to discuss the possibility of integrating ICP requirements into the regular price collection activities of NSOs. Among the issues that were brought up during the

6 ADB. 2008. *2005 International Comparison Program in Asia and the Pacific: Research Study on Poverty-Specific Purchasing Power Parities for Selected Countries in Asia and the Pacific.* Manila. http://www.adb.org/Documents/Books/Poverty-Purchasing-Power-Parities/Poverty-Specific-PPP.pdf

7 In the ADB report on the 2005 ICP (ADB. 2007. *2005 International Comparison Program in Asia and the Pacific: Purchasing Power Parities and Real Expenditures*) the "Lessons Learned" section contained the following note: 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 is not considered. 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 list was established, which will also make it difficult to harmonize the ICP and CPI product lists.

workshop were the difficulties involved in fully integrating ICP price collection into the CPI price surveys. The main problems related to (i) whether the ICP products fully represented the economy, particularly across a range of store types and in all localities within an economy; (ii) the incompatibility of ICP requirements for obtaining a national average price with the CPI procedures related to pricing locality-specific products for the CPI; (iii) the identification of appropriate products in rural areas (and their pricing); and (iv) the resource demands imposed on NSOs by the additional data collection. Concerns were also expressed about the usefulness of ICP data for national purposes, with the main users being international organizations rather than agencies within any of the participating economies.

As part of the lead-up to the workshop, eight economies[8] participated in a survey of their CPI price collection procedures. The outcomes were an important input into the workshop discussions. Fully incorporating ICP requirements into ongoing price collections was considered not feasible because of the costs involved. Therefore, three means of integrating the ICP and CPI data collection were discussed at the workshop.

The first was to use a "rolling benchmark" approach to collecting ICP prices. It involves pricing approximately one-sixth of the products in each of the 6 half-years during a 3-year period. The ICP prices are then estimated by using changes in the corresponding CPI product prices to adjust them to the price level of the benchmark year. This procedure is being used successfully by the OECD and Eurostat in their joint PPP program. An important advantage is that the workload during the ICP price collection period is spread evenly over time rather than concentrated in a single year. In addition, estimates of PPPs and real expenditures for the years between benchmark years become more accurate.

The second approach considered was to develop the lists of products to be priced on a subregional basis rather than for Asia and the Pacific region as a whole. The advantages of subregionalization are that the product lists for each subregion could include a smaller range of products than the current regional list, and quality differences in the products priced are likely to be less significant than those in a regional list. As a result, it would be easier to use prices of products collected for the CPI. However, the subregional results would have to be linked together in some way to produce the PPPs and real expenditures for the region as a whole—a major disadvantage, given that regional linking proved to be one of the most difficult issues to resolve in the 2005 ICP.

The third method discussed was to develop a core product list, which would be priced regularly and supplemented by some specially collected product prices in an ICP benchmark year. Full details of the outcomes of the study as reported during the January 2008 workshop can be found in the *ADB Economics Working Paper* series entitled Integration of Consumer Price Indices and the International Comparison Program for Asia and the Pacific Region: How Can They Be Achieved?[9]

In consideration of the 2005 ICP recommendations, ADB implemented the research initiative under RETA 6482 to provide an alternative methodology for extrapolating PPP. The research initiative, termed "The 2009 PPP Update" (the Update) provides an alternative to the extrapolation methodology. It provides an intermediate benchmark for 2009. The Update would have a more firmly based real expenditure for 2009 than would have been possible via the commonly used extrapolation technique. The aim was to update the 2005 PPPs to 2009 but in a limited way so that the costs involved would be much less than those for a full benchmark ICP. In addition, it provided a firm step-off point for collecting and compiling the data required for the 2011 ICP.

Compared with the full 2005 ICP, the Update was a small-scale data collection exercise in terms of products priced, frequency of price collection, and geographic coverage within the region's economies. A core list of items was developed from the full list that had been specified for the 2005 round. The price collection surveys for products in household final consumption

8 Bangladesh, the PRC, India, Indonesia, Malaysia, the Philippines, Thailand, and Viet Nam.

9 ADB. 2008. Integration of Consumer Price Indices and the International Comparison Program for the Asia and Pacific Region: How can They be Achieved? *ADB Economics Working Paper Series* No. 143. Manila: ADB. http://www.adb.org/Documents/Working-Papers/2008/Economics-WP143.pdf

expenditure were carried out once in each quarter of 2009 in each economy's capital city (plus some major cities when products could not be priced in the capital city), rather than across all localities. However, the PPPs and real expenditures estimated from these prices related to the full scope of economic activity as defined in the 1993 System of National Accounts (1993 SNA). Apart from providing PPPs that will allow comparisons of activity levels for economies in the region in 2009, it is also intended to improve existing methodologies and develop new ones that could be adopted for the 2011 ICP.

2 Overview of Purchasing Power Parities

Introduction

This section gives an overview of the conceptual framework for cross-country comparisons, focusing on the underlying principles of PPPs and their uses in economic analysis as well as their limitations. The section explains bilateral and multilateral PPPs and why it is important to compare countries in terms of real expenditures. Explanations on the methodologies for price and volume comparisons are also provided, along with the advantages of using PPPs over exchange rates and the use of the two price indicators (PPPs and exchange rates) to derive price level indexes.

Purchasing Power Parities

A method often used to convert values for intercountry comparisons, such as those in the national accounts data, from a national currency to a common currency is to use exchange rates. The most common comparison is to convert an economy's GDP into US dollars via the economy's US dollar exchange rate. An exchange rate reflects the "price" of a foreign currency, i.e., the number of units of an economy's national currency required to purchase one unit of a foreign currency. It is appropriate in some circumstances to use exchange rates for international comparisons, but it is often misleading to do so in other cases. For example, exchange rates provide the appropriate conversion factor for calculating the amount of goods and services that could be imported with the proceeds of a particular level of exports or for calculating domestic currency costs of purchasing foreign goods and services abroad. However, to assess standards of living in two or more economies it is necessary to compare the volumes (most commonly referred to in the ICP as "real expenditures") of goods and services that are actually available to residents in their economies. PPPs take into account that many non-traded services are cheaper in a low wage economy than would be implied by converting the values of such services into a common currency using exchange rates. Further, exchange rates are influenced by factors other than domestic price levels in different economies. For example, financial flows and interest rate differentials can have a significant effect on exchange rates, as can non-economic issues such as the political stability of economies. Hence, using exchange rates to convert the national currency values can be misleading because they generally overstate the price, and consequently understate the volume of domestic services produced in developing economies. PPPs are specifically designed to adjust for both exchange rates and the effects of different internal price levels between economies.

PPP is a price relative defined on the basis of price observations over space (either regions or economies). It is similar to the price relatives used in producing a price index such as a CPI. The key difference is that in a CPI price relatives are calculated for the same product in the same economy in different periods (changes in prices over time) but in PPPs, price relatives are the ratios of prices for the same product in the same period in two different locations (economies, or regions within an economy).

Bilateral and Multilateral Comparisons of Purchasing Power Parity

In practice, PPPs are calculated by comparing prices between economies for a specified basket of goods and services that are included in GDP. A simple example is when only two economies are being compared (referred to as a "bilateral comparison"). The resultant PPPs can be expressed in terms of the currency of either of the pair of economies. In such a case, the PPP for a particular product (good or service) is the rate of exchange at

which the currency of the first economy would have to be converted into the currency of the second to purchase the same quantity and quality of the product in both.

The Big Mac Index is the simplest and most celebrated example of a one-product PPP that is regularly presented by the *The Economist* news magazine. It shows the relative levels of the price and volume of Big Mac hamburgers among various economies. This form of presentation provides an indication of which economies are "expensive" (where the PPP for a Big Mac is higher than the exchange rate) and those that are "cheap." Note that by taking the price of a Big Mac in estimating the PPP, it is assumed that each economy in the comparison is pricing exactly the same Big Mac item that strictly follows the specifications (regarding quality, weight, presentation, service type, ambiance, etc.).

To illustrate, if a Big Mac costs HK$15.10 in Hong Kong, China and Rs84.00 in India, the PPP of the Big Mac is HK$0.180 (i.e., 15.10/84.00), using India as the "base" or "numeraire" economy. The PPP of 0.180 for Hong Kong, China means that it would cost HK$0.18 in Hong Kong, China to purchase the same quantity and quality of Big Mac that could be purchased for Rs1.00 in India. Using the Hong Kong dollar as the base currency, the PPP is Rs5.563 (i.e., 84.00/15.10), which means it would cost Rs5.56 in India to purchase the same quantity and quality of Big Mac that could be purchased for HK$1.00 in Hong Kong, China. Even though these PPPs are expressed in different currencies, the results present the same picture because the relationships between them are the same (5.563 is the reciprocal of 0.180).

The ICP creates similar comparisons but unlike the Big Mac Index, the ICP PPP relates to a basket of goods and services and PPPs are calculated for aggregated product groups. The ICP takes into account the relative prices between countries from a broad range of well-defined goods and services that are included in the GDP, making it a multilateral comparison. The 2005 ICP for Asia and the Pacific region, with 23 economies participating, is referred to as a "multilateral comparison." It is a much more complicated exercise than a bilateral one, in terms of both the underlying concepts and the practical difficulties that arise from having to compare so many diverse economies.

Real Expenditures

The approach used to obtain real expenditures, expressed in a common currency, is similar to that used in estimating volumes in the time series national accounts. In a time series, a volume is usually calculated by dividing a current value by a price index that measures the change in prices from a base period for the range of products included in that current value. The volumes calculated in this way are measures of values that have the effects of price changes (over time) removed from them (hence the term "volume"). A similar procedure is used to calculate real expenditure to compare values between economies after removing differences in price levels between the economies. In this case, the real expenditure is equal to the value recorded in the national currency divided by the corresponding PPP. Real expenditures are expressed in terms of a common currency, often referred to as the "numeraire currency." The choice of numeraire currency affects the levels of real expenditures recorded but does not change any of the relationships in real expenditures between economies.

Using PPPs to calculate real expenditures requires prices of products in each expenditure component (known as "basic heading") of GDP, as well as the corresponding expenditure values for each basic heading from participating economies. Prices collected for each product have to be combined into national annual average prices by estimating an annual price for each product using prices collected on a weekly, monthly, or quarterly basis and averaging these prices for each product for each economy into a national price for the year. The geometric mean of the prices for all products within each basic heading in each economy is then used to obtain PPPs for each basic heading in each economy. Real expenditures expressed in a numeraire currency are estimated for each basic heading by dividing the national accounts basic heading values (expressed in national currency) by these PPPs.

Several alternative methods are available to aggregate basic heading real expenditures to higher levels of expenditures (including GDP). In deciding which method to use, some important characteristics of PPPs should be considered. The first is that the choice of the base economy (i.e., the one with which other economies are compared) should not affect the relativities observed

between any pair of economies (in the region); the PPPs are, therefore, termed "base-country invariant."

The second is that the PPPs should be transitive.[10] A less formal way of expressing this characteristic is that a direct comparison between economy A and economy B gives the same results as an indirect comparison between economies A and B via a third economy C (i.e., combining the relationships between A and C, and between B and C will yield the same result as the direct comparison between A and B). Transitivity is important because it means that comparisons made between any pair of economies are mutually consistent.

Methodology for Price and Real Expenditure (Volume) Comparisons

A commonly used method of calculating PPPs at the basic heading level is the country-product-dummy (CPD) method, which is a regression-based, multilateral approach (i.e., taking all economies into account simultaneously). The basic heading PPPs obtained in this way are transitive and the CPD has the added advantage of providing diagnostic tools that are useful in editing prices underlying the PPPs.[11] The next step is to aggregate basic heading PPPs to the expenditure levels above the basic heading, including GDP. The method chosen for this stage was the EKS method, which is named after its originators, Eltetö, Köves, and Szulc. The first step in the EKS method is to compare all pairs of economies and compute non-transitive bilateral PPPs. The next step is to take the bilateral PPPs and convert them into multilateral transitive PPPs.[12]

Once transitive PPPs have been calculated for all basic headings and for higher level expenditure aggregates, including GDP, they can be used to estimate real expenditures by dividing the basic heading value expressed in national currency by the corresponding PPP. One disadvantage of the EKS method is that real expenditures, obtained using the PPPs derived by this method, are not additive, i.e., the real expenditure on GDP is not equal to the sum of all the basic headings. However, this disadvantage is considered to be outweighed by the fact that the results are not biased, unlike those produced by additive aggregation methods such as the Geary-Khamis (GK) method.

Purchasing Power Parity or Exchange Rate?

Debates have arisen about whether PPPs or exchange rates should be used for international comparisons. The answer is, both are useful in different circumstances and, hence, it is more important to know when it is appropriate to use PPPs or when exchange rates should be used to convert values into a common currency. In practice, PPPs are generally required to calculate levels of activity and related indicators (e.g., per capita volumes) but exchange rates are sometimes more appropriate for comparing relative levels of financial aggregates. These uses are summarized below.

In broad terms, PPPs should be used to

(i) calculate volumes (i.e., real expenditures) of GDP (also GDP volumes per hour worked, and per capita GDP volumes);
(ii) calculate volumes of components of GDP, such as consumption or fixed capital formation;
(iii) calculate price levels;
(iv) convert the $1.25-a-day IPL to local currency units;
(v) calculate per capita consumption or GDP values used in computing Gini coefficients; and
(vi) aggregate individual economy's GDP and related data to regional and world totals (e.g., GDP for the whole of Asia and the Pacific), so that share of regional totals can be calculated.

Some key uses of PPPs and PPP-based volumes, and per capita volumes of GDP are to

(i) analyze the extent of convergence in real incomes and prices across economies;
(ii) measure the levels and trends in inequality in real GDPs between economies (and between regions within an economy);
(iii) help establish aid policies for less developed economies; and
(iv) calculate cost of living adjustments for people assigned to posts in foreign economies.

10 The *Eurostat-OECD Methodological Manual on Compiling Purchasing Power Parities* defines transitivity as "...the property whereby the direct PPP between any two countries (or regions) yields the same result as an indirect comparison via a third country (or region)."
11 The CPD method is described in detail in Appendix 1.
12 The EKS method is described in detail in Appendix 2.

Exchange rates should generally be used to convert

(i) the value of an economy's exports, to determine its ability to purchase imports;
(ii) the value of the balance of payments current account balance;
(iii) financial data (such as the volume of investment goods that could be purchased for a given amount of foreign direct investment); and
(iv) share prices.

There are instances when it is not necessary to convert values in local currency to a common currency. The following indicators are best analyzed between economies when expressed in their own currency:

(i) growth rates (i.e., percentage changes) in GDP and its components between economies;
(ii) productivity growth rates;
(iii) inflation (e.g., percentage changes in a CPI);
(iv) ratios of national accounts aggregates to GDP (e.g., the ratio of government deficit to GDP or of government debt to GDP); and
(v) shares of different sectors of the economy in GDP (e.g., the percentage of GDP contributed by agricultural gross product).

Price Level Index: Linking Purchasing Power Parity and Exchange Rates

Direct PPP comparisons between economies do not provide much information in their own right. Their importance lies in their use in conjunction with other data. This includes calculating the levels of GDP and its major components in a common currency (i.e., "real expenditures") and dividing PPPs by the countries' exchange rates to produce what is known as price level indexes (PLIs). The term "PLI" is formally defined as the ratio of a PPP to a corresponding exchange rate (times 100). The main use of a PLI is to determine how price levels in economies compare with each other.

Taking the Big Mac example a step further will demonstrate how a PLI is calculated. If the exchange rate is HK$1.00 = Rs5.66 then the PLI for a Big Mac in India with Hong Kong, China as the base (i.e., equal to 100) is 98.31 (= 5.563(5.66/1.00)*100). This indicates that, given the relative purchasing power of the Hong Kong dollar and the Indian rupee, a Big Mac would be more expensive in Hong Kong, China than in India. Conversely, the PLI in Hong Kong, China using India as the base would be 101.72 (= 0.180/(1.00/5.66)*100). This Big Mac example shows how a PLI can be used to compare relative price levels across countries for a more complex data set such as household final consumption expenditure or GDP.

Limitations of Purchasing Power Parity

PPPs are a powerful tool for economic analyses, but there are limitations. First, PPPs do not provide an indication as to what the exchange rate "should be." When the theory of PPPs was first developed, it was argued that PPPs would be close to "equilibrium exchange rates" if all the goods are freely traded. But PPPs cover not only tradable products but also nontradables such as construction, personal services, and government services. In any event, exchange rates are determined by the total demand for a particular currency, and financing foreign trade is only one component of this demand. PPPs, therefore, cannot be used to determine a country's "correct" or "equilibrium" exchange rate. This is determined by international currency markets.

Second, PPPs are statistics and, therefore, subject to both sampling and nonsampling errors. National accounts statistics that are used as weights in combining PPPs at basic heading level to higher levels of aggregation also contain similar errors. When PPPs and national accounts are combined into total GDP or per capita GDP (in PPP terms), the resulting per capita real GDPs cannot be used to establish strict rankings between economies. Rankings should be used cautiously when differences between economies are relatively small. A rule of thumb commonly used is that differences of less than 5 percentage points between economies' per capita real expenditures on GDP are not statistically significant. The reliability of PPPs and real expenditure measures also depend on the level of detail. At a more aggregated level, PPPs are likely to be more reliable. For example, PPPs for bread and cereals are likely to be more reliable than PPPs for just rice. PPPs for food and nonalcoholic beverages would be more reliable than PPPs for food alone. This has been an important consideration in determining the optimal level of data disaggregation for presenting PPPs and real expenditures.

Finally, time series of different benchmark estimates of real GDP (in PPP terms) are not directly comparable over time. Real GDP provides a snapshot of the relative real GDP levels among participating economies for a given benchmark year. When benchmark PPP estimates are placed side by side, these snapshots may appear to provide a moving picture of relative real GDP levels over the years, but this apparent time series of real GDP is actually similar to a current price time series showing the combined effect of changes in relative price levels and changes in relative real GDP levels. Within each year, the indexes are at a uniform price level, but the uniform price level changes from one reference year to the next.

To construct a comparable time series of real GDP for a group of economies, each economy's GDP figures should be converted to a numeraire currency using PPPs for a selected base year. For example, the latest version of the Penn World Tables provides real series that are comparable across economies and over time for 1950–2004, with 2000 as the PPP base year. Similarly, the Maddison series are all expressed in constant 1990 US dollars. The time series expressed in this manner will have growth rates identical to those in each economy's time series national accounts. Among the main uses of such series is to enable regional (global) totals to be calculated so that volume growth rates can be calculated at the regional (global) level.

The 2009 Purchasing Power Parity Update in Asia and the Pacific

3

Introduction

Compared with a full ICP round, the Update was a relatively small-scale exercise. It covered only 279 products, or about 43% of the original list for household final consumption items in the 2005 ICP in Asia and the Pacific. Further, unlike the full ICP round, it collected prices only in the capital cities and not in the entire economy. However, all components of the GDP expenditures were covered in price data collection, and included household consumption and government consumption aggregates, and the construction and machinery and equipment components of gross fixed capital formation. As was the case in the 2005 ICP in Asia and the Pacific, the PPPs for a number of household basic headings, as well as for inventories, acquisition of valuables, exports, and imports of goods and services, were based on reference PPPs which are PPPs based on basic headings for which no prices are collected. A substantial portion of this section is drawn from *Updating 2005 Purchasing Power Parities to 2009 in the Asia and Pacific Region: Methodology and Empirical Results ADB Economics Working Paper Series*. No. 246. Manila, ADB.

In summary, the aim of the Update was to be less resource intensive than a regular ICP benchmark. In particular, the Update aimed to:

(i) provide more firmly based regional price and volume comparisons of GDP and its major component expenditures for 2009 than could be obtained by extrapolating PPPs from the 2005 ICP benchmarks;
(ii) address issues relating to the integration of the ICP with national statistical work as far as possible by linking ICP requirements with the economies' national accounts and price statistics programs;
(iii) continuously develop and maintain the expertise of both price and national accounts staff of ADB member economies, and capitalizing on synergies from the 2005 round toward retaining the skills developed in ADB and in the NSOs and related agencies;
(iv) advocate PPP concepts and methodologies and the use of CPI information for subnational or intraregional PPP calculation;
(v) provide a solid starting point for estimating the detailed national accounts data required for the 2011 ICP by having firm estimates for 2009, which is much closer to the 2011 reference year than the previous benchmark year of 2005; and
(vi) harmonize ICP and CPI price collection activities by including ICP products in the current CPI product list to the extent possible in each economy. One of several lessons learned in the 2005 ICP was that integration between products priced in individual economies' CPIs and those specified for pricing in the ICP was low. The Update provides an opportunity to better integrate these data sets, thus providing long-term benefits in terms of reduced costs in participating in future ICP rounds

To meet the objectives of the study and successfully update the 2005 PPPs for Asia and the Pacific to 2009, the following procedures were implemented in the Update:

(i) A core list of household consumption products (core product list) were identified from the 2005 ICP in Asia and the Pacific product list for pricing in 2009 and to be used in the 2009 PPP computation.
(ii) Scaling factors were established to adjust PPPs generated from the Update core product list to the 2005 PPPs from the 2005 ICP in Asia and the Pacific product list.
(iii) Scaling factors were computed to adjust capital city prices to national annual average prices using

either CPI information from national sources or information from price data collected for the 2005 ICP in Asia and the Pacific.

(iv) The frequency of collecting prices for household shop items was minimized to once every quarter.

(v) CPI-ICP harmonization was increased by attempting to integrate the core product list into the regular national price collection activities to the extent possible to facilitate the collection of prices for the Update.

(vi) A framework was established for using CPI information to estimate subnational or intra-economy price level PPPs for subregions within an economy.

(vii) The importance of adopting PPP concepts and methods at subnational levels, especially in large and geographically diverse economies such as Bangladesh, the PRC, India, Indonesia, Malaysia, the Philippines, Sri Lanka, Thailand, and Viet Nam, was emphasized.

Another important aspect of the Update methodology was to test if the Update procedure could meet users' requirements for up-to-date and more frequent "benchmark" PPP data rather than having to wait for the next ICP benchmark. The successful completion of the Update could provide useful insights in updating ICP benchmarks at relatively low cost compared with a full ICP round.

Conventional Method of Extrapolating Purchasing Power Parity

The conventional method of deriving annual PPPs is by extrapolating benchmark PPPs using time series national accounts data. This method applies the changes in the ratio of the GDP deflator for each economy to the GDP deflator of the base or numeraire country (e.g., the US).

Paragraphs 15.232 and 15.233 of the *2008 System of National Accounts*[13] formally describe the method commonly used to extrapolate PPPs from a benchmark year as follows:

> The method commonly used to extrapolate PPPs from their benchmark year to another year is to use the ratio of the national accounts deflators from each country compared with a numeraire country (generally the United States of America) to move each country's PPPs forward from the benchmark. The PPPs derived are then applied to the relevant national accounts component to obtain volumes expressed in a common currency for the year in question.
>
> Theoretically, the best means of extrapolating PPPs from a benchmark year would be to use time series of prices at the individual product level from each country in the CPI to extrapolate the prices of the individual products included in the ICP benchmark. In practice, it is not possible to use this type of procedure in extrapolating PPP benchmarks because the detailed price data needed are not available in all the countries. Therefore, an approach based on extrapolating at a macro level (for GDP or for a handful of GDP components) is generally adopted. Leaving aside the data problems involved in collecting consistent data from all the countries involved, a major conceptual question arises with this process because it can be demonstrated mathematically that it is impossible to maintain consistency across both time and space. In other words, extrapolating PPPs using time series of prices at a broad level such as GDP will not result in a match with the benchmark PPP-based estimates even if all the data are perfectly consistent.

The method above has the advantage of being simple to implement and the data required are readily available for any economy that has a set of annual national accounts. In many cases, extrapolated PPPs obtained using the conventional method are good approximations of those that would have been obtained from a benchmark, and so they fit in well between two benchmarks. However, the disadvantage is that the extrapolated PPPs may be inaccurate in some cases because assumptions behind this process are restrictive and may not be met in practice.

Currently, the global PPP data for research has two main sources: the Penn World Tables (PWT)[14] produced by the University of Pennsylvania and the World Bank

[13] United Nations Statistics Division. 2008. *System of National Accounts.* http://unstats.un.org/unsd/nationalaccount/sna2008.asp

[14] University of Pennsylvania. *Penn World Tables.* Philadelphia: University of Pennsylvania. http://pwt.econ.upenn.edu/php_site/pwt_index.php

estimates[15] as published in the *World Bank Development Indicators* (WDI). It should be noted that both sources use the same basic data for the benchmark years with some differences in aggregation methods used and estimation of non-benchmark countries. For estimates of non-benchmark years, the World Bank uses growth rates of the total GDP to extrapolate to non-benchmark years while PWT uses national personal consumption and government and investment component growth rates and then combines them into real GDP using component shares in real terms (in international dollars, US$—being the numeraire country for the benchmark years) as estimated in PWT exercise. Consequently, their implied GDP growths from the extrapolated GDP in PPP terms for non-benchmark years will have observed differences.

The PPPs obtained by extrapolating from a benchmark using time series data will almost certainly differ from those calculated in a full ICP round. Both conceptual and practical problems contribute to these differences. Dalgaard and Sørensen (2002) showed that it is conceptually impossible to match PPPs extrapolated using time series national accounts with PPPs from a benchmark ICP.[16] They concluded that "…it is not reasonable to say that PPP benchmarks and national price and volume data are 'inconsistent' when they fail to satisfy simultaneous transitivity across space and time" (Dalgaard and Sorensen. 2002, page 4). Ideally, to minimize any such differences, PPPs would be extrapolated from 2005 using detailed price data at the level of the 155 basic headings. However, as economies do not have consistent time series price indexes at this very detailed level, extrapolation for non-benchmark or in-between ICP benchmark years is generally based on the deflator for GDP only. At best, it would be based on using deflators for a handful of major components of GDP. The process involves the calculation of the change in the ratio between the GDP deflator for each economy with that of the numeraire economy (say, Hong Kong, China) for each year, with 2005 being the benchmark year. The percentage change in the ratio of a country's GDP deflator to Hong Kong, China's GDP deflator for each year is used to extrapolate the benchmark 2005 PPPs for each economy (it can also be used to back-cast PPPs for years before 2005). The PPPs estimated for each year using this procedure are divided into the corresponding year's value of GDP for each economy to produce a PPP-based GDP volume or real expenditure.

The main assumptions underlying the process of simply extrapolating a benchmark PPP using the relationship between changes in different economies' GDP deflators are that economies have similar economic structures as in the benchmark year and their structures change at the same rate over time. These are very restrictive assumptions. In addition, the weights applied to individual price indexes that are combined to produce GDP deflators in the time series national accounts will change over time and these changes will not be identical between the economies involved in the extrapolation process. Prices used in the GDP deflators will be different from those in the PPP benchmarks for GDP. In a time series, the main requirement is that prices collected should be for similar products to be priced over time. Quality adjustments are applied to the time series price indexes to take into account changes in product specifications over time. On the other hand, the main requirement in spatial price indexes is for the products priced to be representative within each economy and comparable between economies, so the basket of products priced for the ICP may be quite different from those in each economy's time series national accounts. Another potential problem arises if an economy's terms of trade change markedly over time because this extrapolation method assumes that changes in prices due to changes in the terms of trade are price effects, whereas they are treated as volume effects in a benchmark PPP. The study of Varjogen in 2002 provides a good overview of some inconsistencies between ICP benchmarks and extrapolated GDP figures. In his paper, Varjonen reports inconsistencies arising between benchmark and extrapolated PPPs to range from minus 13.6% for Turkey to plus 11.7% for Greece during the 1990–1999 period.[17] The paper by Dalgaard and Sørensen (2002) also highlight some large discrepancies between the benchmark and extrapolated series for some countries but note that revisions made in national accounts data after the benchmark PPPs were calculated are at least partly responsible for their magnitude.

15 World Bank. 2010. *2010 World Development Indicators*. Washington, D.C.: World Bank.

16 Dalgaard, Esben, and Henrik Sejerbo Sørensen (Statistics Denmark). 2002. —Consistency between PPP Benchmarks and National Price and Volume Indices. Paper prepared for the 27th General Conference of the International Association for Research in Income and Wealth, Stockholm, August 2002. www.iariw.org and www.econ.nyu.edu/iariw

17 S. Varjonen. 2002. *Improving the Quality of PPP Series.* OECD. www.oecd.org/dataoecd/512/1961624.pdf

Despite the limitations in the current extrapolation methodology, some useful results can still be obtained by extrapolation, provided that the years extrapolated are not too far removed from the benchmark year. It is in this context that the Update attempts to provide a more firmly based set of PPPs than could be obtained using the simple and broad-level extrapolation procedures that would address or avoid the limitations of the conventional extrapolation methodology.

The 2009 PPP Update Methodology

The Update is a compromise between the lengthy gap between PPP benchmark years and the costs to economies of producing time series of price indexes at a very detailed level to extrapolate basic heading PPPs. It must, however, be stressed that the Update was a research initiative intended to explore an alternative methodology to the conventional method of extrapolating PPPs for in-between benchmark years.

The Update was designed to produce the same data sets as those in the 2005 ICP. The basic headings used were identical to those in the 2005 round and the results are available in the same degree of detail as those published in the 2005 ICP. The main difference between the 2005 round and the Update is that "shortcut" methods were used in 2009 to obtain prices required to produce the PPPs. In particular, the reduced product list adopted for the Update was considered appropriate for a "between benchmark process" as an alternative to the simple extrapolation method. The following section describes the scope and coverage of the Update and the methodology employed.

Scope and Coverage of Data Collection

In view of the project's objectives, the price surveys for household consumption items were limited to capital cities and conducted once every quarter of 2009. This enabled a significant reduction in cost and resource requirements compared with a benchmark ICP where prices are collected at higher frequencies (weekly, bimonthly, or monthly, depending on the variability of the items) and with national coverage, based on sampling procedures to ensure national representativity. For non-household components of machinery and equipment (M&E), construction, and compensation of employees, a one-time price collection in the capital city was conducted. Construction data were collected in July 2009 while prices for M&E were collected in the last quarter of 2009. Compensation data for 2008 were provided in August 2009 and 2009 compensation data were submitted in February 2010.

In terms of item coverage, only subsets of the products included in the 2005 ICP were identified for pricing by each economy. The full product list for the 2005 ICP for Asia and the Pacific consisted of 656 goods and services for household, 34 basic input items and complex items for construction, and 262[18] M&E items for gross fixed capital formation. To achieve the low cost objective, core or reduced lists were identified for both household and gross fixed capital formation. The combinatorial approach described in the ensuing section was used to achieve an optimum combination of products that would yield similar results as those obtained when collecting the prices for the full list for each basic heading. A summary of the number of products priced in the Update vis-à-vis those in 2005 for each of the major expenditure components of GDP is presented in Table 1.

Item Coverage

Household consumption items. Of the 656 products from the 2005 ICP full list, 269 were initially selected for the Update core list and economies were requested to price each of these items as in the 2005 ICP. After the first quarter price collection, the list was increased to 279 products. Additional products needed to be priced since some products were no longer available in a number of economies.

Construction. Ten of the 34 basic input items were considered relevant for calculating PPPs for this sector and were categorized as follows:

(i) Materials: aggregate for concrete, plywood, Portland cement, reinforcing steel, sand used for concrete and cement mortar,
(ii) Hired equipment: backhoe, vibratory plate compactor, sand filter.
(iii) Labor services: skilled (7 types) and unskilled (1 type).

18 The number of M&E products increased to 262 as a result of regrouping of the items priced by participating economies.

Table 1. Number of Basic Headings and Items Priced, Gross Domestic Product by Major Aggregates, and Groups, 2005 and 2009

Aggregate/Group		Number of Basic Headings	Number of Items	
			2005	2009
GROSS DOMESTIC PRODUCT	**a+u+v+z+aa**	155	833	402
Actual Final Consumption	**a = b+p+q**	132	676	299
Individual Consumption Expenditure By Households	b = ∑ (c to o)	110	658	281
Food and Nonalcoholic Beverages	c	29	211	84
Alcoholic Beverages, Tobacco, and Narcotics	d	5	19	9
Clothing and Footwear	e	5	71	26
Housing, Water, Electricity, Gas, and Other Fuels	f	7	14	10
Furnishings, Household Equipment, and Routine Maintenance of the House	g	13	82	32
Health	h	7	70	26
Transport	i	13	48	23
Communication	j	3	14	8
Recreation and Culture	k	13	61	31
Education	l	1	6	6
Restaurants and Hotels	m	2	21	8
Miscellaneous Goods and Services	n	10	39	16
Net Expenditures of Residents Abroad	o	2	2	2
Individual Consumption Expenditure By Non-Profit Institutions Serving Households-NPISHs	p	1	Ref	Ref
Individual Consumption Expenditure By Government	q = ∑ (r to t)	21	18	18
Health	r	12	13	13
Education	s	6	5	5
Others	t	3	Ref	Ref
Collective Consumption Expenditure By Government	u	5	32	32
Gross Fixed Capital Formation	v = ∑ (w to y)	12	125	71
Machinery and Equipment	w	8	91	61
Construction	x	3	34	10
Other products	y	1	Ref	Ref
Changes in Inventories and Net Acquisitions of Valuables	z	4	Ref	Ref
Balance of Exports and Imports	aa	2	Ref	Ref

Ref = reference PPPs were used.

Machinery and equipment. A total of 61 products were included in the core list and broken down by major component as follows: general purpose machinery (10), special purpose machinery (26), electrical and optical machinery (19), and motor vehicles and trailer (6). Initially, an indirect methodology for computing PPPs for M&E based on information on imports, freight and insurance costs, trade margins, applicable duties (taxes, customs duties, subsidies), and installation costs was considered. With this methodology, the changes in relative PPPs would be calculated as the change in real exchange rates adjusted for the cost components. It was assumed that the share of applicable duties would remain the same between 2005 and 2009, while the share of the other costs for M&E imports would be estimated from trade and balance of payments statistics and from the commodity flow matrix for economies using the commodity flow method to estimate gross fixed capital formation. This method is described in depth in "Annex on Use of Exchange Rates as Approximate PPPs for Machinery and Equipment" (Chapter 9: Gross Capital Formation, *ICP 2003–2006 Handbook*).[19] However, after an assessment of data submitted by the economies, actual price collection using the core list approach was resorted to as most economies were unable to provide all the required information.

[19] http://siteresources.worldbank.org/ICPINT/Resources/270056-1183395201801/icp_Ch9_Annex.doc

Compensation of employees. Information on compensation was collected for the same set of 50 government positions as in 2005. The information covered 18 positions (13 for health services and 5 for education service) to allow an evaluation of individual expenditure by the government, and 32 positions for collective government services.

Inventories, valuables, exports, and imports. In the 2005 ICP, the PPPs used for these aggregates were reference PPPs. For inventories and valuables, the applicable reference PPPs were a combination of those for durable and nondurable goods and gross fixed capital formation (excluding referenced PPP basic headings), while the reference PPPs for exports and imports of goods and services were based on exchange rates. Reference PPPs were also used for a number of household basic headings as in the 2005 ICP. A full list of reference PPPs is in Appendix 3.

GDP values and weights. The Update used the latest available data on the major GDP components for 2009: actual final consumption by households, collective consumption expenditure by government, gross capital formation (including changes in inventories and net acquisitions of valuables), and balance of exports and imports of goods and services. Breakdowns of the major components of gross domestic expenditure into the 155 basic headings were estimated using the latest available data at the most detailed level possible. Where available, data from household expenditure surveys were used to estimate basic heading values for household final consumption expenditure if the national accounts data were not available in sufficient detail. If up-to-date information was not available, the basic heading structure from the 2005 ICP round was applied below the level at which the national accounts are compiled. For example, where 2009 data were available only for total food in household final consumption expenditure, the 2005 basic heading structure for the components of food was used to allocate the 2009 value to the respective basic headings under food.

Table 2 summarizes the scope and coverage of the major components of GDP and compares the differences between 2005 and 2009.

Table 2. Scope and Coverage of Major Aggregates, 2005 and 2009[a]

Aggregate	2005	2009
Household final consumption expenditure	656 items in the product list.	269 items in the product list plus 10 additional items (to account for obsolescence, etc.); adjustments were based on the relationship between prices for these products and those in the full list in 2005.
	Most prices were collected quarterly but for some products prices were collected more frequently (e.g., weekly for fruits and vegetables).	Prices collected quarterly.
	Price collection was nationwide.	Prices were collected in capital city only and where not available in the capital city, from a neighboring major city
Government final consumption expenditure	Compensation of employees collected for 50 government posts (18 posts for individual expenditure by government and 32 for collective government services).	Compensation of employees collected for the same 50 posts as in 2005.
Gross fixed capital formation in construction	Prices collected for 34 construction components and basic input items.	Ten basic input items from 2005 were priced.
Gross fixed capital formation in machinery and equipment	A global product list of 106 items was priced.	The starting point was the 2005 list, but product descriptions were updated to take into account changes in models between 2005 and 2009. Sixty-one items were priced in 2009.
Change in inventories and net acquisitions of valuables	Reference purchasing power parities were used.	The same reference purchasing power parities as in 2005 were used.

a 2005 refers to the 2005 International Comparison Program, and 2009 refers to the 2009 Purchasing Power Parity Update.

Building the Core Product List

An important consideration in identifying the products for inclusion in the core or reduced list[20] was that each item selected within each basic heading should deliver the minimum deviations from the full list for the whole group of economies. Initial analysis of household consumption products showed that it would be necessary to price about 30% of the 2005 products on the basis of a comparison of standard deviations of the (CPD-based) basic heading PPPs. Similar criteria were also applied to machinery and equipment items.

Combinatorial Approach for Household, and Machinery and Equipment Items

To demonstrate the approach to selecting the core lists, rice was chosen as it was one of the basic headings with the largest number of products in the 2005 ICP. From Table 3, one can see that rice has 19 individual products and the price matrix is fairly sparse, with only four products having 10 or more economies pricing them. The initial goal was to select about 30% of the total number of products for each basic heading to derive the core list, which meant that six products would represent the "rice" basic heading.

Table 3 also shows the coefficients of variation (CVs) of the CPD residuals by economy and by product in the "rice" basic heading, indicating how coherent the prices are across economies and products with CPD residuals less than 20%. The selection of products to be included in the core list could be based on a similarity measure, for example, CVs by products from Table 3 where products with lower CVs would be included. However, selecting individual products in this way may present some bias and would not allow for the effects of within-core group correlation, when individual products may contribute more if they were considered in a group. Hence, a "combinatorial" process was used whereby all possible combinations were computed, even though evaluating all possible combinations entailed intensive computations. The number of combinations (*k)* from a set of size *n* would be given by the following formula:

$$C_k^n = \binom{n}{k} = \frac{n!}{k!\,(n-k)!}$$

The use of the combinatorial approach is exhaustive. In the case of rice, a total of 27,132 combinations were simulated to derive the best combination that would include a core list of six products (30%) out of 19 products from the full list. The approach singled out products S = {10, 12, 13, 17, 18, 19} as being the best set for the Update with a standard deviation for S being 8.1% from a total of 48 quotes only. Table 4 shows the products selected by economy, for pricing under rice.[21]

Interestingly, even though 12 economies priced white rice #3 (Table 3), it was not part of the selection (Table 4). Its omission reflects the randomness of the selection process, which can be considered unbiased and depending purely on the contribution of the product to the rice basic heading PPP rather than on the number of economies pricing that product.

Size of the Core List

As mentioned, initial analysis showed that in determining the size of the core lists, it is necessary to price about 30% of the 2005 products within the household consumption sector. The 30% ratio of the core to the full list was estimated as the trade-off point between the returns starting to diminish as the number of products in the core list increases. As an illustration, Figure 1 shows the behavior of the standard deviation of the rice basic heading PPP (based on an analysis using the CPD method), depending on the number of items to be included in the core list. It shows that for rice with 19 products, there are diminishing returns after about 30% of products are included in the core list. Selecting one to three products does not produce an outcome with the same number of economies as the original 19 product basic heading, so those selections are not shown in the graph. This implies that the required binary matching and CPD transitivity occur only after a combination of at least four rice products is selected—although the deviation is relatively high, at about 11%, when only four products are included.

20 The final reduced list had about 43% of the total items from the full list.

21 Basic heading PPPs were normalized (divided) with respect to the regional geometric mean to remove the base-country effect.

Table 3. Average Prices of Rice Items, by Product and by Economy,[a] 2005 (in local currency units)

Item Code	Item Description	CV[b]	No. of Economies Pricing the Item	A	B	C	D	E	F	G
1101111011	Coarse #3	0.15	3	19.28			26.01			
11011110110	White rice #3	0.19	12	44.72	17.86	19.49		38.96		
11011110111	White rice #4	0.26	4	22.75		30.09				
11011110112	White rice #5	0.13	6			22.71				
11011110113	White rice #6	0.06	4			21.00				
11011110114	White rice #7	0.11	3			27.11				
11011110115	White rice $8	0.16	5							
11011110116	White rice #9	0.07	4							
11011110117	White rice #10	0.14	5							
11011110118	Premium rice #1	0.19	10	38.07					42.18	
11011110119	Premium rice #2	0.20	12							75.37
11011110120	Premium rice #3	0.10	4							
11011110121	Premium rice #4	0.12	13				36.46	27.54		36.66
1101111013	Coarse #2	0.33	3		25.97	11.70				
1101111014	Coarse #6	0.17	5			11.88			12.62	
1101111015	Coarse #5	0.18	3			12.91				
1101111017	Brown rice	0.29	5	22.67		10.69				52.05
1101111018	White rice #1	0.15	9			25.18			34.58	
1101111019	White rice #2	0.15	7		21.52	21.10				
CV of CPD[c] residuals by economy				0.21	0.35	0.19	0.08	0.04	0.08	0.32
Number of items priced by economy				6	3	11	2	2	3	3

a Actual prices submitted by economies for the 2005 International Comparison Program.
b Coefficients of variation.
c Country-product-dummy.

Table 4. Core List of Rice Items Priced, by Product and by Economy

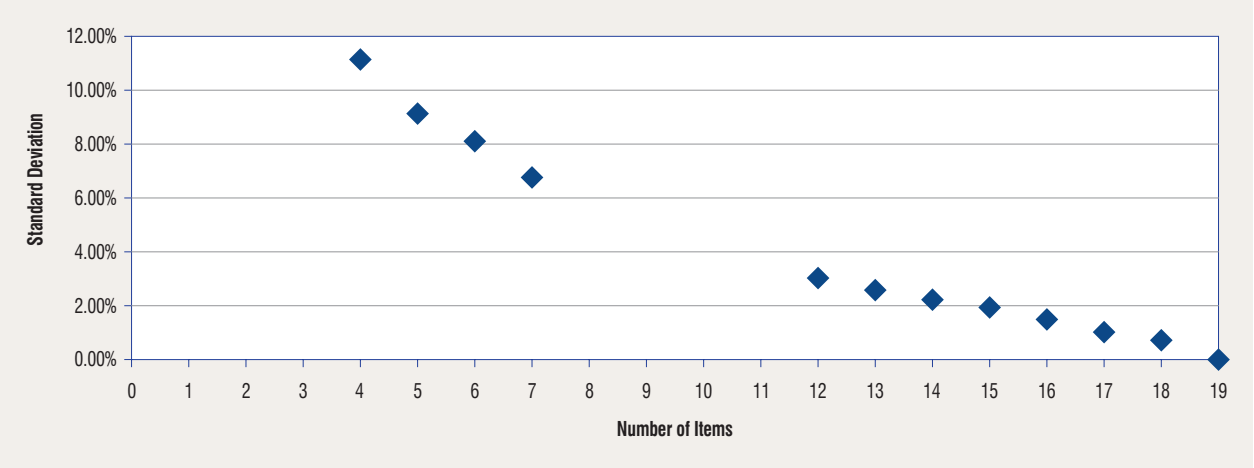
Item Code	Item Description	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
11011110118	Premium rice #1	X	X		X		X	X		X				X	X					X		
11011110120	Premium rice #3	X								X											X	X
11011110121	Premium rice #4	X		X		X	X	X	X				X		X		X	X	X	X		
1101111017	Brown rice	X	X									X							X		X	
1101111018	White rice #1	X			X					X		X		X		X		X			X	X
1101111019	White rice #2	X							X	X	X	X				X		X				

X - corresponds to product priced in the 2009 PPP Upate.

Table 3. Average Prices of Rice Items, by Product and by Economy,[a] 2005 (in local currency units)
(continued)

H	I	J	K	L	M	N	O	P	Q	R	S	T	U
					12.27								
26.92				48.05	30.45	38.28	21.28		38.90			34.36	23.67
				39.24		27.63							
				30.94		31.13				31.99			31.81
				28.84		29.00							
			57.44			30.67							
32.05			65.89			23.37			40.32				
	81.43	50.85	64.88			28.92							
	90.35	50.48	70.90			29.82					22.13		
29.00			75.46	25.61		49.65	27.79	39.54	48.60				
48.26	86.22		110.00		68.36	56.85	24.92		73.02	52.34	47.08	31.97	
	104.77					46.50	24.20						31.61
21.48		48.54	55.22	30.93	31.79	26.73			32.64		19.05	18.91	
									20.93				
					10.68	11.43					13.93		
					12.13	10.94							
	44.37					12.03							
	65.84					45.50	26.04	36.75		27.50		25.29	21.53
					27.11	25.83	23.49			21.16		31.10	
0.09	0.18	0.08	0.06	0.24	0.19	0.19	0.18	0	0.11	0.14	0.16	0.2	0.15
5	6	3	7	6	7	17	6	2	6	4	4	5	4

Figure 1. Rice Purchasing Power Parities' Standard Deviations Based on the Number of Items Included



The starting point in identifying the core list, therefore, was to target price collection for about 30% of the full list, applied to each basic heading. Apart from the 30% criterion, the core products selected within each basic heading should produce a deviation of less than 15% between the normalized basic heading parities based on the core list and the normalized basic heading parities based on the full 2005 list. The outcome was that it was necessary to include more than 30%, or all products for some basic headings in which only a few products were specified in 2005.

The number of core products per economy and per basic heading is shown in Table 5. Seventy-two of the 90

Table 5. Number of Items Priced by Basic Heading and by Economy, 2005 and 2009 [a]

Basic Heading Code	Basic Heading Description	2005	2009	Ratio (2009/2005)	BAN	BHU	BRU	CAM	PRC
1101111	Rice	19	6	0.32	6	2	1	4	2
1101112	Other cereals, flour, and other cereal products	13	4	0.31	3	2	3	2	3
1101113	Bread	6	2	0.33	2	2	2	1	1
1101114	Other bakery products	10	3	0.30	3	3	3	3	2
1101115	Pasta products	5	3	0.60	3	2	3	3	3
1101121	Beef and veal	7	3	0.43	3	1	2	2	2
1101122	Pork	6	2	0.33	0	2	0	2	2
1101123	Lamb, mutton, and goat	5	3	0.60	1	2	0	0	3
1101124	Poultry	9	3	0.33	2	1	2	2	3
1101125	Other meats and meat preparations	7	4	0.57	2	3	2	3	4
1101131	Fresh, chilled or frozen fish and seafood	15	6	0.40	3	1	4	4	4
1101132	Preserved or processed fish and seafood	7	3	0.43	1	3	3	3	3
1101141	Fresh milk	4	2	0.50	2	2	1	1	2
1101142	Preserved milk and other milk products	8	3	0.38	3	2	2	2	3
1101143	Cheese	4	2	0.50	1	1	2	2	2
1101144	Eggs and egg-based products	4	2	0.50	1	2	1	1	2
1101151	Butter and margarine	3	2	0.67	1	1	2	2	0
1101153	Other edible oils and fats	10	3	0.30	2	1	3	2	3
1101161	Fresh or chilled fruit	10	3	0.30	3	3	3	3	3
1101162	Frozen, preserved or processed fruit, and fruit-based products	3	2	0.67	1	0	2	1	2
1101171	Fresh or chilled vegetables other than potatoes	11	3	0.27	3	3	3	3	3
1101172	Fresh or chilled potatoes	3	2	0.67	2	2	2	2	1
1101173	Frozen, preserved or processed vegetables, and vegetable-based products	6	4	0.67	3	4	4	2	4
1101181	Sugar	3	2	0.67	1	1	2	2	2
1101182	Jams, marmalades, and honey	3	2	0.67	2	2	2	2	2
1101183	Confectionery, chocolate, and ice cream	5	3	0.60	2	2	3	2	3
1101191	Food products n.e.c.	10	3	0.30	3	3	3	2	3
1101211	Coffee, tea, and cocoa	8	2	0.25	2	1	2	1	1
1101221	Mineral waters, soft drinks, fruit, and vegetable juices	7	2	0.29	2	2	1	2	2
1102111	Spirits	2	2	1.00	0	2	0	2	1
1102121	Wine	5	3	0.60	0	1	0	2	3
1102131	Beer	4	2	0.50	0	2	0	2	2
1102211	Tobacco	6	2	0.33	2	2	1	2	2

continued on next page

household basic headings (e.g., pasta and fresh, chilled, or frozen fish and seafood) have core products that account for more than 30% of the 2005 full list, while 17 basic headings with one, two, or three products, had 100% coverage. All six educational products were also included, as this basic heading has a relatively high weight and also exhibited a higher degree of variability compared with other basic headings of similar size. Hence, the final household list turned out to be about 43% of the 2005 household list, incorporating 279 products, with economies pricing between 165 products (Bhutan) and 243 products (Viet Nam) in 2009.

Table 5. Number of Items Priced by Basic Heading and by Economy, 2005 and 2009[a]
(continued)

FIJ	HKG	IND	INO	LAO	MAL	MLD	MON	NEP	PAK	PHI	SIN	SRI	TAP	THA	VIE
1	2	2	2	1	2	1	2	2	1	3	2	3	3	2	2
4	3	2	3	2	3	3	3	3	3	3	3	3	2	3	3
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1	3	3	2	3	3	2	3	2	3	3	2	3	3	3	3
3	3	2	3	3	3	2	3	3	3	3	3	3	3	3	3
2	1	1	3	2	2	0	2	1	3	2	1	2	1	2	3
2	2	2	2	2	2	0	2	1	0	2	2	2	2	2	2
3	2	3	3	0	3	0	3	3	3	1	1	1	3	0	0
2	3	1	3	1	2	1	2	1	3	3	2	2	2	2	3
2	2	2	4	2	3	1	3	0	2	2	2	2	2	2	3
2	5	6	6	2	6	2	0	1	6	5	2	5	5	4	5
2	2	3	3	1	3	2	2	3	3	3	3	3	3	3	3
1	1	2	1	1	1	1	2	2	2	1	1	2	1	1	1
2	3	3	3	2	3	2	2	3	3	3	3	1	3	3	3
0	2	1	2	2	2	1	2	2	2	2	2	1	2	2	2
2	2	1	2	1	2	1	2	1	2	2	1	2	2	2	2
2	2	1	2	1	2	2	2	1	2	2	2	2	2	2	2
2	2	3	3	1	3	3	3	2	3	2	3	2	3	3	2
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
1	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2
1	3	3	4	1	4	2	4	2	4	4	4	4	4	4	4
0	2	1	2	2	2	2	1	1	2	2	2	2	2	2	2
2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2
3	3	2	3	1	3	3	2	2	3	2	2	2	3	3	3
3	2	3	2	2	3	3	3	3	3	2	3	3	2	3	3
2	2	1	1	1	2	2	2	1	2	2	2	2	2	2	2
2	1	2	2	2	2	2	2	2	2	2	2	2	1	2	2
2	1	1	2	2	1	0	2	2	0	2	1	2	1	2	2
1	2	1	2	1	1	0	1	1	0	3	1	2	3	2	3
2	2	1	2	2	1	0	2	0	0	2	2	2	2	2	2
1	2	2	2	2	2	1	2	2	1	2	2	2	2	2	2

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Table 5. continuation

Basic Heading Code	Basic Heading Description	2005	2009	Ratio (2009/2005)	BAN	BHU	BRU	CAM	PRC
1103111	Clothing materials, other articles of clothing, and clothing accessories	5	3	0.60	3	3	2	3	3
1103121	Garments	54	17	0.31	14	15	10	14	8
1103141	Cleaning, repair, and hire of clothing	2	2	1.00	2	2	2	2	2
1103211	Shoes and other footwear	8	2	0.25	2	2	2	2	2
1103221	Repair and hire of footwear	2	2	1.00	2	2	0	2	2
1104311	Maintenance and repair of the dwelling	6	2	0.33	2	2	2	2	2
1104411	Water supply	1	1	1.00	1	1	0	1	1
1104421	Miscellaneous services relating to the dwelling	1	1	1.00	1	0	1	1	1
1104511	Electricity	1	1	1.00	1	1	1	1	1
1104521	Gas	2	2	1.00	2	1	1	1	2
1104531	Other fuels	3	3	1.00	2	2	0	2	0
1105111	Furniture and furnishings	15	5	0.33	5	3	3	4	2
1105121	Carpets and other floor coverings	3	3	1.00	1	2	3	2	0
1105211	Household textiles	7	2	0.29	2	2	1	2	1
1105311	Major household appliances whether electric or not	13	4	0.31	3	1	3	3	4
1105321	Small electric household appliances	10	3	0.30	3	3	3	3	3
1105331	Repair of household appliances	3	3	1.00	3	1	3	3	3
1105411	Glassware, tableware, and household utensils	8	2	0.25	2	2	2	2	1
1105521	Small tools and miscellaneous accessories	8	2	0.25	2	2	2	2	2
1105611	Non-durable household goods	13	4	0.31	4	4	3	3	4
1105621	Domestic services	2	1	0.50	1	1	1	1	1
1106111	Pharmaceutical products	35	11	0.31	8	4	8	7	10
1106121	Other medical products	8	4	0.50	4	2	2	4	4
1106131	Therapeutical appliances and equipment	10	3	0.30	3	0	2	3	3
1106211	Medical Services	6	2	0.33	2	0	2	2	1
1106221	Services of dentists	4	2	0.50	2	0	1	1	2
1106231	Paramedical services	7	3	0.43	3	0	2	3	1
1107111	Motor cars	5	3	0.60	2	1	1	1	2
1107131	Bicycles	1	1	1.00	1	0	1	1	1
1107221	Fuels and lubricants for personal transport equipment	8	8	1.00	4	3	5	6	7
1107231	Maintenance and repair of personal transport equipment	12	4	0.33	4	2	4	4	4
1107311	Passenger transport by railway	5	3	0.60	2	0	0	0	3
1107321	Passenger transport by road	6	2	0.33	2	1	2	1	2
1107331	Passenger transport by air	4	2	0.50	2	1	2	2	2
1108111	Postal services	2	2	1.00	2	2	2	2	2
1108211	Telephone and telefax equipment	5	2	0.40	2	2	1	2	1
1108311	Telephone and telefax services	7	4	0.57	4	3	2	2	3
1109111	Audio-visual, photographic, and information processing equipment	11	3	0.27	3	3	3	3	2
1109141	Recording media	9	3	0.33	2	2	2	3	3
1109151	Repair of audio-visual, photographic and information processing equipment	2	2	1.00	2	0	2	2	0
1109211	Major durables for outdoor and indoor recreation	4	2	0.50	1	0	2	1	2
1109311	Other recreational items and equipment	10	3	0.30	2	1	3	2	1

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Table 5. continuation

FIJ	HKG	IND	INO	LAO	MAL	MLD	MON	NEP	PAK	PHI	SIN	SRI	TAP	THA	VIE
3	3	2	3	3	3	2	3	3	3	2	2	3	3	3	3
14	17	16	17	8	17	11	17	16	17	15	15	15	17	15	15
0	2	2	2	1	2	0	1	2	2	2	2	2	2	2	2
2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2
2	2	2	2	1	2	0	2	2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2
1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1
0	0	1	1	0	0	1	1	1	1	0	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	2	2	1	1	2	1	1	1	2	1	1	1	2	1	1
2	1	3	2	1	1	1	2	2	3	2	1	2	0	1	3
2	3	4	5	4	5	3	5	5	5	5	4	5	4	5	5
1	2	3	2	2	3	1	3	2	3	2	1	0	2	2	3
1	2	2	1	2	2	2	1	2	2	2	2	1	2	2	2
3	3	4	3	4	4	4	3	3	4	4	1	4	3	4	4
3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3
3	2	3	3	3	3	2	2	3	3	3	3	3	3	3	3
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4	4	4	4	3	4	2	3	4	4	4	4	4	4	4	4
0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1
11	7	9	10	4	11	7	8	11	11	7	8	9	8	10	11
4	4	4	4	2	4	4	3	4	4	4	4	4	4	3	3
0	3	3	3	1	3	3	3	3	3	3	3	3	3	3	3
2	2	2	1	0	2	2	1	2	2	2	2	2	2	2	2
2	2	2	1	0	2	2	1	2	2	2	2	2	2	2	1
2	3	3	3	0	3	2	3	3	3	3	3	3	3	3	3
0	2	3	3	2	2	0	0	3	3	2	2	3	2	2	2
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	4	7	7	7	3	2	5	6	6	7	5	7	5	4	5
4	4	3	4	4	4	3	4	3	4	4	4	4	4	4	4
0	1	3	2	0	3	0	3	0	2	3	1	1	3	2	2
1	2	1	2	1	2	0	2	1	2	2	1	2	2	2	2
1	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2
1	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2
1	2	2	2	2	2	1	2	2	2	2	1	2	1	2	2
3	1	0	4	3	3	3	3	3	3	2	2	2	4	3	3
3	3	3	3	3	3	2	3	3	3	3	2	3	3	3	3
3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3
2	1	2	2	2	2	2	2	2	2	2	1	1	1	2	2
2	2	2	2	2	2	0	2	1	2	2	1	2	2	2	2
3	3	3	3	2	3	3	2	2	3	3	3	2	3	3	3

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Table 5. continuation

Basic Heading Code	Basic Heading Description	2005	2009	Ratio (2009/2005)	BAN	BHU	BRU	CAM	PRC
1109331	Gardens and pets	5	3	0.60	1	0	2	2	3
1109351	Veterinary and other services for pets	1	1	1.00	0	0	1	0	1
1109411	Recreational and sporting services	3	3	1.00	1	0	3	3	2
1109421	Cultural services	4	2	0.50	2	2	2	2	2
1109511	Newspapers, books, and stationery	8	2	0.25	2	1	1	2	2
1109611	Package holidays	4	1	0.25	1	0	1	0	1
1110111	Education	6	6	1.00	6	2	5	6	6
1111111	Catering services	17	5	0.29	4	2	3	4	4
1111211	Accommodation services	4	3	0.75	3	2	2	3	3
1112111	Hairdressing salons and personal grooming establishments	6	4	0.67	4	4	3	4	4
1112121	Appliances, articles and products for personal care	16	5	0.31	5	5	5	5	2
1112311	Jewellery, clocks, and watches	6	2	0.33	2	1	1	2	1
1112321	Other personal effects	4	2	0.50	2	2	2	2	2
1112621	Other financial services n.e.c.	5	2	0.40	1	1	2	1	2
1112711	Other services n.e.c.	2	1	0.50	1	1	1	1	1
Total number of items priced		**647**	**269**	**0.42**	**215**	**165**	**192**	**214**	**215**
Total Number of basic headings to priced		90	90		85	76	81	86	86

a 2005 refers to the full list items in International Comparison Program and 2009 refers to the core list of items in the 2009 Purchasing Power Parity Update.

Adjusting from the Core to the Full List

To obtain a meaningful comparison with the 2005 results, coefficients (or adjustment factors) at the basic heading levels were calculated for the core list PPPs. These coefficients are also the adjustment factors used to adjust the core list PPPs to the full list PPP to ensure consistency with the full list PPPs for each basic heading. In this sense, the Update would be using the maximum available information from the 2005 ICP. For example, Table 6 shows the adjustment factors from the core to the full list by economy for the basic heading "rice." Similar ratios (adjustment factors) were computed across all household basic headings for all economies. The same core to full list adjustment was also implemented for the "machinery and equipment" basic heading in lieu of the unavailable information to satisfy PPP adjustments using real exchange rates adjusted for taxes, subsidies, and transportation, and installation costs. No adjustment was necessary (or the adjustment factor was equal to one) for balance of exports and imports and for changes in inventories and net acquisitions of valuables, since they use a reference PPP that is equivalent to the 2009 average exchange rate of the local currency versus the

Table 6. Core to Full List Adjustment Factors for Rice, by Economy[a]

Economy	BAN	BHU	BRU	CAM	PRC	FIJ	HKG	IND	INO
Ratios	1.08	1.06	0.97	1.1	1.05	1.14	1.03	1.12	0.87

a The 2005 International Comparison Program data were used to estimate adjustment factors or the ratios of the Purchasing Power Parity (PPP) of the core and the full list by each major expenditure category. PPP ratios were derived for each basic heading and were used to adjust the the final 2009 PPP core estimates to the full list PPP.

Table 5. continuation

FIJ	HKG	IND	INO	LAO	MAL	MLD	MON	NEP	PAK	PHI	SIN	SRI	TAP	THA	VIE
1	3	3	0	2	3	2	3	1	3	3	3	3	3	3	3
0	1	1	0	0	1	0	1	1	1	1	1	1	1	1	0
2	3	3	3	2	3	1	3	1	2	3	3	2	3	3	3
2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
0	1	1	1	0	1	0	0	0	1	1	1	1	1	1	1
2	6	6	6	2	6	4	6	6	6	6	5	6	5	6	6
3	4	5	5	4	5	2	5	5	5	4	3	5	3	4	4
2	2	3	3	3	3	1	3	3	3	3	2	2	2	1	3
4	4	4	4	3	4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5
2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1	2	2	2	1	1	1	2	2	2	2	1	2	2	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
192	**225**	**233**	**245**	**175**	**245**	**166**	**226**	**217**	**244**	**239**	**211**	**232**	**235**	**233**	**243**
80	89	89	88	82	89	75	87	86	85	89	90	89	89	89	88

numeraire currency. A different procedure was used to compute the PPPs for construction, described in detail later in this chapter.

Table 7 shows the precision for each category of household basic headings aggregated to a higher level by economy. The table shows that the overall precision for GDP is 1.4% while that for household final consumption expenditure is 1.6% (measured as the CV). Economies exhibiting high deviations for household final consumption expenditure include Cambodia (−3.3%) and Pakistan (+3.3%) while most economies are within 1% boundaries. These deviations quoted are for unadjusted parities. Once they are adjusted using the coefficients (adjustment factor) for each basic heading, the deviations become zero for all economies. The unadjusted deviations show what the overall results would be if the only product list available was the core product list, and the 2005 results were not available as a benchmark. As can be seen, the overall precision would still be well acceptable, given that the precision of the ICP exercise is generally considered to be about ±5% for real expenditures on GDP.

Table 6. Core to Full List Adjustment Factors for Rice, by Economy[a]
(continued)

LAO	MAL	MLD	MON	NEP	PAK	PHI	SIN	SRI	THA	TAP	VIE
0.93	1.07	0.94	1.01	0.88	0.9	1.02	1.14	0.93	0.95	1.01	0.92

Table 7. Coefficients and Core to Full List Adjustment Factors by Major Expenditure Aggregates, Categories, Groups, and by Economy[a]

EXPENDITURE CATEGORY/ECONOMY	CV	BAN	BHU	BRU	CAM	PRC	FIJ	HKG
GROSS DOMESTIC PRODUCT	**0.014**	**0.994**	**0.994**	**1.011**	**1.022**	**0.991**	**1.019**	**1.007**
Actual Final Consumption	**0.017**	**0.990**	**0.994**	**1.011**	**1.029**	**0.992**	**1.020**	**1.004**
Household Final Consumption Expenditure	**0.016**	**0.988**	**0.997**	**1.002**	**1.033**	**0.996**	**1.017**	**0.999**
Food and Nonalcoholic Beverages	0.024	1.022	1.009	0.994	1.051	0.964	1.050	1.012
Bread and Cereals	0.047	1.035	1.020	0.989	1.101	1.037	1.062	1.028
Meat and Fish	0.036	1.000	1.055	0.978	0.992	0.936	0.976	1.039
Fruits and Vegetables	0.060	1.040	0.990	1.019	1.065	0.906	1.126	1.000
Other Food and Nonalcoholic Beverages	0.042	0.992	0.993	0.986	1.034	0.996	1.053	0.957
Clothing and Footwear: of which	0.037	0.977	0.974	0.938	1.012	1.019	1.012	1.011
Clothing	0.034	0.983	0.988	0.920	1.003	1.039	0.987	1.005
Housing, Water, Electricity, Gas, and Other Fuels	0.015	0.982	1.002	0.995	1.029	1.029	1.001	0.995
Health and Education	0.033	0.970	0.980	1.056	1.027	0.974	1.030	1.014
Health	0.040	0.919	0.984	1.043	1.053	0.986	1.033	1.001
Education	0.038	1.009	0.975	1.058	0.999	0.959	1.029	1.024
Transportation and Communication: of which	0.057	0.916	0.972	1.019	1.042	1.019	0.931	1.006
Transportation	0.052	0.892	0.997	0.993	1.028	1.017	0.935	1.046
Recreation and Culture	0.053	0.966	0.998	1.025	0.981	1.038	1.062	0.948
Restaurants and Hotels	0.067	0.941	0.999	1.030	0.989	0.960	1.054	0.983
Other Consumption Expenditure Items	0.028	0.981	1.000	0.989	1.007	0.995	1.030	1.020
Individual Consumption Expenditure By General Government: of which	**0.048**	**1.017**	**0.975**	**1.076**	**1.003**	**0.956**	**1.055**	**1.043**
Health	0.050	1.006	0.973	1.061	1.008	0.932	1.039	1.059
Education	0.063	1.024	0.964	1.095	1.000	0.926	1.049	1.063
Collective Consumption Expenditure By General Government	**0.054**	**1.016**	**0.961**	**1.069**	**1.005**	**0.937**	**1.039**	**1.072**
Gross Fixed Capital Formation: of which	**0.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**
Machinery and Equipment	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Construction	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Change in Inventories and Net Acquisitions of Valuables	**0.010**	**0.999**	**1.002**	**0.998**	**1.026**	**0.997**	**1.021**	**1.004**
Balance of Exports and Imports	**0.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**
Household Final Consumption Expenditure	**0.016**	**0.988**	**0.997**	**1.002**	**1.033**	**0.996**	**1.017**	**0.999**
Government Final Consumption Expenditure	**0.051**	**1.016**	**0.968**	**1.072**	**1.005**	**0.944**	**1.046**	**1.060**
Actual Final Consumption	**0.017**	**0.990**	**0.994**	**1.011**	**1.029**	**0.992**	**1.020**	**1.004**
All Goods	**0.016**	**0.999**	**1.001**	**0.997**	**1.035**	**0.992**	**1.035**	**1.007**
Nondurables	0.019	1.005	1.012	0.998	1.042	0.987	1.040	1.005
Semi-Durables	0.022	0.995	0.950	0.972	0.998	0.991	1.024	0.999
Durables	0.033	0.951	1.032	1.002	1.005	1.010	1.016	1.012
Services	0.027	0.969	0.984	1.027	1.024	0.991	0.999	1.003

a The 2005 International Comparison Program data were used to estimate adjustment factors or the ratios of the Purchasing Power Parity (PPP) of the core and the full list by each major expenditure category. PPP ratios were derived for each basic heading and were used to adjust the the final 2009 PPP core estimates to the full list PPP.

Table 7. Coefficients and Core to Full List Adjustment Factors by Major Expenditure Aggregates, Categories, Groups, and by Economy[a] *(continued)*

IND	INO	LAO	MAL	MLD	MON	NEP	PAK	PHI	SIN	SRI	TAP	THA	VIE
1.025	**0.975**	**0.986**	**1.006**	**1.007**	**0.994**	**0.990**	**0.974**	**0.994**	**1.001**	**1.013**	**1.001**	**0.983**	**0.987**
1.030	**0.975**	**0.996**	**1.005**	**1.002**	**0.993**	**0.990**	**0.968**	**0.995**	**0.992**	**1.014**	**0.997**	**0.980**	**0.991**
1.028	**0.982**	**1.003**	**1.002**	**0.993**	**0.998**	**0.990**	**0.967**	**0.996**	**0.988**	**1.011**	**0.993**	**0.983**	**1.001**
1.007	0.998	1.013	0.990	0.972	1.006	0.994	0.951	0.983	1.022	1.001	0.985	0.970	0.988
1.054	0.930	0.937	1.035	1.010	1.049	0.955	0.959	0.997	1.038	0.944	0.991	0.952	0.923
0.955	1.032	1.031	0.953	0.919	0.986	1.040	1.016	0.996	1.049	1.010	1.042	0.997	1.032
1.002	1.000	1.095	0.967	0.928	1.061	1.024	0.864	1.010	0.989	0.968	0.960	0.989	0.970
0.999	1.036	1.063	1.003	1.016	0.959	0.993	0.959	0.908	0.990	1.080	0.941	0.951	1.032
1.055	0.957	0.958	0.969	0.997	0.935	1.037	0.999	0.993	0.994	0.984	1.039	1.004	1.006
1.040	0.934	0.992	0.958	0.995	0.974	1.016	1.010	0.994	1.024	0.990	1.031	1.017	1.000
1.000	0.985	0.993	1.009	0.980	1.022	0.991	0.977	0.998	1.000	1.015	0.998	0.999	1.023
1.037	0.952	0.977	1.048	1.043	0.998	0.952	0.965	1.016	1.029	1.014	1.019	0.965	0.974
1.035	0.974	1.009	1.068	1.026	1.012	0.929	0.946	1.057	1.041	0.978	1.011	0.969	1.000
1.040	0.923	0.948	1.032	1.051	0.977	0.993	0.989	0.984	1.022	1.054	1.033	0.961	0.944
1.095	0.972	1.038	0.968	1.056	0.962	0.981	0.957	0.946	0.913	1.064	1.011	0.989	1.024
1.099	0.967	1.026	0.975	1.068	0.990	0.953	0.916	0.977	0.938	1.052	1.015	0.999	1.049
1.091	0.933	1.000	0.972	0.952	0.949	1.093	1.097	1.058	0.930	0.977	0.982	0.992	1.012
1.025	1.091	0.924	1.019	1.148	1.127	0.923	0.978	1.081	1.018	0.925	0.919	0.955	0.892
1.036	0.909	0.977	1.021	0.994	0.975	1.018	0.965	1.009	1.007	1.048	1.004	0.998	1.030
1.051	**0.893**	**0.940**	**1.041**	**1.056**	**0.965**	**0.986**	**0.980**	**0.977**	**1.035**	**1.047**	**1.038**	**0.951**	**0.922**
1.049	0.900	0.939	1.044	1.054	0.979	0.974	0.985	0.988	1.069	1.047	1.045	0.946	0.936
1.071	0.867	0.924	1.048	1.071	0.963	0.984	0.973	0.967	1.038	1.071	1.069	0.948	0.896
1.058	**0.884**	**0.935**	**1.039**	**1.061**	**0.971**	**0.988**	**0.974**	**0.972**	**1.030**	**1.056**	**1.049**	**0.957**	**0.908**
1.000	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**
1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1.015	**0.982**	**1.002**	**1.000**	**0.992**	**0.996**	**0.993**	**0.977**	**0.997**	**0.998**	**1.001**	**1.000**	**0.993**	**1.004**
1.000	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**
1.028	**0.982**	**1.003**	**1.002**	**0.993**	**0.998**	**0.990**	**0.967**	**0.996**	**0.988**	**1.011**	**0.993**	**0.983**	**1.001**
1.055	**0.887**	**0.938**	**1.040**	**1.059**	**0.968**	**0.987**	**0.976**	**0.974**	**1.032**	**1.052**	**1.045**	**0.954**	**0.915**
1.030	**0.975**	**0.996**	**1.005**	**1.002**	**0.993**	**0.990**	**0.968**	**0.995**	**0.992**	**1.014**	**0.997**	**0.980**	**0.991**
1.026	**0.971**	**1.004**	**1.000**	**0.985**	**0.995**	**0.994**	**0.969**	**0.997**	**0.990**	**1.003**	**1.001**	**0.989**	**1.009**
1.019	0.976	1.009	0.998	0.981	1.002	0.986	0.950	0.992	1.011	1.010	0.994	0.982	1.006
1.034	0.980	0.997	0.994	0.985	0.961	1.029	1.015	1.014	0.990	0.989	1.024	1.014	0.998
1.054	0.938	0.987	1.008	0.993	1.007	1.025	1.072	0.997	0.954	0.981	0.988	0.971	1.034
1.043	0.981	0.978	1.010	1.022	0.993	0.984	0.963	0.990	0.991	1.037	0.995	0.971	0.970

Adjusting Capital City Prices to National Levels

Unlike machinery and equipment prices, which were collected only in capital cities for both the 2005 ICP and the Update, it was necessary to adjust the 2009 household prices collected from the capital city to the national level. The following two options were explored:

(i) computing the adjustment factors from national CPIs where the CPI data allows it, i.e., (intra-economy adjustments to obtain national average price); or
(ii) computing adjustment factors from the economies' price submissions for the 2005 ICP.

For economies that are geographically small, homogenous, and considered as city-states, intra-economy adjustment was not necessary as price collection for the Update was similar in coverage to that of the 2005 ICP.

Grouping Economies

To ensure the greatest possible consistency in prices collected in the Update with those from the 2005 ICP, the capital city prices had to be adjusted to the national level. For this process, the 21 participating economies were grouped into three clusters:

(i) **Group 1** comprised geographically large and diverse economies, where special subnational studies were explored and where sufficient information was available for estimating adjustment factors from the CPIs (described in the ensuing section). This group consisted of the PRC, India, Indonesia, Malaysia, the Philippines, Thailand, and Viet Nam.
(ii) **Group 2** comprised economies whose current statistical infrastructure or capacity did not support the method suggested for group 1. Hence, adjustments were to be based on the 2005 ICP relationship of the capital city to national prices. Nine economies belonged to this group: Bangladesh, Bhutan, Cambodia, Fiji, the Lao PDR, Mongolia, Nepal, Pakistan, and Sri Lanka.
(iii) **Group 3** comprised geographically small and homogenous economies where no adjustments were needed: Brunei Darussalam; Hong Kong, China; the Maldives; Singapore; and Taipei,China.

Price Adjustment Process

Price data collected for households were adjusted to the national level for the 16 economies included in groups 1 and 2. With the exception of Brunei Darussalam and the Maldives, the economies in group 3 were basically city-states and so the capital city and the total economy were one and the same. For the other economies, however, price adjustments (for 2009) to obtain national average prices needed to be done at the product, basic heading, or group level, depending on available information. Evidence has shown that the price levels in major cities are not the same as those in the rest of the economy, even if the changes in prices in the capital city are highly correlated with those in other parts of the economy. To further complicate the issue, the relationship between capital city prices and those in other parts of an economy vary depending on the basic heading being considered. For example, rents and locally produced food products tend to be lower outside the capital city, but fuel and processed food prices are often higher. The implication is that the calculation of national average prices cannot be based on a common adjustment factor across all basic headings. The two options mentioned earlier, using adjustments based either on data mining from the national 2009 CPI or on the price data submitted for the 2005 ICP, were explored.

Data mining from the CPI. The national CPI database was identified as a potential data source that could help in the calculation of adjustments to the capital city prices to bring them to the national annual average prices. The CPI systems in the economies in group 1 were expected to include a sufficiently large number of products, covering all geographic locations in the economy, making it possible to use the relationships between capital city prices and those collected in the other (noncapital city) locations to adjust the capital city prices to annual national average prices. The critical elements in this process were

(i) determining whether each economy's CPI had common specifications across regions within the economy (or, if they varied, to what extent they did), for 2009; and
(ii) evaluating the extent of overlap in product specifications between the regions in each economy (at the minimum between capital city and national) so that the CPD method could be used to estimate PPPs at the commodity, basic heading,

or major group level. Identical products between regions in the economy would be determined and would form the basis for calculating the capital city and national level PPPs.

For economies with sufficient overlap in CPI product specifications between the capital city and other locations, the following procedures were proposed:

(i) Establish product overlap in the CPI database.
(ii) Classify products into corresponding class, or basic heading, or commodity level or at that level where binaries can be established across regions or states or between capital city and national level.
(iii) Calculate corresponding first level unweighted PPPs.
(iv) Apply the same CPI weights of major aggregates (class or major group level) by region, state, or capital city and the total for the national level, and compute the higher level (usually major CPI groups) weighted PPPs by region, state, capital city, and national level.
(v) From the estimates in item (iv), calculate the capital city and national level PPP ratios.
(vi) Apply the ratios derived in (v) to the corresponding 2009 capital city average prices at product, class, or group level.

To illustrate the procedures described above, assume an adjustment has to be made on the price of product A collected for the Update. Also, assume that exactly the same product A is found in the CPI. If the national average price in the CPI for product A was 45 currency units in 2009 and the average price for product A in the capital city was 50 currency units, then the capital city average price for product A collected for the Update would be multiplied by 0.90 (i.e., 45/50) to adjust it to the national average price level. The assumption underlying this process is that the price relativities between the capital city and other regions in the economy in the CPI reflect the prices that would have been collected in the Update if price collection had included all the noncapital city locations that were surveyed in the 2005 ICP. If the CPI data only allowed group or class level ratios to be established, then the adjustment factor (or ratios) would be applied to the corresponding 2009 group or class level PPP for the capital city. The main advantage of this approach is that any changes in the price structure within an economy between 2005 and 2009 would be taken into account rather than assuming that the 2005 relationships between the capital city and national price levels still held. This could be particularly important for products that are subject to large price variations over time and between regions, such as many food products and fuels.

Using 2005 ICP price information. A simpler process was proposed for those economies in which the CPI data were not available at a sufficiently detailed level for locations outside the capital city to enable the more detailed procedure (described above) to be used. It involved calculating the relationship between the average price in 2005 for each Update product in the capital city, comparing it with the national average price used in the 2005 ICP, and then adjusting the 2009 price for that product in the capital city using this ratio. In this case, adjustments would be made at the product level (and not the group or class level) since ICP product specifications are uniform across an economy (unlike in the CPI). An example would be a product having a national average price of 68 currency units in the 2005 ICP, while the average price for that product in the capital city was 80 currency units in the 2005 ICP. In this case, the 2009 price for the capital city would be multiplied by 0.85 (i.e., 68/80) to adjust it to a national average price. This procedure would be used for economies in group 2. In cases where a product selected for pricing in the capital city for the Update was not priced in the capital city in 2005, an imputation using prices from outside the capital city would be made before establishing the ratios. The limitation of using the 2005 relationships between the prices from the capital city and the national average prices for the economy as a whole to adjust the prices collected for the Update was that it assumed that these relationships did not change between 2005 and 2009.

The adjustment factors eventually used to adjust capital city prices to national levels in the Update were those derived from the data submitted for the 2005 ICP. This option was implemented for the following reasons: (i) in the course of exploring the CPI data, it was found that not many economies could provide the necessary price data (by subregion, product, and the subregional weights) for 2009; and (ii) for the few that could provide the data, the reference years differed. To maintain consistency in the reference years across all economies and in order that adjustments factors were not influenced by global or external factors (such as rising fuel and food prices) in selected economies, the 2005 ICP price data were used

to derive the capital city to national prices at the product level. In deriving the adjustment factors, the 2005 ICP data were taken as a given.

Calculating PPP for Construction

The update for construction was also treated as an extension of the main 2005 benchmark. Since prices for only 10 basic input items were collected for the Update, adjustment factors based on the 2005 ICP prices were used. The adjustment factors were obtained on the basis of several assumptions.

Each construction basic heading is determined by a combination of materials, rental of equipment, and labor cost factors. Using regression in logs, the process can be expressed as follows:

$$PPP_j^i = C^j * P_{mat}^i + C_{eqp}^j * P_{eqp}^i + C_{lab}^j * P_{lab}^i + c$$

where C_k and P_k are the regression coefficients and component PPPs, respectively, for construction *basic heading j*; *k* is the component (material, equipment, and labor). Materials, labor, and equipment cost factors are determined by a combination of the respective individual basic components via the CPD procedure (regression) for each construction basic heading:

$$y_{nc} = 1n\ p_{nc} = \alpha_1 D_1 + \alpha_2 D_2 + ... + \alpha_c D_c + \eta_1 D_1^* + \eta_2 D_2^* + ... + \eta_N D_N^* + u_{nC}$$

where D_c $(c=1,2,...,C)$ *and* D_n* are country and commodity dummy variables, respectively.

Table 8 shows the regression results.

PPPs for each of the three basic headings in construction—civil engineering works, residential buildings, and nonresidential buildings—were calculated through this shortcut method for 2005, on the basis of all the 34 construction components and basic input items, and the 10 basic input items identified for the Update. This procedure provided the adjustment coefficients to go from the 10 basic input items to the actual 2005 construction PPPs. These coefficient factors were used to adjust the construction PPPs on the basis of 10 basic input items in the Update. The fit of the model, that is, the relationship between the 2005 actual PLI for construction versus the PLI derived from using the shortcut method (i.e., without the adjustment), is shown in Figure 2. Note that the adjustment would place individual estimates on the regression line. One can think of the adjustment as a correction due to variations across nations in tax policies, various administrative fees, and other expenses. In this sense the adjustment parallels that in household consumption categories.

Aggregation Methods

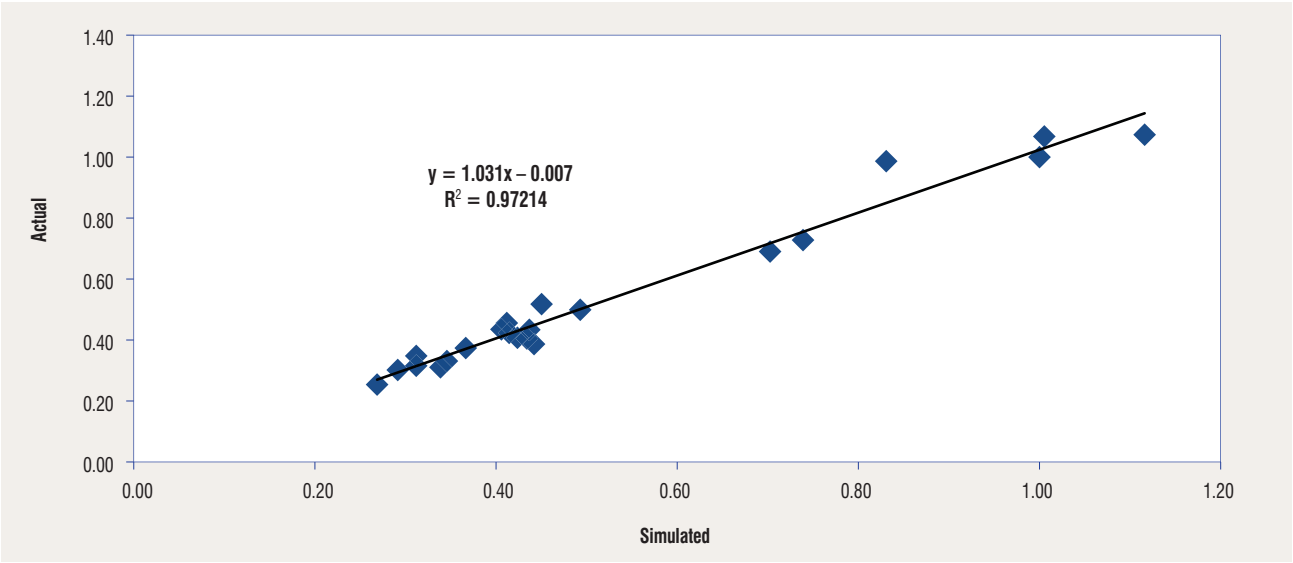
As is the case with price indexes in general, each index formula (or method) has its advantages and disadvantages. The selection of one method over another is based partly on the requirements of the analysis being undertaken.

Several alternative methods are available to estimate PPPs at the basic heading level (elementary aggregation) and to aggregate to levels above the basic heading (higher level aggregations). The two most commonly

Table 8. Regression Results for Construction, by Basic Heading, 2005

Basic Heading	Elasticity (%)			Standard Error (%)			R^2
	Materials	Equipment	Labor	Materials	Equipment	Labor	
Civil engineering works	48.4	11.2	27.5	7.5	2.8	1.4	0.971
Residential buildings	57.6	4.1	37.3	7.3	2.8	1.4	0.975
Nonresidential buildings	55.1	4.2	38.7	7.1	2.7	1.4	0.978
Total Construction	51.7	6.9	34.4	7.2	2.7	1.4	

Figure 2. Price Level Indexes for Construction, Actual vs. Simulated, 2005



used methods of calculating PPPs at the basic heading level are the CPD method (in two versions, CPD and country-product-representativity dummy [CPRD], with consideration of representative products) and some versions of the EKS[22] method or the Jevons method, which uses geometric means for calculating price ratios. Above the basic heading, there is even more variety of methods, as various families of indexes, both additive and non-additive, can be used at that level. The commonly used methods (and those used in the 2005 ICP) for different stages of aggregation—the non-additive method (EKS) and two additive methods (GK and Iklé-Dikhanov-Balk [IDB]), are described briefly.

Country-Product-Dummy Method. The CPD method is a generalized multilateral method that uses regression techniques to obtain transitive PPPs for each basic heading. The data for a given basic heading consist of all the prices available for all the products in the basic heading for all the economies in the region. It treats the calculation of PPPs as a matter of statistical inference, an estimation problem rather than an index number problem.[23] The underlying hypothesis is that, apart from random disturbance, the PPPs for individual products within a basic heading are closely correlated between any given pair of economies. In other words, it is assumed that the pattern of relative prices of the different products within a given basic heading is similar in all economies. It follows from here that each economy has its own overall price level for the basic heading and it is this which fixes the levels of absolute prices of the products in the basic heading for the economy. These are valid assumptions, as basic headings are normally defined as groups of similar products. By treating the observed prices in the economies for the basic heading as random samples, the PPPs between each pair of economies and the common pattern of relative prices can be estimated using classical least-square methods. The basic formula underlying the CPD method is multiplicative but it is converted to an additive model by taking logarithms of both sides of the equation as follows:

$$\log(P_{ij}) = \log(\alpha_i) + \log(\beta_j) + \log(U_{ij})$$

where

P_{ij} are the prices expressed in each economy's national currency

22 Diewert (2010) observed that Gini was the first to discover certain principles of the EKS method; hence, he suggested calling the method the Gini-Eltetö-Köves-Szulc method (GEKS). *New Methodological Developments for the International Comparison Program*. http://www.econ.ubc.ca/diewert/dp0808.pdf

23 A version of the CPD, the weighted CPRD, has rather attractive economic properties. However, it may be unstable to noise in weights.

α_i is the product term

β_j is the economy term

U_{ij} is the error term.

Two major advantages of the CPD method are: the estimation of sampling errors for the PPPs; and the calculation of pattern of residuals that can be used to indicate potential problems with the consistency (or inconsistency) of prices collected by an economy for a particular basic heading. The CPD method is described in more detail in Appendix 1.

Eltetö-Köves-Szulc Method. The EKS formula (named after its developers Eltetö, Köves, and Szulc) was first used to produce transitive PPPs from a set of non-transitive bilateral parities obtained as simple geometric averages from individual price ratios for a pair of economies.[24] The EKS method differs from the CPD method in several important aspects. First, it is based on a binary approach rather than a multilateral one. The binary PPPs of all pairs of economies do not automatically produce transitive estimates, and, hence, an extra step is required to convert the binary comparisons into multilateral, transitive ones. Transitivity is the property whereby the direct PPP between any two economies yields the same result as an indirect comparison via a third economy. For example, if there are three economies *A*, *B,* and *C*, transitivity means that the same relationship between A and B will be observed no matter whether it is calculated by directly comparing *A* and *B* or whether they are each compared via *C*, i.e. $PPP_{A/B} = PPP_{A/C}/PPP_{B/C}$. The EKS method treats participating economies as a set of independent units, all with equal weight. The binary PPPs are made transitive by a procedure that minimizes the differences between them and the multilateral PPPs it produces. For each pair of economies, the EKS method provides PPPs that are similar to the PPPs that would be obtained if each pair of economies were compared separately. The EKS method is used to produce transitive PPPs from a set of bilateral PPPs.

In the first stage of the EKS method, PPPs are derived for each broad aggregate (e.g., household final consumption expenditure) above the basic heading level for each pair of economies in a region, using one as the base economy, followed by the same calculation using the other as the base economy. The PPP for each of the expenditure aggregates is calculated as the geometric mean of the two PPPs resulting from this process.

The eventual outcome is a matrix of PPPs for each pair of economies, for each aggregate for which PPPs are required, up to the level of GDP. Each matrix consists of non-transitive PPPs for each aggregate, which are then made transitive by applying the EKS formula. If three economies—A, B, and C—are involved, then the transitive PPP for economies A and B for a given aggregate is:

$$PPP^{A/B}{}_{transitive} = \left[\left(\frac{P^A}{P^B}\right) x \left(\frac{1}{P^B \big/ P^A}\right) x \left(\left(\frac{P^C}{P^B}\right) x \left(\frac{P^A}{P^C}\right)\right)\right]^{\frac{1}{3}}$$

In the general case for *n* economies, the EKS PPP is expressed as:

$$PPP_j^i = \prod_{\forall k} \left[\frac{P_k^i}{P_k^j}\right]^{\frac{1}{n}}$$

At the basic heading level, a variation on the EKS method, which allows for different weights being applied to product prices depending on whether they are classified as "representative" or "nonrepresentative," is referred to as the EKS* method. This method requires economies to consistently distinguish between representative and nonrepresentative products in their countries.

More details about the EKS method are presented in Appendix 2.

Geary-Khamis Method. The GK method is an average price method of computing PPPs and real final expenditures above the basic heading. It entails valuing a matrix of quantities, using a vector of international prices. The vector is obtained by averaging national prices across participating economies after they have

[24] The EKS method can be used both at the basic heading and above. At the basic heading level it becomes the Jevons index.

been converted to a common currency with PPPs and weighted by quantities. The PPPs are obtained by averaging, within participating economies, the ratios of national and international prices weighted by expenditure. The international prices and the PPPs are defined by a system of interrelated linear equations that require solving simultaneously. An advantage of the GK method is that it produces transitive PPPs and real final expenditures that are additive. Disadvantages of the method are: (i) a change in the group composition can significantly change international prices, as well as the relationships between economies; and (ii) the international price structure is biased toward large economies.

The traditional presentation for the Geary-Khamis system (in terms of international prices π and PPP) can be written as follows:

$$\pi_i = \sum_j p_j^i v_j \kappa_j^i$$

$$v_j = \sum_i \frac{\pi_i}{p_j^i} \omega_j^i$$

where $\omega_j^i = \frac{p_j^i q_j^i}{\sum_k p_j^k q_j^k}$, $\kappa_j^i = \frac{q_j^i}{\sum_l q_l^i}$ and $v_j = 1/PPP_j$, and p and q are prices and quantities.

Or, in matrix form:

$\pi = (K \circ P)v$

$v = (\Omega \mid P)^T \pi$

Thus, finding international prices and PPPs would involve solving one of the combined systems:

$\lambda\pi = (K \circ P)\ (\Omega \mid P)^T \pi$, or

$\lambda v = (\Omega \mid P)^T\ (K \circ P)v$,

where (◦) and (÷) are the element-by-element (*Hadamard*) matrix multiplication and division operators, respectively; i.e., $K \circ P\ [K_j^i\ p_j^i\ ]$ and $\Omega \mid P = [\omega_j^i / p_j^i\ ]$.

Iklé-Dikhanov-Balk Method. The IDB method is an average price method for computing PPPs and real final expenditures above the basic heading level. It entails valuing a matrix of quantities, using a vector of international prices. The vector is obtained by averaging national prices across participating economies after they have been converted to a common currency with PPPs. The IDB weighting scheme is based on real expenditure structures. The PPPs are obtained by averaging within participating economies the ratios of national and international prices weighted by expenditure. The international prices and the PPPs are defined by a system of interrelated linear equations that have to be solved simultaneously. The IDB method produces PPPs that are transitive and real final expenditures that are additive. However, the IDB method is less biased than the GK method, and in the real world comparisons, the IDB method produced results similar to the EKS (Deaton 2009, pp. 17–18).[25] The IDB index in terms of *[π-PPP]* can be presented as follows:

$$\pi_i = \sum_j p_j^i v_j \frac{\delta_j^i}{\sum_j \delta_j^i}$$

$$v_j = \sum_i \frac{\pi_i}{p_j^i} \omega_j^i$$

Or, in matrix form:

$\pi = (\Delta \circ P)v$

$v = (\Omega \mid P)^T \pi$

where $\Delta = \left[\frac{\delta_j^i}{\sum_j \delta_j^i} \right]$ is the matrix of economy real expenditure shares.

25 A. Deaton 2009. *Understanding PPPs and PPP-based National Accounts*. http://www.princeton.edu/rpds/papers/

Strengths and Weaknesses of Each Method

Each of the methods has its strengths and weaknesses.

Elementary aggregation. Outcomes from the CPD or CPRD method (which produces transitive PPPs) are neutral to the size of economies. A major advantage of CPD is its being a "statistical" method. Sampling errors can be calculated directly and the output includes a set of "expected" prices that enables a comparison with the observed prices, thereby highlighting potential errors. Thus, the CPD or CPRD also serves as a powerful diagnostic tool, being at the core of main diagnostic methods used in ICP procedures.

Above basic heading aggregation. The GK and IDB methods are transitive and additive but they are biased to different degrees. In the GK case, the international price structure is dominated by the larger economies in the comparison (this is also called the Gerschenkron effect). For example, in Asia and the Pacific region, the resulting GK international price structure would be dominated by the price structures of the PRC and India, which accounted for almost two-thirds of the region's GDP. In the IDB case, the international price structure would be less biased or more neutral, as it gives each economy equal weight, and, as a result, the IDB PPPs are usually close to the EKS PPPs in the real world comparison (Deaton 2009, pp. 17–18).

The EKS method is transitive and unbiased and gives each economy equal weight in the aggregation. However, real expenditures obtained from the EKS-based PPPs are non-additive. As a result, it is less suitable for analyses of output structures.

The Update used the CPD to obtain basic heading PPPs and the EKS to aggregate above the basic heading level for its "neutrality and unbiasedness" to prices of large economies, which is not the case for the other methods. These methods were also used to maintain consistency with the 2005 PPPs.

Limitations of the Update Methodology

In identifying the products to be priced for the Update, the simplified process was used to avoid incurring costs in updating the product lists. The starting point in identifying the product list, hence, was the 2005 Asia Pacific list, which consisted of a sample of goods and services available at that time and were considered to be both representative of expenditures in the economies in Asia and the Pacific region (or at least within groups of these economies) and comparable between them in 2005. In adopting this 2005 list as the starting point, it was assumed that most of the products remained relevant in 2009. While specifications of many staple foodstuffs may not significantly change between ICP rounds, specifications for electronic products are unlikely to remain the same from one ICP round to the next, given the rapid change in technology, changes in models, obsolescence, or entry of new products. For the Update, products no longer relevant in 2009 were deleted from the list to be priced. In a number of cases, while existing products were retained, their specifications had to be updated. Efforts were exerted to ensure that all economies would satisfy the minimum requirement for PPP computation, that of pricing at least one product in each basic heading.

It was discovered that some products were no longer available in the market (e.g., mercury thermometers, 21-inch TVs) and some products while still available, were no longer sold in large quantities, having been outmoded technologically (e.g., radio cassettes). Therefore, replacement products were identified (e.g., compact discs in place of radio cassettes, digital thermometer instead of mercury thermometer). It was also necessary to split or update specifications of products still sold in the market but whose characteristics had changed (e.g., splitting iron into dry iron and steam iron, changing specifications for table lamp with incandescent bulb to table lamp with fluorescent lamp).

The 2005 product list covered all geographic areas of the participating economies. In the Update, prices were collected only in the capital city and, in limited cases, in the vicinity of the capital city where a specified product was not available. Thus, these prices had to be calibrated to reflect national averages using adjustment factors from the economies' price submissions for the 2005 ICP. This, however, assumed that the 2005 capital to national price relationship remained in 2009. To overcome this limitation, the attempt to use the 2009 CPI information to calibrate capital city prices to national averages, however, proved to be more difficult for various reasons, among which were insufficient

overlap with intra-economy price data, urban bias in the CPI price collection, and inability of most economies to submit the 2009 CPI price data on time.

The national accounts data used in the Update were those provided in June 2011. The process of revising and upgrading national accounts is ongoing in most economies and so significant revisions may occur in many economies' accounts. The estimates provided for the Update may be revised in the coming years so that the estimates of GDP and its major aggregates in this publication may differ from the 2009 estimates contained in any individual economy's national accounts releases. More importantly, however, in deriving the required 155 basic heading weights for the Update, some economies used their 2005 GDP structures. This was because they were unable to produce their national accounts in time to meet the Update timetable and in some cases did not compile GDP expenditure-based estimates. In several cases, where expenditure-based estimates of GDP were compiled, they did not have the required details (155 basic headings).

4 Major Results and Findings

Introduction

This section presents the results of the Update. Expenditure on GDP is the statistical basis for the ICP, with the "basic heading" being the most detailed level for which PPPs and real expenditures are calculated. PPPs, real expenditures, and per capita real expenditures can be computed for all the 155 basic headings and at any desired level of aggregation up to and including GDP. Generally, results at the detailed levels tend to be less reliable than those at higher levels of aggregation. The results presented in this publication are at aggregated levels similar to the 2005 ICP for Asia and the Pacific.

PPPs express the values of local currencies in relation to a numeraire currency. In this study, the numeraire currency is the Hong Kong dollar as in the 2005 ICP for Asia and the Pacific. It should be noted, however, that PPPs are calculated in such a way that the choice of the numeraire currency has no impact on the relationship between the PPPs of the economies included in the comparison. If one economy's GDP is shown as being twice as large as another when measured in Hong Kong dollars, its GDP would still be twice as large if it were measured, say in Malaysian ringgit. Absolute levels of GDP will change depending on the numeraire currency, but the relativities between the economies do not change.

Analysis and Major Findings

The major results of the Update— PPPs, PLIs, real GDP, and per capita real expenditures—are presented in Table 9. To facilitate analysis of the results, some additional data on GDP in national currencies, market exchange rates, and midyear population for each economy are also included in the table.

Purchasing Power Parity, Nominal and Real Expenditures

Economies' GDP in real terms are consistently larger than GDP in nominal terms. Table 9 shows that GDP in real terms are consistently larger than GDP in nominal terms, except for Fiji. The PRC and India have the largest increase in absolute terms (15,035 trillion for the PRC and 12,893 trillion for India) and real GDP for the region is larger by 62% (43,952 trillion). The difference is due to the combination of the PPPs being expressed in Hong Kong dollars and the differences between the PPPs and the exchange rates of the regional economies. The exchange rate for higher income economies tends to be significantly higher than the corresponding PPPs, which leads to the large difference between the real and nominal GDP expressed in Hong Kong dollars. If the comparisons were expressed in the currency of one of the low income economies, then the values of GDP in real and nominal terms would be much closer, or perhaps the nominal expenditure on GDP for the region may even exceed the real expenditure, depending on the economy chosen as the base economy.

High income economies with real GDP per capita that are significantly above those of the other economies in the region include Singapore (HK$300,426); Brunei Darussalam (HK$275,712); Hong Kong, China (HK$231,611); and Taipei,China (HK$181,595). On the basis of real GDP per capita, the three lowest ranked economies are Nepal (HK$8,378); Bangladesh (HK$10,888); and Cambodia (HK$13,260).

PPPs show the number of local currency units that have the same purchasing power as HK$1.00 when the whole GDP is considered (column 4, Table 9). For example, the GDP PPP for the Bhutan ngultrum in 2009 was 2.53 (compared with HK$1.00) while the market

exchange rate was 6.25. This implies that prices of goods and services included in the GDP in Bhutan are less than 50% of those observed in Hong Kong, China. Comparing PPPs with exchange rates shows that PPPs are lower than exchange rates, except for Fiji, implying that price levels in all participating economies, except for Fiji, are lower than price levels in Hong Kong, China. Price levels tend to be higher in the economies that have relatively high per capita real GDP, such as Hong Kong, China. The case of Fiji is exceptional. A possible reason for the high prices is that most of the products included in the product list are imported in Fiji and so are closer to exchange rates than would be the case in other regional economies.

Other than Fiji, PPPs are lower than exchange rates for all economies with Hong Kong, China as the reference economy. However, the disparity between nominal and real GDP will be different if the base economy is changed. For example, if Malaysia had been chosen as the reference economy then the relationship between the PPPs and market exchange rates would have been different, with some PPPs higher than exchange rates, and others, lower.

Per Capita Real Gross Domestic Product Index

Figure 3 and column 12, Table 9, show each economy's per capita real GDP relative to HK$ 32,704 which is the average for Asia (regional average equal to 100). Presenting the data in terms of indexes shows the extent of dispersion of per capita real GDP. Singapore stands out as the richest economy, with its index nearly 10 times the Asia average. The poorest economy is Nepal, with per capita real GDP at just about one-quarter of the Asia average. Details are in Table 29.

Real and Nominal Gross Domestic Product: Size and Share of Asian Economies

The PRC and India account for over two-thirds of total regional real GDP. In real terms, the PRC accounts for 47.5% of total GDP of the participating economies while India has 19.9%. Together they account for over two-thirds of total regional GDP. Only three other economies contribute more than 3% of regional real expenditure on GDP and these are Indonesia; Taipei,China; and Thailand.

In nominal terms, the PRC has more than half (55.8%) of regional GDP—higher than its real share of 47.5%. India's share in nominal terms, on the contrary, is lower at 14.0% when compared to its real share of 19.9% as shown in Table 10. This reflects the higher price level in the PRC compared with that in India.

GDP shares of the high income economies are higher in nominal terms than in real terms. Shares of the four high income economies (Brunei Darussalam; Hong Kong, China; Singapore; and Taipei,China) are higher in nominal terms than in real terms, which is a phenomenon observed for high income economies in the ICP. This higher level of regional shares in nominal than in real terms does not depend on the currency in which PPPs and market exchange rates are denominated. The currency selected as numeraire affects absolute levels of the GDP in both real and nominal terms but will not affect the relativities between economies (i.e., their shares of the regional total).

GDP share of PRC and India differ in relation to their share of population. On the basis of real expenditure on GDP, the PRC's share is substantially higher than that of its population share (47.5% and 38.2%, respectively). However, the opposite is true in India. This indicates that per capita real expenditures in the PRC are significantly higher than those in India. Among the high income economies, Hong Kong, China has a GDP share of 1.4% compared with its population share of only 0.2%. The same relationship can be seen in Brunei Darussalam, Singapore, and Taipei,China, whose shares of real GDP are much higher than their population shares. The differences in the shares of economies in real and nominal terms are essentially due to price level differences. Economies with a PLI greater than 100 (based on the Asia average equal to 100) will have a real share less than the nominal share, and vice versa.

Table 9. Summary Results for Gross Domestic Product, 2009
Nominal Aggregates in Hong Kong dollar; Real Aggregates in PPP Terms
Reference Currency - Hong Kong dollar

Economy	Currency	GDP (million LCU)	Purchasing Power Parity	Exchange Rate (LCU/HK$)	Price Level Index (Asia=100)
(1)	(2)	(3)	(4)	(5)	(6)
Bangladesh	Taka	6,535,864	4.16	8.91	76
Bhutan	Ngultrum	61,281	2.53	6.25	66
Brunei Darussalam	Brunei dollar	15,595	0.14	0.19	121
Cambodia	Riel	43,287,080	229.74	534.11	70
China, People's Republic of	Yuan renminbi	34,631,660	0.64	0.88	117
Fiji	Fiji dollar	5,549	0.26	0.25	169
Hong Kong, China	Hong Kong dollar	1,622,203	1.00	1.00	162
India	Indian rupee	61,484,014	2.70	6.25	70
Indonesia	Rupiah	5,603,871,170	730.83	1,340.63	89
Lao People's Democratic Republic	Kip	47,562,170	473.18	1,098.84	70
Malaysia	Ringgit	679,687	0.29	0.45	104
Maldives	Rufiyaa	18,854	1.42	1.65	139
Mongolia	Tugrik	6,568,403	94.50	185.52	83
Nepal	Nepalese rupee	1,073,179	4.71	10.01	76
Pakistan	Pakistani rupee	13,780,244	4.15	10.54	64
Philippines	Philippine peso	8,026,144	3.58	6.15	95
Singapore	Singapore dollar	266,714	0.18	0.19	155
Sri Lanka	Sri Lankan rupee	4,825,047	7.99	14.83	87
Taipei,China	New Taiwan dollar	12,477,181	2.98	4.26	113
Thailand	Baht	9,050,715	2.47	4.42	91
Viet Nam	Dông	1,667,482,551	950.68	2,201.95	70
ASIA					**100**

GDP = gross domestic product, LCU = local currency unit, PPP = purchasing power parity.
a Real refers to purchasing power parity-adjusted values.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. For consistency and comparability with the 2005 PPP benchmarks, Asia refers to the 21 participating economies in the 2009 PPP Update in Asia and the Pacific, and the Islamic Republic of Iran and Macao, China. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China.

Table 9. Summary Results for Gross Domestic Product, 2009
Nominal Aggregates in Hong Kong dollar; Real Aggregates in PPP Terms
Reference Currency - Hong Kong dollar
(continued)

Nominal GDP (million)	**Real GDP**[a] (million)	**Population** (thousand)	**Per Capita Nominal GDP**	**Per Capita Real GDP**[a]	**Per Capita Real Expenditure Index**[a] (Asia=100)
(7)	(8)	(9)	(10)	(11)	(12)
733,675	1,570,115	144,200	5,088	10,888	33
9,810	24,213	683	14,355	35,430	108
83,355	111,994	406	205,206	275,712	843
81,046	188,422	14,210	5,703	13,260	41
39,296,540	54,331,621	1,334,740	29,441	40,706	124
21,941	21,133	834	26,312	25,343	77
1,622,203	1,622,203	7,004	231,611	231,611	708
9,843,031	22,735,794	1,165,945	8,442	19,500	60
4,180,021	7,667,814	231,370	18,066	33,141	101
43,284	100,517	6,120	7,073	16,424	50
1,496,470	2,336,258	28,310	52,860	82,524	252
11,415	13,297	315	36,292	42,274	129
35,405	69,510	2,730	12,969	25,461	78
107,235	228,090	27,226	3,939	8,378	26
1,307,024	3,319,126	165,200	7,912	20,092	61
1,304,585	2,240,383	92,227	14,145	24,292	74
1,425,541	1,498,403	4,988	285,817	300,426	919
325,308	604,041	20,450	15,907	29,537	90
2,925,814	4,190,945	23,079	126,777	181,595	555
2,045,583	3,663,144	66,903	30,575	54,753	167
757,276	1,753,993	86,025	8,803	20,389	62
70,382,530	**114,334,618**	**3,496,091**	**20,132**	**32,704**	**100**

Figure 3. Indexes of Per Capita Real Gross Domestic Product, 2009 (Asia = 100)

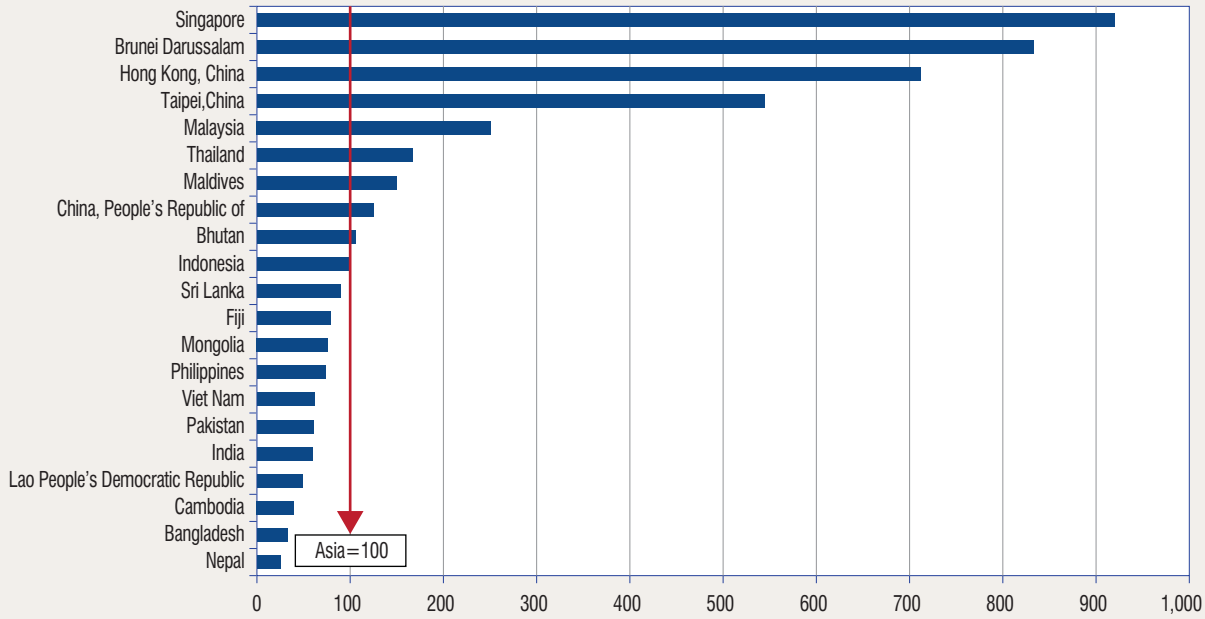


Table 10. Real and Nominal GDP, Levels and Economy Shares to Asia, 2009
(Real in PPP terms, Hong Kong, China as base; Nominal in Hong Kong dollar)

Economy	GDP Level (billion)		Percent Share in the Total GDP of Asia		Population (thousand)	Percent Share in the Total Population of Asia
	Real[a]	Nominal	Real[a]	Nominal		
China, People's Republic of	54,332	39,297	47.52	55.83	1,334,740	38.18
India	22,736	9,843	19.89	13.99	1,165,945	33.35
Indonesia	7,668	4,180	6.71	5.94	231,370	6.62
Pakistan	3,319	1,307	2.90	1.86	165,200	4.73
Taipei,China	4,191	2,926	3.67	4.16	23,079	0.66
Thailand	3,663	2,046	3.20	2.91	66,903	1.91
Malaysia	2,336	1,496	2.04	2.13	28,310	0.81
Philippines	2,240	1,305	1.96	1.85	92,227	2.64
Viet Nam	1,754	757	1.53	1.08	86,025	2.46
Bangladesh	1,570	734	1.37	1.04	144,200	4.12
Hong Kong, China	1,622	1,622	1.42	2.30	7,004	0.20
Singapore	1,498	1,426	1.31	2.03	4,988	0.14
Sri Lanka	604	325	0.53	0.46	20,450	0.58
Nepal	228	107	0.20	0.15	27,226	0.78
Cambodia	188	81	0.16	0.12	14,210	0.41
Brunei Darussalam	112	83	0.10	0.12	406	0.01
Lao People's Democratic Republic	101	43	0.09	0.06	6,120	0.18
Mongolia	70	35	0.06	0.05	2,730	0.08
Bhutan	24	10	0.02	0.01	683	0.02
Fiji	21	22	0.02	0.03	834	0.02
Maldives	13	11	0.01	0.02	315	0.01
Asia	**114,335**	**70,383**	**100.00**	**100.00**	**3,496,091**	**100.00**

GDP = gross domestic product, PPP = purchasing power parity.
a Real refers to purchasing power parity-adjusted values.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. For consistency and comparability with the 2005 PPP benchmarks, Asia refers to the 21 participating economies in the 2009 PPP Update in Asia and the Pacific, and the Islamic Republic of Iran and Macao, China. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China.

Per Capita Real Gross Domestic Product

The PRC and India's positions, as the biggest economies, change when per capita real GDP is considered. When the size of the economies is adjusted (or standardized) by factoring in population, the PRC and India drop to 8th and 17th positions, respectively, from first and second positions (Table 11). The Asia average per capita real expenditure on GDP of HK$32,704 is set to a base of 100 for the indexes. When data are presented in terms of indexes, which show each economy's per capita real GDP relative to the Asia average, the extent of dispersion becomes more obvious. However, Singapore stands out as the richest economy, with per capita GDP almost 10 times the Asia average, while the poorest economy is Nepal, with per capita real GDP about one quarter of the Asia average.

The disparity of per capita real GDP between the richest and poorest economies is striking. Indexes of per capita real GDP, from the highest to the lowest, are presented in Table 11. Four economies emerge significantly richer than the others, each with indexes of per capita real GDP in excess of 500 (i.e., more than five times the Asia average)—Singapore (919); Brunei Darussalam (843); Hong Kong, China (708); and Taipei,China (555). The data show a striking disparity between the richest and poorest economies, with the richest economy having a per capita real GDP about 36 times that of the poorest. At the lower end, Cambodia, Bangladesh, and Nepal have per capita real GDP that is less than half the Asia average. Malaysia and Thailand have per capita real GDP significantly above the Asia average, but are not as rich as the top five economies. Indonesia's per capita GDP is almost identical to the Asia average. Among the large economies that have per capita real GDP that is lower than the Asia average are the Philippines, Viet Nam, Pakistan, and India.

Table 11. Per Capita Real Gross Domestic Product, Levels and Indexes,[a] 2009

Economy	Level	Index
Singapore	300,426	919
Brunei Darussalam	275,712	843
Hong Kong, China	231,611	708
Taipei,China	181,595	555
Malaysia	82,524	252
Thailand	54,753	167
Maldives	42,274	129
China, People's Republic of	40,706	124
Bhutan	35,430	108
Indonesia	33,141	101
Asia	**32,704**	**100**
Sri Lanka	29,537	90
Fiji	25,343	77
Mongolia	25,461	78
Philippines	24,292	74
Viet Nam	20,389	62
Pakistan	20,092	61
India	19,500	60
Lao People's Democratic Republic	16,424	50
Cambodia	13,260	41
Bangladesh	10,888	33
Nepal	8,378	26

a Real refers to purchasing power parity-adjusted values.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. For consistency and comparability with the 2005 PPP benchmarks, Asia refers to the 21 participating economies in the 2009 PPP Update in Asia and the Pacific, and the Islamic Republic of Iran and Macao, China. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China.

Final Consumption Expenditures of Household and Government and Gross Fixed Capital Formation

Gross domestic expenditures consist of household final consumption expenditure (HFCE), government final consumption expenditure (GFCE), gross fixed capital formation (GFCF), change in inventories, net acquisitions of valuables, and net exports. Table 12a and Table 12b show the consumption components and gross fixed capital formation, their per capita values (in nominal and PPP terms) and real per capita indexes.

Components of gross domestic expenditures mirror similar results as GDP—nominal values being lower than real values. Except for Singapore and Fiji, expenditures for all components in real terms are higher than expenditures in nominal terms. The larger values in real terms imply that price levels in all these economies for all major GDP components are lower than those in Hong Kong, China. The price levels in Singapore and Hong Kong, China for GFCF and HFCE are not dissimilar, as the difference in the exchange rate and PPPs for GFCF and HFCE are minimal. For Fiji, however, the PPP for GFCF is much higher than the exchange rate, which indicates that costs of capital goods are higher in Fiji than in Hong Kong, China. The cost of transporting imports to Fiji may contribute to higher prices, as Fiji imports most of its capital goods.

Table 12a. Summary of Final Consumption Expenditure—Household, Government, and Gross Fixed Capital Formation, 2009
Nominal Aggregates in Hong Kong dollar; Real Aggregates in PPP Terms, Reference Currency - Hong Kong dollar

Economy	Population (thousand)	Exchange rate (LCU/HK$)	LCU (million)		
			HFCE	GFCE	GFCF
Bangladesh	144,200	8.91	5,021,632	353,998	1,639,517
Bhutan	683	6.25	27,321	13,082	25,301
Brunei Darussalam	406	0.19	3,731	3,261	2,826
Cambodia	14,210	534.11	34,342,089	3,702,321	5,104,047
China, People's Republic of	1,334,740	0.88	12,112,990	4,569,020	15,667,980
Fiji	834	0.25	4,204	841	1,416
Hong Kong, China	7,004	1.00	1,012,377	142,855	322,734
India	1,165,945	6.25	35,637,013	7,232,520	20,358,795
Indonesia	231,370	1,340.63	3,291,031,760	537,588,828	1,744,381,210
Lao People's Democratic Republic	6,120	1,098.84	26,080,629	7,179,754	15,065,393
Malaysia	28,310	0.45	338,894	95,918	136,824
Maldives	294	1.65	8,452	4,192	10,086
Mongolia	2,730	185.52	3,851,266	930,206	1,903,969
Nepal	27,226	10.01	853,631	115,298	228,467
Pakistan	165,200	10.54	11,272,560	1,038,327	2,289,632
Philippines	92,227	6.15	5,993,427	791,403	1,526,098
Singapore	4,988	0.19	108,292	30,408	76,119
Sri Lanka	20,450	14.83	3,103,770	851,550	1,147,447
Taipei,China	23,079	4.26	7,579,887	1,617,455	2,355,744
Thailand	66,903	4.42	4,974,825	1,202,702	2,208,398
Viet Nam	86,025	2,201.95	1,027,951,352	178,867,028	572,526,171
Asia	**3,496,070**				

GFCE = government final consumption expenditure, GFCF = gross fixed capital formation, HFCE = household final consumption expenditure, LCU = local currency unit.
a Includes individual consumption expenditure by households, by non-profit institutions serving households (NPISH) and by government.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. For consistency and comparability with the 2005 PPP benchmarks, Asia refers to the 21 participating economies in the 2009 PPP Update in Asia and the Pacific, and the Islamic Republic of Iran and Macao, China. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China. The shares of the aggregates to GDP are not additive due to the use of the Eltetö-Köves-Szulc (EKS) aggregation method, which is not additive.

The PPPs for GFCF are the highest among expenditure components in all economies in the region. This shows that capital goods are relatively more costly than household and government consumption goods

Per capita expenditures, nominal and real, on capital goods is highest compared with both HFCE and GFCE in the Maldives and the PRC. Brunei Darussalam, however, has the largest per capita real expenditure on GFCE within the economy and the region.

Actual Final Consumption

Actual final consumption (AFC) is a better measure of the welfare of an economy's population than real GDP per capita which is commonly used as an indicator of the welfare of an economy's population. In some cases, however, the composition of GDP is affected more than usual by components such as GFCF or exports of goods and services. Thus, it is useful to compare economies on the basis of the consumption expenditure of their households. HFCE is the measure normally used in national accounts,[26] but AFC may better measure the welfare of an economy's population. AFC is designed to capture HFCE on goods and services, plus expenditures

Table 12a. Summary of Final Consumption Expenditure—Household, Government, and Gross Fixed Capital Formation, 2009
(continued)

Nominal (million HK$)			Real[a] (million)		
HFCE	GFCE	GFCF	HFCE	GFCE	GFCF
563,697	39,738	184,042	1,329,896	95,331	309,008
4,374	2,094	4,050	11,105	7,907	8,270
19,943	17,432	15,107	27,970	29,553	16,794
64,298	6,932	9,556	144,704	37,763	17,723
13,744,608	5,184,466	17,778,455	20,114,567	10,415,887	20,527,607
16,625	3,327	5,597	17,597	4,435	4,943
1,012,377	142,855	322,734	1,012,377	142,855	322,734
5,705,161	1,157,861	3,259,258	15,347,872	3,008,521	5,636,822
2,454,836	400,996	1,301,163	4,784,275	804,648	2,238,837
23,735	6,534	13,710	50,679	36,531	25,087
746,144	211,183	301,247	1,151,498	435,321	478,991
5,118	2,538	6,107	6,415	5,190	5,825
20,759	5,014	10,263	41,205	16,429	17,047
85,297	11,521	22,829	199,935	27,453	34,245
1,069,176	98,483	217,166	2,941,604	363,839	360,870
974,183	128,636	248,055	1,798,995	254,287	353,132
578,803	162,524	406,845	570,411	198,901	403,719
209,258	57,412	77,362	377,046	206,225	113,447
1,777,432	379,282	552,406	2,707,871	662,011	693,798
1,124,377	271,827	499,128	2,247,528	573,158	732,391
466,837	81,231	260,009	1,027,379	376,601	523,872
31,719,909	**8,651,681**	**26,113,355**	**58,545,529**	**18,866,054**	**33,950,886**

26 HFCE is defined as the expenditure, including imputed expenditure, incurred by resident households on individual consumption goods and services, including those sold at prices that are not economically significant.

Table 12b. Summary of Final Consumption Expenditure—Household, Government, and Gross Fixed Capital Formation, 2009
Nominal Aggregates in Hong Kong dollar; Real Aggregates in PPP Terms, Reference Currency - Hong Kong dollar

Economy	Household Final Consumption Expenditure			
	Purchasing Power Parity	Per Capita Nominal GDP (HK$)	Per Capita Real[a]	Per Capita Real Expenditure Index[a] (Asia=100)
Bangladesh	3.78	3,909	9,223	55
Bhutan	2.46	6,400	16,250	97
Brunei Darussalam	0.13	49,096	68,859	411
Cambodia	237.3	4,525	10,183	61
China, People's Republic of	0.602	10,298	15,070	90
Fiji	0.239	19,936	21,102	126
Hong Kong, China	1.00	144,543	144,543	863
India	2.32	4,893	13,163	79
Indonesia	688	10,610	20,678	123
Lao People's Democratic Republic	515	3,878	8,281	49
Malaysia	0.29	26,356	40,675	243
Maldives	1.32	17,422	21,840	130
Mongolia	93.5	7,604	15,093	90
Nepal	4.27	3,133	7,344	44
Pakistan	3.83	6,472	17,806	106
Philippines	3.33	10,563	19,506	116
Singapore	0.190	116,048	114,366	683
Sri Lanka	8.23	10,233	18,437	110
Taipei,China	2.80	77,017	117,333	701
Thailand	2.21	16,806	33,594	201
Viet Nam	1,001	5,427	11,943	71
Asia		**9,073**	**16,746**	**100**

GDP = gross domestic product.
a Includes individual consumption expenditure by households, by non-profit institutions serving households (NPISH) and by government.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. For consistency and comparability with the 2005 PPP benchmarks, Asia refers to the 21 participating economies in the 2009 PPP Update in Asia and the Pacific, and the Islamic Republic of Iran and Macao, China. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China. The shares of the aggregates to GDP are not additive due to the use of the Eltetö-Köves-Szulc (EKS) aggregation method, which is not additive.

by government on services provided to individual households. It measures households' actual consumption rather than households' purchases, and it includes both what households buy directly and what they are supplied with for individual use by government (predominantly education and health services). Government services such as police, firefighting, and defense are classified as "collective consumption" because they are provided to the community and it is difficult to identify the actual service provided to any individual. Expenditures by non-profit institutions serving households are part of AFC because they are individual expenditures.

Actual final consumption is the dominant component of GDP. AFC ranges between 50% and 90% of GDP in almost all economies in the region (Table 13). The share of AFC in GDP can vary significantly, particularly when economies have very high investment and sizable net exports (either positive or negative). The very high trade deficits (i.e., imports significantly outweighing exports) of Fiji and Nepal account for their greater than 90% share of AFC in GDP. Cambodia's share of AFC in GDP is likewise almost 90%, mainly because of much lower gross fixed capital formation than in other economies in the region. The share of AFC in GDP is less than 50% in

Table 12b. Summary of Final Consumption Expenditure—Household, Government, and Gross Fixed Capital Formation, 2009
(continued)

Government Final Consumption Expenditure				Expenditure on Gross Fixed Capital Formation			
Purchasing Power Parity	Per Capita Nominal GDP (HK$)	Per Capita Real[a]	Per Capita Real Expenditure Index[a] (Asia=100)	Purchasing Power Parity	Per Capita Nominal GDP (HK$)	Per Capita Real[a]	Per Capita Real Expenditure Index[a] (Asia=100)
3.71	276	661	12	5.31	1,276	2,143	22
1.65	3,065	11,570	214	3.06	5,927	12,101	125
0.11	42,914	72,754	1,348	0.17	37,190	41,344	426
98.0	488	2,658	49	288.0	672	1,247	13
0.439	3,884	7,804	145	0.763	13,320	15,379	158
0.190	3,990	5,318	99	0.286	6,712	5,927	61
1.00	20,396	20,396	378	1.00	46,079	46,079	474
2.40	993	2,580	48	3.61	2,795	4,835	50
668	1,733	3,478	64	779	5,624	9,676	100
197	1,068	5,969	111	601	2,240	4,099	42
0.22	7,460	15,377	285	0.29	10,641	16,920	174
0.81	8,641	17,669	327	1.73	20,789	19,829	204
56.6	1,837	6,018	112	111.7	3,759	6,244	64
4.20	423	1,008	19	6.67	839	1,258	13
2.85	596	2,202	41	6.34	1,315	2,184	22
3.11	1,395	2,757	51	4.32	2,690	3,829	39
0.153	32,586	39,879	739	0.189	81,571	80,945	834
4.13	2,807	10,084	187	10.11	3,783	5,548	57
2.44	16,434	28,685	532	3.40	23,936	30,063	310
2.10	4,063	8,567	159	3.02	7,460	10,947	113
475	944	4,378	81	1,093	3,022	6,090	63
	2,475	**5,396**	**100**		**7,469**	**9,711**	**100**

Brunei Darussalam, Singapore, and the PRC either because of high (positive) net exports or because of large investment expenditures, or a combination of both.

Table 14 shows the economies in the order of their per capita real AFC. Investment or net international trade may affect an economy's position, but for most of the region's economies, the overall picture is broadly the same as that based on per capita real GDP.

The economies with the highest per capita real GDP are Singapore; Brunei Darussalam; Hong Kong, China; and Taipei,China. But the order changes when the comparison is based on per capita real AFC. Hong Kong, China moves up from third to first, Taipei,China moves up from fourth to second, while Singapore drops from first to third and Brunei Darussalam goes down from second to fourth. The PRC, with the most significant change in ranking, falls from eighth to fifteenth, and Bhutan drops from ninth to twelfth. Both these economies had high levels of gross fixed capital formation—more than one-third of GDP—in 2009, resulting in a more significant decline in the share of AFC within their GDP than elsewhere in the region.

Table 13. Share to Gross Domestic Product of Actual Final Consumption, Gross Fixed Capital Formation, and Balance of Exports and Imports, 2009

Economy	Share to GDP		
	AFC[a]	GFCF	Balance of Exports and Imports
Bangladesh	88.53	19.68	–3.43
Bhutan	56.05	34.15	–2.93
Brunei Darussalam	30.71	15.00	27.56
Cambodia	88.38	9.41	–0.10
China, People's Republic of	43.38	37.78	3.14
Fiji	92.78	23.39	–18.22
Hong Kong, China	65.93	19.89	7.48
India	72.15	24.79	–2.36
Indonesia	67.63	29.20	1.53
Lao People's Democratic Republic	59.58	24.96	–1.61
Malaysia	57.23	20.50	13.80
Maldives	61.65	43.80	–17.65
Mongolia	70.28	24.52	–3.71
Nepal	93.84	15.01	–10.42
Pakistan	96.85	10.87	–2.97
Philippines	85.46	15.76	–0.66
Singapore	41.60	26.94	19.97
Sri Lanka	74.20	18.78	–3.50
Taipei,China	70.32	16.55	6.02
Thailand	68.41	19.99	5.89
Viet Nam	67.24	29.87	–4.44

AFC = actual final consumption, GDP = gross domestic product, GFCF = gross fixed capital formation.
a Includes individual consumption expenditure by households, by non-profit institutions serving households and by government.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China. The shares of the aggregates to GDP are not additive due to the use of the Eltetö-Köves-Szulc (EKS) aggregation method, which is not additive.

The disparity in per capita real AFC between economies is much less for per capita real GDP. Hong Kong, China has the highest per capita real AFC in the region, and it is about 19 times as great as that in Nepal (27 times as great in per capital real GDP), which is the lowest economy according to this variable.

Components of Actual Final Consumption

AFC includes household final consumption and individual consumption by government. HFCE is by far the larger component of AFC covering a wide range of goods and services. It is, therefore, desirable to break down this item further, and the 1993 System of National Accounts[27] uses the Classification of Individual Consumption by Purpose (COICOP). In addition to classifying individual expenditures into major categories and subcategories, the COICOP also groups expenditures into four broad categories; nondurables, semi-durables, durables, and services. The following subsection provides a brief analysis of the major components of AFC.

Per capita real expenditure indexes of total AFC (in descending order) and the four broad groups are presented in Table 15. The data show the relative spread of expenditures among the economies across the categories. The nondurables category has the narrowest range at 336 to 68, compared with durables, at 2,030 to 13.

The richest economies have expenditures on all AFC components above the regional average. Only seven economies have expenditures for all AFC components

27 United Nations Statistics Division. 1993. *System of National Accounts, 1993*. http://unstats.un.org/unsd/nationalaccount/sna1993.asp

Table 14. Per Capita Real Actual Final Consumption, Levels and Indexes,[a,b] 2009

Economy	Level	Index
Hong Kong, China	152,707	818
Taipei,China	127,706	684
Singapore	124,981	669
Brunei Darussalam	84,682	453
Malaysia	47,225	253
Thailand	37,459	201
Maldives	26,060	140
Fiji	23,512	126
Indonesia	22,414	120
Sri Lanka	21,916	117
Philippines	20,761	111
Bhutan	19,859	106
Pakistan	19,459	104
Asia	**18,677**	**100**
Mongolia	17,895	96
China, People's Republic of	17,659	95
India	14,069	75
Viet Nam	13,710	73
Cambodia	11,719	63
Lao People's Democratic Republic	9,786	52
Bangladesh	9,640	52
Nepal	7,861	42

a Real refers to purchasing power parity-adjusted values.
b Includes individual consumption expenditure by households, by non-profit institutions serving households and by government.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. For consistency and comparability with the 2005 PPP benchmarks, Asia refers to the 21 participating economies in the 2009 PPP Update in Asia and the Pacific, and the Islamic Republic of Iran and Macao, China. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China.

that are above the Asia average. These are the four richest economies and Malaysia, Thailand, and the Maldives. The PRC and India both have lower than the Asia average expenditures for total AFC; and for three of the four categories—(nondurables, semi-durables, and services) for the PRC, and (nondurables, durables, and services) for India. While, India has a much higher per capita index for semi-durables (107, compared with 57 for the PRC), it has a significantly lower per capita index for durables (31 compared with an above average 119 for the PRC). Viet Nam, Cambodia, the Lao PDR, Bangladesh, and Nepal are all below the Asia average expenditures on total AFC and for each of the four categories of expenditure. Because food constitutes a large proportion of nondurables, the spread of per capita real expenditures between the top and bottom economies is much lower for this component (a high of 336 and a low of 68) than for the other components. The disparity for durables, however, is high (from a low of 13 to a high of 2,030), mainly because durables are mostly consumer goods, which are consumed in much larger quantities in higher income economies.

Per capita real expenditure indexes for different components of food reflect the diversity of consumption habits among the economies in the region. The share of expenditures for food and nonalcoholic beverages varies largely. Table 16 shows per capita real expenditure indexes of food and nonalcoholic beverages and the four major components—bread and cereals, meat and fish, fruits and vegetables, and other food and nonalcoholic beverages—with the Asia average for each component equal to 100.

Table 15. Indexes of Per Capita Real Expenditure for Components of Actual Final Consumption,[a] 2009
(Asia = 100)

Economy	Actual Final Consumption[b]	Nondurables	Semi-Durables	Durables	Services
Hong Kong, China	818	330	890	2,030	1,136
Taipei,China	684	336	1,095	1,657	794
Singapore	669	228	572	2,006	914
Brunei Darussalam	453	240	640	985	523
Malaysia	253	158	296	401	312
Thailand	201	149	284	204	249
Maldives	140	127	123	143	146
Fiji	126	153	129	82	116
Indonesia	120	157	129	89	93
Sri Lanka	117	126	132	134	74
Philippines	111	170	57	51	83
Bhutan	106	134	146	58	79
Pakistan	104	130	125	61	75
Asia	**100**	**100**	**100**	**100**	**100**
Mongolia	96	106	110	43	81
China, People's Republic of	95	93	57	119	96
India	75	78	107	31	75
Viet Nam	73	68	55	94	80
Cambodia	63	74	29	52	62
Lao People's Democratic Republic	52	68	30	59	42
Bangladesh	52	78	36	20	38
Nepal	42	72	27	13	24

a Real refers to purchasing power parity-adjusted values.
b Includes individual consumption expenditure by households, by non-profit institutions serving households and by government.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. For consistency and comparability with the 2005 PPP benchmarks, Asia refers to the 21 participating economies in the 2009 PPP Update in Asia and the Pacific, and the Islamic Republic of Iran and Macao, China. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China.

The relative spread of per capita real expenditures on food and nonalcoholic beverages is much smaller (from a low of 62 in Viet Nam to a high of 354 in Hong Kong, China) than in AFC (from 42 in Nepal to 818 in Hong Kong, China). The PRC and India, with more than 70% of the population in the region, however, have per capita real consumption of food and nonalcoholic beverages below the Asia average (PRC has an index number of 86 while India's is 82). Viet Nam, at 62, and the Lao PDR, at 65 are the economies with the lowest indexes of real expenditure on food and nonalcoholic beverages.

These reflect the differences in tastes and preferences, as well as agro-climatic conditions. Nepal has an index of 214 for bread and cereals, Bhutan has 253, and the Philippines 257. These are much higher than their indexes for total AFC of 42 for Nepal, 106 for Bhutan, and 111 for the Philippines. At the same time, Nepal has the lowest real GDP in the region, but has an index for bread and cereals that is more than twice the Asia average. On the other hand, Thailand, the PRC, and Mongolia's indexes of real consumption for meat and fish are well above the Asia average, but they are below the Asia average for bread and cereals. Hong Kong, China has the highest per capita consumption of meat and fish—more than eight times the Asia average.

Education and Health Expenditures

Per capita real expenditures on education are highest among the richest economies. Table 17 presents per capita real expenditures in education and health. Per capita real expenditures on education are much higher than the Asia average for the four richest economies

Table 16. Indexes of Per Capita Real Expenditure on Food and Nonalcoholic Beverages,[a] 2009
(Asia=100)

Economy	AFC[b]	Food and Nonalcoholic Beverages	Bread and Cereals	Meat and Fish	Fruits and Vegetables	Other Food and Nonalcoholic Beverages
Hong Kong, China	818	354	120	848	160	337
Brunei Darussalam	453	313	303	428	159	355
Taipei,China	684	286	215	382	309	250
Singapore	669	221	137	298	144	289
Indonesia	120	195	230	122	160	239
Philippines	111	188	257	250	50	211
Malaysia	253	164	126	235	148	149
Fiji	126	157	107	199	102	197
Sri Lanka	117	142	183	96	194	108
Bhutan	106	139	253	62	87	149
Thailand	201	138	89	124	181	148
Maldives	140	135	133	127	99	166
Pakistan	104	122	104	94	137	155
Mongolia	96	121	83	252	30	125
Asia	**100**	**100**	**100**	**100**	**100**	**100**
Bangladesh	52	89	154	74	75	60
Nepal	42	88	214	32	44	69
Cambodia	63	88	129	99	60	69
China, People's Republic of	95	86	65	137	80	64
India	75	82	91	30	105	96
Lao People's Democratic Republic	52	65	104	113	47	14
Viet Nam	73	62	86	93	41	34

AFC = actual final consumption.
a Real refers to purchasing power parity-adjusted values.
b Includes individual consumption expenditure by households, by non-profit institutions serving households and by government.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. For consistency and comparability with the 2005 PPP benchmarks, Asia refers to the 21 participating economies in the 2009 PPP Update in Asia and the Pacific, and the Islamic Republic of Iran and Macao, China. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China.

(Singapore; Brunei Darussalam; Hong Kong, China; and Taipei,China) and the Maldives, at five times more than the Asia average. On the other hand, Nepal's are less than one-third the Asia average, showing a large variation in per capita real expenditures on education. Of the economies with higher than average per capita real AFC—Pakistan and the Philippines have per capita real expenditures on education that are lower than the Asia average. Conversely, the PRC, Cambodia, the Lao PDR, Mongolia, and Viet Nam have lower than average per capita real AFC, but higher than average per capita real expenditures on education.

Per capita real expenditure on health is also highest among the rich economies. Hong Kong, China; Taipei,China; and Singapore are among the three economies with the highest per capita real expenditures on health and are well above the Asia average and that of health expenditures in other economies. Following these three economies is Brunei Darussalam, which spends about 2.5 times the Asia average for health, and followed by Thailand and the Maldives, both of which spend about double the Asia average. Also above the Asia average are Malaysia and Pakistan. The PRC, though it has a lower than average AFC, has health expenditures above the Asia average. Low income economy Bhutan notably has a higher than average expenditure on health and education, while India, a richer economy than Bhutan, has a lower than average expenditure on health and education. Among those on the lower end of per capita real expenditure on health are the Philippines and Bangladesh, whose health expenditures are barely more than one-quarter of the Asia average. Following closely are Indonesia and the Lao PDR.

Table 17. Indexes of Per Capita Real Expenditure on Education and Health,[a] 2009
(Asia = 100)

Economy	AFC[b]	Education	Health
Hong Kong, China	818	582	607
Taipei,China	684	667	948
Singapore	669	570	593
Brunei Darussalam	453	878	256
Malaysia	253	298	145
Thailand	201	205	195
Maldives	140	529	207
Fiji	126	100	97
Indonesia	120	185	32
Sri Lanka	117	123	75
Philippines	111	83	28
Bhutan	106	140	115
Pakistan	104	87	151
Asia	**100**	**100**	**100**
Mongolia	96	166	55
China, People's Republic of	95	105	109
India	75	48	76
Viet Nam	73	188	113
Cambodia	63	163	92
Lao People's Democratic Republic	52	161	33
Bangladesh	52	54	28
Nepal	42	32	53

AFC = actual final consumption.
a Real refers to purchasing power parity-adjusted values.
b Includes individual consumption expenditure by households, by non-profit institutions serving households and by government.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. For consistency and comparability with the 2005 PPP benchmarks, Asia refers to the 21 participating economies in the 2009 PPP Update in Asia and the Pacific, and the Islamic Republic of Iran and Macao, China. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China.

Transportation and Communication Expenditures

Total transport and communication expenditures vary significantly across the region. Per capita real expenditures on this aggregate are more than seven times the Asia average in Taipei,China; Singapore; and Brunei Darussalam. Also above the Asia average expenditure are Hong Kong, China and Malaysia. Expenditure on transport and communication in Nepal, on the other hand, is more than 90% below the Asia average, while Bangladesh and Bhutan fare only slightly better, at 86% below the Asia average. Table 18 shows the per capita indexes for transportation and communication.

Compared with Nepal—which has the smallest per capita expenditure on transportation among all the economies—the per capita expenditure on transportation of the richest economy, Singapore (on per capita GDP basis) is 127 times higher. Other than India, economies with lower than average per capita AFC also have lower than average per capita expenditure on transportation, while economies with higher per capita AFC have high per capita expenditures on transportation. The main exceptions are Fiji and the Maldives, which have indexes of per capita real expenditure on transportation lower than the Asia average.

Expenditures on Recreation and Culture and on Restaurants and Hotels

The pattern of per capita real expenditures on recreation and culture is broadly consistent with

Table 18. Indexes of Per Capita Real Expenditure on Transportation and Communication,[a] 2009
(Asia =100)

Economy	AFC[b]	Transportation and Communication	Transportation
Hong Kong, China	818	552	737
Taipei,China	684	750	821
Singapore	669	926	1,113
Brunei Darussalam	453	848	1,014
Malaysia	253	421	466
Thailand	201	192	279
Maldives	140	84	54
Fiji	126	70	99
Indonesia	120	121	139
Sri Lanka	117	118	148
Philippines	111	78	112
Bhutan	106	14	19
Pakistan	104	58	58
Asia	**100**	**100**	**100**
Mongolia	96	74	73
China, People's Republic of	95	83	60
India	75	83	103
Viet Nam	73	48	65
Cambodia	63	25	37
Lao People's Democratic Republic	52	33	47
Bangladesh	52	16	20
Nepal	42	7	9

AFC = actual final consumption.
a Real refers to purchasing power parity-adjusted values.
b Includes individual consumption expenditure by households, by non-profit institutions serving households and by government.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. For consistency and comparability with the 2005 PPP benchmarks, Asia refers to the 21 participating economies in the 2009 PPP Update in Asia and the Pacific, and the Islamic Republic of Iran and Macao, China. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China.

the corresponding AFC. Economies with high per capita real AFC have high per capita real expenditure on recreation and culture, and economies with low per capita real AFC have low per capita real expenditure on recreation and culture (Table 19). Compared with the Asia average, per capita real expenditure on recreation and culture is 33 times higher in Hong Kong, China. Taipei,China and Singapore also spend on recreation and culture substantially more than other economies in the region. Expenditure on recreation and culture are less than one-third the Asia average in Bangladesh, Nepal, the Lao PDR, the Philippines, and India, with Bangladesh and Nepal's expenditure on recreation and culture at 90% below the Asia average, indicating the wide disparity in per capita expenditure on recreation and culture across the region.

Two-thirds of the economies have per capita expenditure on restaurants and hotels lower than the Asia average. Hong Kong, China's per capita expenditure on restaurants and hotels is about 26 times the Asia average, while Thailand and to a lesser extent Malaysia are at par with the four high income economies. The only other economy to record a level higher than the Asia average per capita expenditure is Viet Nam (111). Bhutan's per capita real expenditures on restaurants and hotels is lowest at 2. Other economies well below the Asia average are Pakistan (12), Mongolia (15), and Nepal (17). Nepal spends more on recreation, culture, and restaurants and hotels than on transportation and communication (7).

Table 19. Indexes of Per Capita Real Expenditure on Recreation and Culture and on Restaurants and Hotels,[a] 2009
(Asia = 100)

	AFC[b]	Recreation and Culture	Restaurants and Hotels
Hong Kong, China	818	3,319	2,589
Taipei,China	684	1,847	1,064
Singapore	669	2,534	1,858
Brunei Darussalam	453	855	518
Malaysia	253	297	583
Thailand	201	191	1,023
Maldives	140	156	30
Fiji	126	181	80
Indonesia	120	85	51
Sri Lanka	117	76	32
Philippines	111	30	66
Bhutan	106	64	2
Pakistan	104	79	12
Asia	**100**	**100**	**100**
Mongolia	96	42	15
China, People's Republic of	95	117	92
India	75	32	43
Viet Nam	73	84	111
Cambodia	63	43	67
Lao People's Democratic Republic	52	30	39
Bangladesh	52	8	28
Nepal	42	10	17

AFC = actual final consumption.
a Real refers to purchasing power parity-adjusted values.
b Includes individual consumption expenditure by households, by non-profit institutions serving households and by government.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. For consistency and comparability with the 2005 PPP benchmarks, Asia refers to the 21 participating economies in the 2009 PPP Update in Asia and the Pacific, and the Islamic Republic of Iran and Macao, China. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China.

Gross Fixed Capital Formation

GFCF is a measure of the new capital investment in an economy in a particular accounting period. It measures the additions to the productive capacity of an economy's capital and is mainly made up of investment in construction, and machinery and equipment. A high level of GFCF within GDP indicates that the future productive capacity of an economy is being improved, although it is not possible to infer anything more because it may be due to one-off factors (eg. preparing for a major sporting event such as the Olympic Games) or simply of the fact that the economy is catching up on its relatively low levels of GFCF in earlier years. Table 20 shows levels and indexes of per capita real GFCF (total GFCF, machinery and equipment, and construction). Although machinery and equipment and construction are the two main components of GFCF, the real values for these two aggregates do not add up to total GFCF due to the use of the EKS aggregation method, which is not additive.

Construction is the dominant component of GFCF for most economies. Per capita expenditure on construction is lower than per capita expenditure on machinery and equipment in only three economies—Hong Kong, China; Malaysia; and Pakistan. Singapore's per capita expenditure on construction is the highest, at six times the Asia average and 12 times higher than that of Pakistan, which, at under 10% of the Asia average, is the lowest. For economies in which expenditure on machinery and equipment is larger than

Table 20. Per Capita Real Gross Fixed Capital Formation, Levels and Indexes,[a] 2009
(Asia = 100)

Economy	Level			Index		
	GFCF	Machinery and Equipment	Construction	GFCF	Machinery and Equipment	Construction
Singapore	80,945	24,632	61,438	834	1,224	660
Hong Kong, China	46,079	22,292	21,135	474	1,108	227
Brunei Darussalam	41,344	12,477	30,777	426	620	331
Taipei,China	30,063	12,557	14,937	310	624	160
Maldives	18,518	6,471	7,545	191	322	81
Malaysia	16,920	7,695	7,691	174	382	83
China, People's Republic of	15,379	2,675	15,535	158	133	167
Bhutan	12,101	1,879	14,611	125	93	157
Thailand	10,947	4,759	5,419	113	237	58
Asia	**9,711**	**2,012**	**9,307**	**100**	**100**	**100**
Indonesia	9,676	802	12,077	100	40	130
Fiji	5,927	2,362	2,659	61	117	29
Viet Nam	6,090	949	6,559	63	47	70
Mongolia	6,244	1,819	4,731	64	90	51
Sri Lanka	5,548	971	5,680	57	48	61
India	4,835	1,256	4,363	50	62	47
Lao People's Democratic Republic	4,099	825	2,949	42	41	32
Philippines	3,829	1,192	2,532	39	59	27
Pakistan	2,184	1,076	550	22	53	6
Bangladesh	2,143	244	2,723	22	12	29
Nepal	1,258	105	1,230	13	5	13
Cambodia	1,247	323	1,113	13	16	12

GFCF = gross fixed capital formation.
a Real refers to purchasing power parity-adjusted values.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. For consistency and comparability with the 2005 PPP benchmarks, Asia refers to the 21 participating economies in the 2009 PPP Update in Asia and the Pacific, and the Islamic Republic of Iran and Macao, China. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China.

that on construction, the difference between the highest and lowest points is less pronounced.

Relative price levels of the components of GFCF should also be considered in examining real expenditures. Higher per capita expenditures on construction than on machinery and equipment does not translate into high real per capita indexes, as price levels for machinery and equipment goods are higher than those for construction. In many economies, virtually all machinery and equipment goods are imported and so price levels are higher than locally produced goods and services because the prices of imported goods are determined in the world market.

The PRC and Bhutan deserve further attention. In the case of construction, these two economies stand out with relative per capita construction expenditures that are higher than those of any other economy apart from the three highest income economies (Singapore; Hong Kong, China; and Brunei Darussalam). In fact, per capita real expenditure on construction in the PRC is higher than that in Taipei,China, and Bhutan's is only slightly lower than Taipei,China's. Given that the PRC has almost 40% of the population in the region, this high per capita real expenditure translates into the PRC accounting for about 60% of the construction activity in the region.

Price Level Indexes for GDP and its Components

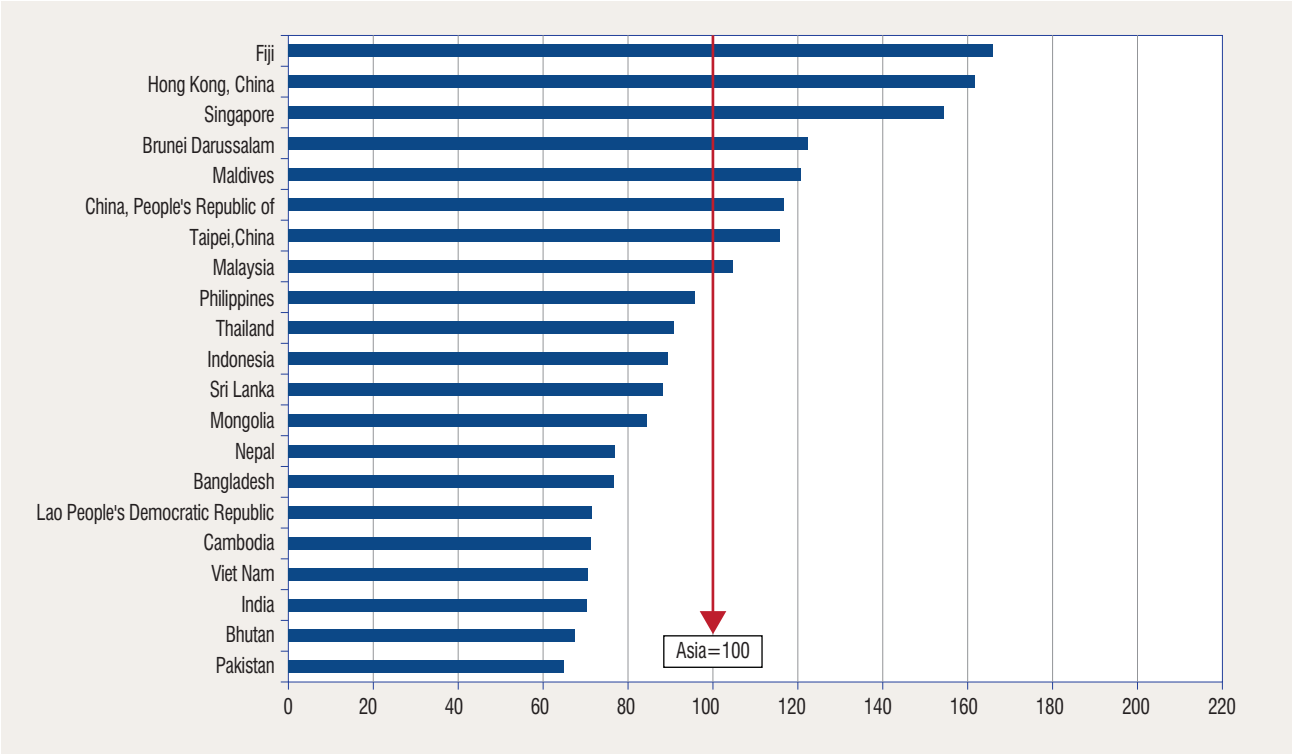
The index relating exchange rates and PPPs is known as the price level index (PLI).[28] In Figure 4, the PLIs are shown using the Asia average as the reference base (i.e., the Asia average is equal to 100). Economies with a PLI greater than 100 have higher prices than the Asia average while those with PLIs less than 100 have lower prices than the Asia average. The most expensive economies are Fiji; Hong Kong, China; and Singapore—all of which have price levels more than 50% higher than the Asia average. At the other end of the scale, Pakistan's price level is 36% lower than the Asia average, closely followed by Bhutan which reflect price levels more than 30% lower than the Asia average. A detailed discussion on deriving PLIs using the Asia average is in Appendix 4, while more detailed data are in Table 30.

High income economies have relatively high price level indexes. In Table 21, the PLI is presented as an index number with the Asia average as base. As a general rule, high income economies have a relatively high PLI while low income economies have a lower than average PLI because wages, and therefore the price of services, tend to be low in low income economies. Thus, PPPs for GDP are low compared with exchange rates, which are determined largely by the prices of goods and services traded in the world market.

Fiji has the highest overall price level for GDP, largely because a large share of the products consumed in Fiji is imported. The four economies with the highest per capita real GDP all have PLIs significantly higher than the Asia average. The eight lowest ranked economies (on the basis of real per capita GDP) have PLIs more than 20% below the Asia average.

The PLIs for actual final consumption and household final consumption expenditure are fairly consistent with those for GDP. The high share of AFC and HFCE within GDP in most economies would explain the strength of this relationship. The spread of PLIs for

Figure 4. Price Level Indexes of Gross Domestic Product
(Asia = 100)



28 The PLI is equal to the PPP for an economy divided by the exchange rate for that economy, both in respect of the same reference economy.

Table 21. Price Level Indexes: Gross Domestic Product and its Major Expenditure Aggregates, by Economy, 2009
(Asia = 100)

Economy	GDP	Actual Final Consumption[a]	Household Final Consumption Expenditure[b]	Final Government Consumption Expenditure	Gross Fixed Capital Formation		
					Total GFCF	Machinery and Equipment	Construction
Fiji	169	174	174	164	147	116	186
Hong Kong, China	162	188	185	218	130	85	196
Singapore	155	189	187	178	131	111	150
Brunei Darussalam	121	136	132	129	117	101	132
Maldives	139	141	147	107	136	87	198
China, People's Republic of	117	124	126	109	113	117	112
Taipei,China	113	122	121	125	104	73	142
Malaysia	104	120	120	106	82	73	93
Asia	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Philippines	95	100	100	110	91	86	97
Thailand	91	92	92	103	89	89	88
Indonesia	89	95	95	109	76	72	78
Sri Lanka	87	98	102	61	89	86	91
Mongolia	83	91	93	67	78	83	75
Nepal	76	78	79	92	87	89	87
Bangladesh	76	78	78	91	77	93	72
Lao People's Democratic Republic	70	79	86	39	71	79	66
Cambodia	70	77	82	40	70	87	59
Viet Nam	70	80	84	47	65	78	59
India	70	69	69	84	75	81	72
Bhutan	66	72	73	58	64	86	54
Pakistan	64	66	67	59	78	91	55

GDP = gross domestic product, GFCF = gross fixed capital formation.
a Includes individual consumption expenditure by households, by non-profit institutions serving households (NPISH) and by government.
b Includes individual consumption expenditure by households and NPISH.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. For consistency and comparability with the 2005 PPP benchmarks, Asia refers to the 21 participating economies in the 2009 PPP Update in Asia and the Pacific, and the Islamic Republic of Iran and Macao, China. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China.

these components, between the low and high income economies, also follows a similar pattern. In many cases, the PLI for GFCE differs by a significant amount from that for GDP, although there is no consistent pattern in the differences. The most striking feature of Table 21 is the narrow spread in the PLIs for GFCF on machinery and equipment. Almost all the economies in the region import a large proportion of machinery and equipment, so the price levels in each economy are set to a large extent by prices on the world markets. This results in far less variation in the prices observed than is the case for other types of products.

Interpreting the Results

The results in the form of real expenditure allow sustained comparison of the level of overall economic activity (GDP) in the participating economies. They also show some of the interesting components within GDP, such as AFC and GFCF.

Theoretically, the best means of extrapolating PPPs from a benchmark year would be to use time series of prices at the individual product level to extrapolate the prices of the corresponding products (or product groups) included in the ICP benchmark. In practice, it is not possible to use this type of approach because not all the economies

participating in the ICP have the detailed price data needed. Therefore, a conventional method to extrapolate PPPs using GDP deflators to indicate the relative price changes in each economy compared with the base or numeraire economy is used. The results are rough indicators of PPPs for each year. These extrapolated PPPs generally require some significant revisions once a new benchmark comparison becomes available.

One such set of extrapolated PPPs is published regularly by the World Bank in its annual publication *World Development Indicators* (WDI). It must be emphasized that the 2009 PPPs from the WDI and the PPPs from the Update are not directly comparable. The WDI PPPs are expressed in terms of US dollars, while the PPPs in the Update are expressed in Hong Kong dollars, as the Update was confined to Asia and the Pacific region. Hence, there is no direct link to US dollars in the Update.

Caution is also advised in interpreting the results of the Update. While the Update was built to extend the 2005 PPP results, the PPPs from the 2005 ICP and the Update, as with benchmark PPPs of other years, are not directly comparable. Spatial comparisons between countries, within a given year, are straightforward—real expenditure (volumes) is measured with the same price structure. Comparison over time, however, incorporates several effects, among which are changes in relative

Table 22. Update vs World Development Indicators Method: Purchasing Power Parity and Real Gross Domestic Product, 2009 (Hong Kong, China as base)

Economy	GDP (million LCU)	PPP	
		Update[a]	WDI[b]
(a)	(b)	(c)	(d)
Bangladesh	6,535,864	4.16	5.01
Bhutan	61,281	2.53	3.22
Brunei Darussalam	15,595	0.14	0.15
Cambodia	43,287,080	229.74	278.56
China, People's Republic of	34,631,660	0.64	0.70
Fiji	5,549	0.26	0.27
Hong Kong, China	1,622,203	1.00	1.00
India	61,484,014	2.70	3.23
Indonesia	5,603,871,170	730.83	1,085.33
Lao People's Democratic Republic	47,562,170	473.18	638.68
Malaysia	679,687	0.29	0.33
Maldives	18,854	1.42	1.91
Mongolia	6,568,403	94.50	119.36
Nepal	1,073,179	4.71	5.44
Pakistan	13,780,244	4.15	5.38
Philippines	8,026,144	3.58	4.42
Singapore	266,714	0.18	0.18
Sri Lanka	4,825,047	7.99	9.34
Taipei,China	12,477,181	2.98	3.16
Thailand	9,050,715	2.47	3.12
Viet Nam	1,667,482,551	950.68	1,203.79

GDP = gross domestic product, LCU = local currency unit, PPP = purchasing power parity, WDI = World Development Indicators.
a The 2009 PPP Update provides an intermediate benchmark and more firmly based real expenditures and price level indexes for 2009 than would have been possible using the extrapolation technique.
b ADB staff estimates using PPPs from the WDI Online (World Bank 2012). The WDI method is described on page 12.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity Update for computation purposes. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China.

prices between countries, changes in the structure of the individual economies, and changes in the structure of the region in terms of each economy's contribution to the regional total. These limitations also apply to the Update results.

In this section an attempt is made to compare real GDPs in 2009 derived using PPPs from the Update and PPPs available from WDI Online and rebased to the Hong Kong dollars. Table 22 shows the comparison between the 2009 PPPs and real GDPs from the Update and those extrapolated from the WDI.

To the extent that the PPPs from the WDI can be compared with those from the Update, it appears that those from the WDI are generally higher than those from the Update. However, it is highly probable that the PPPs in the Update are more robust because they are based on a direct comparison of prices in the different economies using techniques similar to those in the 2005 ICP. In other words, the Update provides a set of PPPs for Asia and the Pacific economies that can be used as an updated benchmark for the region.

Table 22. Update vs World Development Indicators Method: Purchasing Power Parity and Real Gross Domestic Product, 2009 (Hong Kong, China as base) *(continued)*

2009 Real GDP (million HK$)		**Ratio**	
Update[a]	**WDI**[b]	**PPP**	**Real GDP**
(e)	(f)	(c)/(d)	(e)/(f)
1,570,115	1,305,540	83.15	120.27
24,213	19,028	78.59	127.25
111,994	104,041	92.90	107.64
188,422	155,398	82.47	121.25
54,331,621	49,409,204	90.94	109.96
21,133	20,756	98.22	101.82
1,622,203	1,622,203	100.00	100.00
22,735,794	19,037,918	83.74	119.42
7,667,814	5,163,287	67.34	148.51
100,517	74,470	74.09	134.98
2,336,258	2,060,000	88.18	113.41
13,297	9,853	74.10	134.95
69,510	55,028	79.17	126.32
228,090	197,195	86.45	115.67
3,319,126	2,561,740	77.18	129.57
2,240,383	1,815,933	81.05	123.37
1,498,403	1,455,572	97.14	102.94
604,041	516,710	85.54	116.90
4,190,945	3,947,658	94.19	106.16
3,663,144	2,898,600	79.13	126.38
1,753,993	1,385,194	78.97	126.62

5 Governance, Organization, and Implementation

Introduction

In the 2005 ICP, ADB coordinated the activities with the 23 economies participating in the ICP in Asia and the Pacific region. ADB established a regional advisory board as the chief policymaking body. Members of the board were chosen from a mix of the main stakeholders, regional agencies, and NSOs. The board established regional goals, priorities, and objectives.

The scope of the Update was narrower than that of the 2005 ICP, so ADB did not see a need to continue with the regional advisory board. However, a framework of partnership between ADB and the national implementing agencies stipulating the responsibilities of both parties was established. This ensured the systematic involvement of the participating economies in all phases of the Update. The bottom up approach adopted in the 2005 ICP was also implemented in the Update, with an emphasis on how the success of the Update depended on all parties taking ownership. The close ties of ADB, as the regional coordinating agency (based in the Economics and Research Department), developed with NSOs during the 2005 ICP round was instrumental in facilitating this process.

Administrative Arrangements

An inception workshop was held in Bangkok from 19 to 22 January 2009 to launch RETA 6482: Improving Price Collection of Non-Household Expenditure Components and Updating PPP Estimates for Selected Developing Member Countries (DMCs). The goals of the workshop were to

(i) present the objectives, activities, and timelines for RETA 6482;
(ii) discuss the deliverables required from participating DMCs and get their commitment to include the TA requirements in their respective work programs;
(iii) present and discuss the methodology for updating PPP estimates;
(iv) expose participants to the possibility of compiling subnational and/or intraregional PPPs; and
(v) review CPI price collection and compilation activities of participating DMCs.

Workshop participants were mainly senior staff from NSOs and, in some cases, other national agencies involved in collecting prices and compiling price indexes. The outcome of the workshop was agreement on ADB's proposals to reduce the numbers of products to be priced, adjust price levels obtained from the reduced (core) product list to those consistent with the full list, and adjust from capital city to national average prices for 2009.

Unlike the 2005 ICP, which was a global statistical program coordinated by the World Bank, RETA 6482 was an ADB research initiative, with the activities confined to ADB participating member economies. As a result, it did not use the 2005 ICP global governance structure, which included the ICP Global Office and the Technical Advisory Group at the World Bank, and the ICP Executive Board. The World Bank's involvement was limited to providing a resource person for technical assistance and support, particularly with the methodological aspects of the Update.

ADB was the executing agency for the RETA, with its Economics and Research Department being responsible for its administration. NSOs or national implementing agencies of ADB member economies that collected prices in an economy were the implementing agencies.

The main activities were

(i) developing a core product list for household consumption for 2009,
(ii) collecting prices for the core household product list in capital cities,

(iii) mainstreaming household product price surveys in CPI surveys,
(iv) identifying a construction product list and collecting prices,
(v) identifying a core product list for machinery and equipment and collecting prices,
(vi) developing alternative methodologies for pricing equipment,
(vii) collecting prices for government services,
(viii) validating price data,
(ix) updating and validating 2009 GDP weights,
(x) computing PPP-based measures for 2009, and
(xi) preparing reports and publications.

Data Validation Procedures and Activities

Data within and across countries were validated through the same procedures as in the 2005 ICP. One additional procedure was available in 2009—comparing product prices and basic heading values in 2009 with those for similar items in 2005. In addition, trend checks in the national CPI between 2005 and 2009 at basic heading level, and between quarter trends in prices at the lowest level possible, were also introduced.

The first steps involved in validating prices were to check price data with a CV (i.e., the standard deviation divided by the arithmetic mean) greater than 30% or with minimum-maximum price ratios greater than 0.33. The Quaranta and Dikhanov tables were the main editing tools used because they provided a systematic means of validating data and of identifying any inconsistencies with the prices reported at both intra- and inter-country levels.

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, price level index, exchange rate, weight, and CV for each product within a basic heading, for each economy. They also provide summaries for basic headings.

The Dikhanov table (named after Yuri Dikhanov, World Bank) was an innovation introduced to help edit prices collected for the 2005 ICP. It shows the relationships between product prices across all basic headings for each economy in a region. The Dikhanov table uses the CPD model as the basis for analyzing price data and it shows the distribution of the prices actually provided by an economy compared with prices estimated by the model. The difference between the observed and estimated price is an analogue of the conventional unit to express parity indexes used in the Quaranta tables. Large differences between the 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 like the other economies.

To ensure data quality and comparability, four regional data review workshops were held for price data validation. One workshop each was held to (i) review the capital city to national price level adjustment ratios, (ii) conduct a technical review of the preliminary 2009 PPPs, and (iii) undertake a comparative analysis of the 2009 and 2005 PPPs, including a structural analysis of the 2009 PPP-based GDPs and subcomponents. The final results of the Update were presented to the heads and price statisticians of the national implementing agencies in the Dissemination Meeting for Heads of National Implementing Agencies before the preparation of the regional report. The Conference on Developments in the ICP in Asia and the Pacific region was the venue for the presentation and discussion of the PPP updating methodology and its results. An ICP Experts' Round Table Discussion was convened to discuss the 2009 PPPs and its analysis and interpretation. Table 23 shows the schedule of the workshops and meetings.

Price Collection and Validation Tools[29]

For data entry and economy level validation, ADB developed the Price Collection Tool (PCT) for products in household final consumption expenditure, gross fixed capital formation on construction and on machinery and equipment, compensation of employees in government final consumption expenditure, and GDP expenditures. A single module was used for household consumption, while economy-specific submodules were created for construction, machinery and equipment, compensation

[29] This section draws heavily from *Improving Product Parity for the 2009 Purchasing Power Parity Update for Asia and the Pacific* by Eileen Capilit. http://beta.adb.org/data/icp/reta-6482-activities

Table 23. 2009 Purchasing Power Parity Update Regional Workshops and Meetings

Regional Data Review Workshop/Meeting	Date	No. of Participants
Inception Workshop	19–22 January 2008	22
First Regional Data Review Workshop	11–14 May 2009	25
Capital City to National Price Adjustment Workshop	14–15 May 2009	25
Second Data Review Workshop	31 Aug–4 Sept 2009	28
Third Data Review Workshop	1–8 December 2009	25
Fourth Data Review Workshop	15–20 March 2010	24
Technical Review Workshop	23–26 June 2010	25
Preliminary Results Workshop	30 Aug–2 Sept 2010	25
Dissemination Meeting for Heads of National Implementing Agencies	8 March 2011	36
Conference on Developments in the International Comparison Program (ICP) in Asia and the Pacific	9–10 March 2011	64
ICP Experts' Round Table Discussion	8–10 June 2011	19

of employees, and GDP expenditures. The PCT used in the Update was built on an MS Excel platform for simple installation and use. The goal of developing the PCT was to minimize the burden on economies, facilitate data transfer and archiving, minimize the costs of training staff, and enable economies to conduct their own intra-economy data validation.

To minimize data entry errors, the PCT was developed so that data can be written only into those cells where data entry and/or input from economies is valid. Other cells are protected and pre-populated according to the requirements of data collection (e.g., product specifications, units of measurement, expected range, and preferred quantity). The main advantage of using the PCT is that error alerts and simple diagnostics give users early warning on possible data entry errors or certain edit violations based on set criteria. The seven modules of the PCT are described as follows.

Module 1: PCT for Household Final Consumption Expenditure

The PCT for household final consumption expenditure has two main modes of operation: (i) data entry mode, and (ii) analysis mode. Under the data entry mode, users can enter details about the price and quantity of each product, the type of outlet in which the product is sold, and its location. The program performs basic checks such as ensuring that only numbers are entered in numerical fields. The data analysis mode provides basic summary statistics for each product that include the converted prices, average price, number of quotations, CVs, minimum and maximum values, and minimum and maximum ratios. The average product prices can also be graphed to provide a visual depiction of the price behaviour for each product. Some useful analytical parameters are provided and data entries that are outside specified ranges are highlighted (e.g., a CV of more than 30% will be highlighted in red). In addition, converted prices that are above one standard deviation from the mean are highlighted in red. The data entry mode is shown in Appendix Table 5.1, while the data analysis mode is illustrated in appendix 5.2

Module 2: Price Collection Tool for Gross Fixed Capital Formation on Construction

A total of 21 submodules were created in the PCT for construction. Each submodule has an input sheet designed to collect information on price, quantity, and unit of measurement, source of the price information, product characteristics, and special comments made by construction experts. The prices collected in the 2005 ICP and the type of outlet from which they were collected were shown alongside each product to provide a check on the Update prices. Each product's price in 2009 was compared with the prices submitted for the 2005 ICP and the cell was highlighted in red if the difference between the latest price and that from the 2005 ICP was greater than 50%. A sample of this module is shown in Appendix Table 5.3.

Module 3: Price Collection Tool for Compensation of Government Employees

Twenty-one submodules were prepared for the data entry of compensation of government employees. The guidelines, specifications, and descriptions required for each occupation were provided in the product catalog for the Update. Compensation data were

checked against the corresponding information from the 2005 ICP and pre-populated into the PCT. Any occupation for which the compensation rate increased by more than 50% compared with that in 2005 was highlighted in red. The layout of this module is shown in Appendix Table 5.4.

Module 4: Price Collection Tool for Gross Fixed Capital Formation on Machinery and Equipment (Imports Data)

In the 2005 ICP, the prices for different types of machinery and equipment were collected directly from sellers. To reduce costs, an option was provided in the Update for collecting information on imports of machinery and equipment for 2005 and 2009 from economies' trade statistics. Details requested were the value of imports (both c.i.f., and f.o.b.)[30] insurance, freight, customs duties, non-deductible value added tax or other product taxes, and installation costs. Details of customs duties, taxes, and installation costs could be entered either as a value or as a percentage to be applied to the value of imports. Data for 2009 were compared with the corresponding data for 2005 and those that broke preset edit limits were highlighted in red. A PCT was also developed for this and is shown in Appendix Table 5.5.

Module 5: PCT for Gross Fixed Capital Formation on Machinery and Equipment (Prices)

This module was developed for direct collected price collection for machinery and equipment in 2009 (Appendix Table 5.6). The PCT was set up in a similar way to module 2 (for collecting prices relating to gross fixed capital formation on construction).

Module 6: Automatic Processing of Outputs from the Price Collection Tool (For ADB)

ADB maintains a set of macros that automatically processes data received from economies. These subroutines enable ADB to review data submitted by economies. The automated system uses MS Excel functionalities such as macros, auto filter function, conditional formatting, pivot table, and visual basic programming. It provides separate reports for household and non-household prices and provides details such as the number of products priced in each of 2005 and 2009, the number of products available from the CPI, and the numbers falling into various ranges of CV. A sample of the summary table for household products generated by this module is shown in Appendix Table 5.7.

Module 7: Price Collection Tool for Gross Domestic Product Expenditures

The module provides the codes and descriptions of the 155 GDP expenditure levels (basic headings) required for PPP computation which facilitates data entry and verification of aggregations. It automatically calculates the weights (shares) for the latest GDP expenditures data provided. The 2005 GDP expenditure levels used in the 2002 ICP round are also provided for comparison with the 2009 GDPE values. Appendix Table 5.8 illustrates the data entry mode and the resulting GDP weights are shown in Appendix Table 5.9.

Reports on Economy Experiences in the 2009 PPP Update

A brief report on the economies' experiences of working on the Update is in Appendix 6. The economy's report includes administrative setup; use of the CPI infrastructure in the price surveys for the Update; use of the PCTs; price data validation procedures adopted; GDP expenditure weights computation; overall assessment of their participation in the PPP updating; and the need for PPP advocacy activities.

30 Imports valued cost insurance and freight include the value of the goods and the insurance and freight costs involved in transporting them to the entry point in the importing country. Imports valued free on board are valued at the point at which they leave the exporting country.

6 Uses and Applications

Introduction

The types of users of PPPs and PPP-converted data have increased with the appreciation of the benefits from using such data. International organizations, universities, economic analysts, private sector businesses, and policy makers are among the more popular users of PPP-based data. A substantial portion of this section was lifted from the ADB 2007 publication on the 2003 ICP in Asia and the Pacific. A substantial portion of this section was lifted from the ADB 2007 publication on the 2005 ICP in Asia and the Pacific (footnote 7).

Penn World Tables

PPPs and real GDP measured using PPP conversion factors have been increasingly used to analyze productivity, particularly labor productivity, catch-up and convergence issues, and global and regional inequality. Phase IV of the ICP (1980) marked a new beginning for the ICP, with a coverage of 60 countries from all regions of the world. In addition, the availability of panel data covering many countries over long periods in the form of the Penn World Tables has made PPPs and PPP-converted data much more accessible to researchers and analysts interested in econometric analysis. Summers and Heston[31] describe the methodology used in their extrapolations of the benchmark data, and the latest set of Penn World Tables provides extrapolated data for 189 economies over 1950–2009 with 2005 as the base year.

World Bank Extrapolations

The World Bank also produces extrapolations of PPPs that are used to compute PPP-converted data on GDP, which are regularly published in the *World Development Indicators*. The World Bank PPPs are also used to estimate national, regional, and global poverty estimates showing the number of poor living under the $1- and $2-a-day international poverty lines.

Maddison Time Series

Angus Maddison from the University of Groningen constructed long time series of real GDP and per capita real GDP for a large number of countries. His series have been available in his much-celebrated publications such as *Monitoring the World Economy, 1820–1992* and *Contours of the World Economy 1–2030 AD: Essays in Macro-Economic History*.[32] The data series generated by Maddison are available on the Groningen Growth and Development Centre database located at the University of Groningen.

The availability of rich data series from the Penn World Tables, Maddison, and the World Bank has enabled researchers to work on catch-up and convergence on an unprecedented scale. Many studies have examined the issue of income convergence using PPP-based measures of per capita GDP. These papers test whether growth rates (typically measured in local currency units rather than PPPs) are significantly explained by the level of initial per capita GDP or per worker, which is termed β-convergence. Clearly, international comparability of the per capita GDP or per worker is important, so PPP-based GDP measures play an important role in this context. Moreover, of particular interest is the strength of the coefficient on initial per capita GDP, since this determines the speed of convergence.

31 Summers, R. and A. Heston. 1991. The Penn World Table (Mark 5): An Expanded Set of International Comparisons, 1958–1988. *Quarterly Journal of Economics* 106(2):327–368.

32 Maddison, Angus. 1995. *Monitoring the World Economy, 1820–1992*. Paris: OECD; and Angus Maddison. 2007. *Contours of the World Economy 1–2030 AD: Essays in Macro-Economic History*: New York: Oxford University Press.

Other Studies

Convergence Testing

Other studies also examine the distribution of per capita GDP, or σ-convergence. Again, since switching from exchange rate- to PPP-converted per capita GDP will significantly alter the distribution of the series (switching to PPP generally raises per capita GDP in the poorest countries relative to higher income economies), the use of PPPs is vital in this context. Prominent studies testing convergence using PPP-based initial GDP measures are Barro and Sala-i-Martin, Barro, Mankiw et al., and Islam on using panel data.[33] Extensive reviews of this literature can also be found in Durlauf and Bernard and Sala-i-Martin.[34]

The availability of real GDP and investment series has prompted researchers to estimate productivity growth and examine issues of convergence. Real GDP is used as an output measure, and real investment series (comprising nonresidential construction, and machinery and equipment) are used in building capital stock series. Fare et al. use the Malmquist productivity index, in conjunction with labor force figures combined with output and capital data, to examine productivity growth performance among OECD countries.[35] They provide evidence for a catchup in productivity, as shown by the movement of countries toward the technology frontier (Coelli et al. 2005).[36] A similar study, on a larger scale, by Rao and Coelli also focused on the issues of productivity performance. This study considered two categories of output, i.e., real GDP (nominal in local currency units converted using PPPs) and levels of inequality measured using the Gini coefficient when real GDP, as well as level of inequality, are considered in assessing the performance of nations. Studies on international productivity comparisons make use of PPPs and PPP-converted real aggregates for analytical purposes.

Carbon Emission Projections

Applications of PPPs also arise in some unexpected areas. A particular example of interest is the recent debate about the use of PPPs in the construction of projections of carbon emission. The initial approach used by the Intergovernmental Panel on Climate Change based on market exchange rates was criticized by Castles and Henderson.[37] The arguments surround the projected growth rates of industrial and developing countries and how the projections differ if the initial position of the countries is determined on the basis of per capita GDP converted into US dollars (or any other reference currency of choice) using market exchange rates instead of PPPs. McKibbin and Stegman report results from their models that suggest that market exchange rate–based GDP figures and gaps between countries produce projections of carbon emissions for 2050 that are 22% higher than those derived using PPP-based GDP gaps between countries.[38] Their results suggest that it is important to measure gaps between countries using PPP-converted per capita GDPs.

Regional and Global Inequality Measurements

Another important use of PPPs is in measuring regional and global inequality. To study intra-country, intraregional, and interregional inequality, it is necessary to convert per capita GDPs into a common currency unit. The level of inequality is shown to depend on whether market exchange rates or PPPs are used in the conversion process. Milanovic reports that a commonly used measure of inequality, the Gini coefficient, for 1993 and based on data for over 90 countries, is equal to 0.805 when market exchange rates are used, but only 0.660 when PPPs are used.[39]

33 Barro, R. 1994. *Economic Growth and Convergence*. San Francisco: Institute for Contemporary Studies; Barro, R. and X. Sala-i-Martin. 1992. Convergence. *Journal of Political Economy* 100(2):223–251; Mankiw, N. G., D. Romer, and D. Weil. 1992. A Contribution to the Empirics of Economic Growth. *Quarterly Journal of Economics* 107(2): 407–437; Islam, N. 1995. Growth Empirics: A Panel Data Approach. *Quarterly Journal of Economics* 110(4):1127–1130.

34 Durlauf S. and A. Bernard. 1995. Convergence of International Output Movements. *Journal of Applied Econometrics* 10(2):97–108; Sala-i-Martin, X. 2002. 15 Years of New Growth Economics: What Have We Learnt? *Discussion Paper* #0102–47. New York: Columbia University.

35 Färe, R., S. Grosskopf, M. Norris, and Z. Zhang. 1994. Productivity Growth, Technical Progress, and Efficiency Change in Industrialized Countries. *American Economic Review* 84(1):66–83.

36 Coelli, T., D.S.P. Rao, C. O'Donnell, and G. Ballese. 2005. *An Introduction to Efficiency and Productivity Analysis*. New York: Springer.

37 Castles, I. and D. Henderson. 2003. *Intergovernmental Panel on Climate Change Issues: A Swag of Documents*. Canberra. http://www.lavoisier.com.au/papers/articles/IPPCissues.html.

38 McKibbin W. and A. Stegman. 2005. Convergence and Per Capita Carbon Emissions. *CAMA Working Papers* 2005–10. Canberra: Center for Applied Macroeconomic Analysis, Australian National University.

39 Milanovic, B. 2002. True World Income Distribution, 1988 and 1993: First Calculation Based on Household Surveys Alone. *Economic Journal* 112(476):51–92.

In a similar vein, a study by Dowrick and Akmal has shown that the aggregation method used in the computation of PPPs can also influence the numerical measure of inequality.[40] Their study demonstrated that the use of the GK method for computing PPPs can lead to a downward bias in the inequality measure compared with that derived using a method developed by Afriat.[41] The type of divergence indicated by Dowrick and Akmal can also be seen in the case of the more commonly used EKS method of aggregation (the method used in ICP in Asia and the Pacific region).

Human Development Index

Among more celebrated uses of PPPs is in the United Nations Development Program's Human Development Index (HDI). This is a measure of country-level well-being based on three different indicators, i.e., life expectancy, literacy and education, and standard of living. The standard of living component of the index is measured using per capita real GDP derived using PPPs. Various countries, including India, have made efforts to produce human development indexes for subregions within the country. Such attempts use PPPs to measure spatial price level differences explicitly or implicitly.

Price Competitiveness of Tourist Destinations

A more direct application of data generated from ICPs is by Dwyer and Rao, who used PPPs at the basic heading level to generate indexes of price competitiveness of different countries as tourist destinations.[42] Dwyer and Rao use weights derived from surveys conducted in destination countries. While their work focused mainly on Australia and its neighbors in Asia and the Pacific region, it is possible to extend their research to cover tourist destinations around the world. They use ICP results at the basic heading level and combine them with spending patterns of tourists.

40 Dowrick, S. and M. Akmal. 2005. Contradictory Trends In Global Income Inequality: A Tale Of Two Biases. Review of Income and Wealth 51 (2):201–229.

41 Afriat, S.N. 1967. The Construction of a Utility Function from Expenditure Data. *International Economic Review* 8(1):67–77.

42 Dwyer, F. and D.S.P. Rao. 2001. *PPPs and Price Competitiveness of International Tourism Destinations*. Paper presented at the International Seminar on the International Comparison Program organized jointly by the World Bank and OECD. January. Washington, D.C.

Lessons Learned and Future Directions

7

Introduction

Statistical capacity building has been an important benefit from the Update. ADB will continue its efforts to improve the synergies between the regional economies' statistical data collections and the data required for the ICP, particularly national accounts and prices. The ICP data collection software has improved since the 2005 ICP round and this is proving to be an important initiative in the 2011 ICP price collection. The Update has also been useful in providing a reasonably firm step-off point for the 2011 ICP.

Harmonizing the ICP and the Consumer Price Index

One of the outcomes from the 2005 ICP was that, ideally, the ICP requirements for prices data should be incorporated within CPI data collections to the extent possible. ADB has encouraged regional economies to incorporate as many products as possible from the ICP list in their CPIs, but with limited success so far. The Update has provided some extra impetus to this initiative, with the 2011 ICP also driving home the benefits of being able to extract ICP prices from the CPI. In particular, improvements in data quality have been observed, both in the CPI and ICP price data, in some economies that have made a concerted effort to integrate the collections.

Regional Prices Within an Economy

Shortcut methods were used to collect the prices for the Update. Apart from having a reduced product list compared with that in the 2005 ICP, the Update used prices collected only in the capital cities and then adjusted to national average prices on the basis of relationships observed in the 2005 ICP. While this procedure can be considered satisfactory for an update, it may not be suitable for a full benchmark round because the relationships between capital city prices and those for the rest of an economy are likely to change over time. In fact, an analysis using Philippine CPI data shows that these relationships do change, sometimes fairly quickly. However, the Philippine CPI case study[43] also showed that it may be possible to use regional CPI data to adjust capital city prices to a national average. The benefits of such an approach for the ICP would be substantially reduced costs in data collection.

Improving the Quality of Data Inputs for PPP Computation and CPIs

The software, developed at ADB, to facilitate data management at the economy and regional levels ensured the quality of data used in PPP computation, as the participating economies found the software quite easy to use, data validation was facilitated with data concerns being immediately addressed at the economy level. This was also applied to the CPI price data and has, therefore, resulted in better data inputs not only for PPPs but also for the regular national statistical series in some participating economies.

Applying PPP Concepts and Methodology at the Economy Level

Based on a study of CPI price data of five economies, it was found that CPI price observations and weights can be used to compute subnational PPPs for household final consumption expenditure. However, the CPI data

[43] ADB. 2011. Subnational Purchasing Power Parities toward Integration of International Comparison Program and Consumer Price Index: The Case of the Philippines. *ADB Economics Working Paper Series*. No. 290. Manila: ADB.

must have appropriate codes and details. In the same way that regular PPPs are used for assessing cross-country poverty, subnational PPPs can also be vital tools for studying subnational poverty differences and making informed policy decisions for poverty-related programs. This could also be used as a platform for advocating the use of PPP-based information at the economy level as there still seems to be a need to drum up appreciation on the uses of PPPs.

Updating National Accounts for Nonbenchmark Years

The Update also provided the stimulus for regional economies[44] to identify methods of updating expenditures on GDP at the detailed level, with some economies using the results of more recent household expenditures surveys or adopting the structures in the 2005 benchmark ICP. The efforts to use more firmly-based data for determining the distribution of major GDP aggregates is quite notable in a number of economies. The Update also drew on some of the data obtained from a related regional technical assistance on developing supply and use tables. The main aim was to improve the national accounts of ADB member economies through the data consistency processes embodied in the supply and use tables and the associated commodity-flow approach. An obvious spin-off was to improve the quality of the national accounts data supplied for the ICP.

44 Footnote 43.

Detailed Results 8

Detailed tables on the results of the 2009 PPP Update are found in this part of the publication. As the results were computed using the EKS method, real expenditures are not additive within a particular economy. The tables include GDP and its major aggregates of actual final consumption; collective consumption expenditure by general government; gross fixed capital formation; changes in inventories and net acquisitions of valuables; and, balance of exports and imports. The shares in the GDP within each economy and to Asia and the Pacific region are also presented.

The list of tables is as follows:

Table 24. Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups, 2009 (local currency units, billion)

Table 25. Purchasing Power Parities of Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups, 2009 (Hong Kong, China as base)

Table 26. Real Expenditures by Major Expenditure Aggregates, Categories, and Groups, 2009 (Hong Kong dollar, billion)

Table 27. Per Capita Real Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups, 2009 (Hong Kong dollar)

Table 28. Price Level Indexes: Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups, 2009 (Hong Kong, China = 100)

Table 29. Indexes of Per Capita Real Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups, 2009 (Asia = 100)

Table 30. Price Level Indexes of Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups, 2009 (Asia = 100)

Table 31. Percent Distribution of Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups and by Economy, 2009

Table 32. Shares of Each Economy to Asia's Real Expenditures, by Major Expenditure Aggregates, Categories, and Groups, 2009 (Asia = 100)

Table 24. Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups, 2009
(local currency units, billion)

EXPENDITURE CATEGORY/ECONOMY	BAN	BHU	BRU	CAM	PRC	FIJ	HKG
GROSS DOMESTIC PRODUCT	**6,536**	**61.28**	**15.60**	**43,287**	**34,632**	**5.55**	**1,622**
Actual Final Consumption[a]	**5,131**	**32.55**	**4.67**	**36,409**	**13,753**	**4.60**	**1,070**
Food and Nonalcoholic Beverages	2,587	12.19	0.81	16,751	3,086	1.21	114
Bread and Cereals	1,146	5.04	0.16	5,125	477	0.16	9.64
Meat and Fish	494	1.26	0.26	4,945	1,101	0.34	58.8
Fruits and Vegetables	350	1.66	0.13	2,404	720	0.19	13.64
Other Food and Nonalcoholic Beverages	597	4.23	0.25	4,276	788	0.51	32.38
Clothing and Footwear: of which	298	2.37	0.20	679	948	0.11	38.99
Clothing	265	1.92	0.17	352	726	0.06	27.94
Housing, Water, Electricity, Gas, and Other Fuels	883	5.50	0.54	4,670	1,915	1.19	186
Health and Education	492	5.35	1.09	5,079	2,443	0.59	168
Health	193	2.64	0.28	2,846	1,139	0.25	84.12
Education	299	2.71	0.82	2,234	1,303	0.34	84.09
Transportation and Communication: of which	242	0.81	0.95	2,780	1,302	0.37	95.90
Transportation	217	0.67	0.69	2,688	640	0.35	73.26
Recreation and Culture	36	0.90	0.36	901	605	0.23	108
Restaurants and Hotels	117	0.02	0.23	1,771	670	0.13	118
Other Consumption Expenditure Items	477	5.41	0.49	3,778	2,785	0.78	241
Collective Consumption Expenditure By General Government	**244**	**7.85**	**2.33**	**1,635**	**2,929**	**0.44**	**85.67**
Gross Fixed Capital Formation: of which	**1,640**	**25.30**	**2.83**	**5,104**	**15,668**	**1.42**	**323**
Machinery and Equipment	346	8.13	1.13	2,507	4,341	0.68	156
Construction	1,291	17.17	1.58	2,542	10,416	0.53	148
Change in Inventories and Net Acquisitions of Valuables	**–**	**–**	**0.00**	**235.27**	**778**	**0.06**	**22.91**
Balance of Exports and Imports	**–479**	**–4.42**	**5.78**	**–96.64**	**1,503**	**–0.97**	**121**
Household Final Consumption Expenditure	**5,022**	**27.32**	**3.73**	**34,342**	**12,113**	**4.20**	**1,012**
Government Final Consumption Expenditure	**354**	**13.08**	**3.26**	**3,702**	**4,569**	**0.84**	**143**
Actual Final Consumption[a]	**5,131**	**32.55**	**4.67**	**36,409**	**13,753**	**4.60**	**1,070**
All Goods	**3,780**	**22.02**	**1.93**	**24,524**	**7,133**	**2.25**	**330**
Nondurables	3,189	15.48	0.97	20,580	4,793	1.74	159
Semi-Durables	406	5.22	0.55	2,073	1,349	0.33	87
Durables	189	1.35	0.45	2,061	1,056	0.20	89
Services	**1,342**	**9.86**	**2.48**	**11,176**	**5,592**	**2.30**	**724**
Exchange Rate (LCU/HKG)	**8.91**	**6.25**	**0.19**	**534.11**	**0.88**	**0.25**	**1.00**
Population (in million)	**144.20**	**0.68**	**0.41**	**14.21**	**1,334.74**	**0.83**	**7.00**

LCU = local currency unit.
a Includes individual consumption expenditure by households, by non-profit institutions serving households, and by government.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China. The shares of the aggregates to GDP are not additive due to the use of the Eltetö-Köves-Szulc (EKS) aggregation method, which is not additive.

Table 24. Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups, 2009
(local currency units, billion) *continued*

IND	INO	LAO	MAL	MLD	MON	NEP	PAK	PHI	SIN	SRI	TAP	THA	VIE
61,484	**5,603,871**	**47,562**	**680**	**19**	**6,568**	**1,073**	**13,780**	**8,026**	**267**	**4,825**	**12,477**	**9,051**	**1,667,483**
37,619	**3,506,890**	**27,728**	**388**	**10**	**4,378**	**893**	**11,924**	**6,276**	**118**	**3,489**	**8,165**	**5,466**	**1,102,279**
10,850	1,544,601	11,893	64.0	2.33	1,539	490	5,017	2,936	8.82	1,237	962	1042	297,717
2,649	400,502	5,300	12.4	0.416	316	258	1,163	790	1.35	360	187	170	86,227
973	211,624	4,141	19.2	0.397	537	46	883	812	2.88	205	287	191	118,965
2,989	238,304	1,645	16.6	0.652	138	58	995	269	1.39	376	246	317	41,847
4,239	694,171	807	15.8	0.86	547	128	1,976	1,065	3.19	296	241	365	50,678
2,353	97,496	485	7.38	0.36	361	46	912	117	3.09	187	342	304	47,644
1,963	81,106	381	6.43	0.30	255	37	670	81	2.57	186	298	277	39,629
4,717	347,365	3,857	63.5	3.01	755	104	2,128	780	20.8	384	1,349	409	174,720
3,876	444,782	2,767	56.3	2.38	430	112	1,598	505	20.3	292	1,472	860	186,907
1,986	91,973	836	19.8	0.96	137	71	1,009	159	10.8	155	750	467	94,320
1,890	352,809	1,931	36.5	1.42	293	40	589	346	9.54	137	722	393	92,587
6,714	551,600	4,044	69.2	0.66	475	31	932	629	18.7	770	1,088	795	133,208
5,828	390,877	3,635	47.3	0.35	343	29	710	489	15.8	685	797	734	124,630
516	91,117	844	17.2	0.36	90	8	450	75	12.4	97	693	223	52,759
1,095	67,909	858	35.0	0.11	48	18	71	137	9.62	49	482	985	76,221
7,498	362,018	2,981	74.9	0.93	679	86	818	1,096	24.1	473	1,777	847	133,103
5,251	**321,731**	**5,533**	**47.2**	**2.50**	**404**	**76**	**387**	**509**	**20.9**	**466**	**1,033**	**712**	**104,540**
20,359	**1,744,381**	**15,065**	**137**	**10.09**	**1,904**	**228**	**2,290**	**1,526**	**76.1**	**1,147**	**2,356**	**2,208**	**572,526**
8,751	212,050	5,178	85.7	3.46	906	30	2,021	685	30.2	298	1,062	1,476	164,890
11,608	1,490,077	6,668	46.7	3.96	913	148	268	713	43.7	802	1,060	722	370,919
1,613	**–126,259**	**1,015**	**–38.4**	**–**	**361**	**114**	**220**	**–194**	**–4.08**	**36**	**–152**	**–290**	**59,800**
–3,358	**157,128**	**–1,778**	**146**	**–3.88**	**–478**	**–238**	**–1,041**	**–90**	**56.0**	**–314**	**1,076**	**955**	**–171,662**
35,637	**3,291,032**	**26,081**	**339**	**8.45**	**3,851**	**854**	**11,273**	**5,993**	**108**	**3,104**	**7,580**	**4,975**	**1,027,951**
7,233	**537,589**	**7,180**	**95.9**	**4.19**	**930**	**115**	**1,038**	**791**	**30**	**852**	**1,617**	**1,203**	**178,867**
37,619	**3,506,890**	**27,728**	**388**	**10.14**	**4,378**	**893**	**11,924**	**6,276**	**117.8**	**3,489**	**8,165**	**5,466**	**1,102,279**
21,878	**2,369,748**	**20,926**	**162**	**4.60**	**2,604**	**683**	**8,636**	**4,379**	**38.8**	**2,205**	**3,507**	**2,933**	**652,622**
14,763	1,855,852	15,771	90	3.32	1,860	595	6,848	3,899	15.7	1,548	1,524	1,752	448,098
6,025	315,045	2,261	40	0.79	609	61	1,355	340	8.62	348	1,075	831	93,179
1,123	208,814	2,963	35	0.59	163	30	471	173	15.2	315	940	389	119,534
15,181	**1,078,979**	**6,529**	**210**	**5.22**	**1,426**	**199**	**2,839**	**1,843**	**73.4**	**892**	**4,397**	**2,439**	**413,285**
6.25	**1,341**	**1,098.84**	**0.45**	**1.65**	**185.52**	**10.01**	**10.54**	**6.15**	**0.19**	**14.83**	**4.26**	**4.42**	**2,201.95**
1,165.94	**231.37**	**6.12**	**28.31**	**0.31**	**2.73**	**27.23**	**165.20**	**92.23**	**4.99**	**20.45**	**23.08**	**66.90**	**86.02**

Table 25. Purchasing Power Parities of Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups, 2009 (Hong Kong, China as base)

EXPENDITURE CATEGORY/ECONOMY	BAN	BHU	BRU	CAM	PRC	FIJ	HKG
GROSS DOMESTIC PRODUCT	**4.16**	**2.53**	**0.14**	**230**	**0.64**	**0.26**	**1.00**
Actual Final Consumption[a]	**3.69**	**2.40**	**0.14**	**219**	**0.58**	**0.23**	**1.00**
Food and Nonalcoholic Beverages	4.38	2.79	0.14	291	0.59	0.20	1.00
Bread and Cereals	4.52	2.54	0.11	245	0.48	0.16	1.00
Meat and Fish	4.70	2.98	0.15	355	0.61	0.21	1.00
Fruits and Vegetables	2.64	2.28	0.17	231	0.55	0.19	1.00
Other Food and Nonalcoholic Beverages	5.05	3.02	0.13	318	0.67	0.23	1.00
Clothing and Footwear: of which	5.53	3.73	0.21	317	1.67	0.22	1.00
Clothing	5.69	3.81	0.21	332	1.56	0.20	1.00
Housing, Water, Electricity, Gas, and Other Fuels	2.65	1.43	0.12	187	0.38	0.29	1.00
Health and Education	2.09	1.54	0.13	71.8	0.43	0.18	1.00
Health	2.38	1.70	0.13	110	0.39	0.16	1.00
Education	1.86	1.38	0.11	46.9	0.45	0.20	1.00
Transportation and Communication: of which	4.14	3.36	0.11	321	0.48	0.25	1.00
Transportation	5.39	3.71	0.12	360	0.56	0.30	1.00
Recreation and Culture	6.36	4.45	0.22	319	0.84	0.32	1.00
Restaurants and Hotels	4.55	3.17	0.17	287	0.84	0.30	1.00
Other Consumption Expenditure Items	3.91	2.71	0.14	228	0.73	0.23	1.00
Collective Consumption Expenditure By General Government	**4.21**	**1.65**	**0.11**	**115**	**0.48**	**0.19**	**1.00**
Gross Fixed Capital Formation: of which	**5.31**	**3.06**	**0.17**	**288**	**0.76**	**0.29**	**1.00**
Machinery and Equipment	9.83	6.33	0.22	547	1.22	0.35	1.00
Construction	3.29	1.72	0.13	161	0.50	0.24	1.00
Change in Inventories and Net Acquisitions of Valuables	**5.08**	**3.04**	**0.16**	**311**	**0.75**	**0.25**	**1.00**
Balance of Exports and Imports	**8.91**	**6.25**	**0.19**	**534**	**0.88**	**0.25**	**1.00**
Household Final Consumption Expenditure	**3.78**	**2.46**	**0.13**	**237**	**0.60**	**0.24**	**1.00**
Government Final Consumption Expenditure	**3.71**	**1.65**	**0.11**	**98.0**	**0.44**	**0.19**	**1.00**
Actual Final Consumption[a]	**3.69**	**2.40**	**0.14**	**219**	**0.58**	**0.23**	**1.00**
All Goods	**5.10**	**3.08**	**0.15**	**330**	**0.74**	**0.24**	**1.00**
Nondurables	4.11	2.45	0.14	284	0.56	0.20	1.00
Semi-Durables	5.52	3.72	0.15	356	1.27	0.22	1.00
Durables	10.42	5.43	0.18	449	1.07	0.46	1.00
Services	**2.69**	**2.01**	**0.13**	**140**	**0.48**	**0.26**	**1.00**

a Includes individual consumption expenditure by households, by non-profit institutions serving households, and by government.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China.

Table 25. Purchasing Power Parities of Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups, 2009 (Hong Kong, China as base) *continued*

IND	INO	LAO	MAL	MLD	MON	NEP	PAK	PHI	SIN	SRI	TAP	THA	VIE
2.70	**731**	**473**	**0.29**	**1.42**	**94.5**	**4.71**	**4.15**	**3.58**	**0.18**	**7.99**	**2.98**	**2.47**	**951**
2.29	**676**	**463**	**0.29**	**1.24**	**89.6**	**4.17**	**3.71**	**3.28**	**0.19**	**7.78**	**2.77**	**2.18**	**935**
2.48	743	650	0.30	1.19	100.7	4.44	5.40	3.68	0.17	9.23	3.16	2.45	1,207
2.19	658	730	0.30	0.87	121.7	3.88	5.94	2.92	0.17	8.42	3.30	2.48	1,026
2.80	756	607	0.29	1.00	78.8	5.33	5.73	3.57	0.20	10.56	3.29	2.32	1,496
2.00	528	466	0.33	1.73	140.6	3.95	3.61	4.79	0.16	7.79	2.84	2.14	975
2.75	915	703	0.27	1.20	116.4	4.98	5.60	3.98	0.16	9.71	3.03	2.68	1,244
2.87	927	785	0.50	1.62	135.9	5.05	4.41	5.32	0.24	7.21	3.25	2.70	1,419
2.96	979	799	0.58	1.70	135.6	5.52	4.66	5.55	0.24	7.53	3.44	2.88	1,480
1.62	428	249	0.26	2.29	81.1	3.11	1.88	2.26	0.22	4.02	2.67	1.20	706
1.32	485	135	0.23	0.55	37.8	2.33	1.99	2.61	0.18	3.61	2.00	1.59	367
1.14	629	209	0.24	0.74	45.9	2.49	2.05	3.12	0.18	5.15	1.73	1.81	489
1.62	400	95	0.21	0.41	31.4	2.20	1.99	2.20	0.16	2.63	2.28	1.39	278
2.79	798	803	0.23	1.00	94.7	7.10	3.94	3.52	0.16	12.85	2.53	2.50	1,309
3.44	855	888	0.25	1.44	120.7	8.57	5.19	3.34	0.20	15.99	2.96	2.78	1,561
2.96	998	990	0.44	1.57	170.8	6.54	7.43	5.77	0.21	13.37	3.50	3.76	1,574
3.34	888	558	0.33	1.83	183.6	5.74	5.46	3.49	0.16	11.64	3.02	2.22	1,233
2.89	789	575	0.33	1.12	111.5	5.19	4.10	3.28	0.21	9.74	3.03	2.81	1,105
2.69	**769**	**220**	**0.22**	**0.89**	**59.6**	**4.88**	**3.34**	**3.34**	**0.15**	**4.14**	**2.53**	**2.34**	**522**
3.61	**779**	**601**	**0.29**	**1.73**	**111.7**	**6.67**	**6.34**	**4.32**	**0.19**	**10.11**	**3.40**	**3.02**	**1,093**
5.98	1,142	1,025	0.39	1.70	182.4	10.56	11.38	6.24	0.25	15.00	3.66	4.64	2,019
2.28	533	369	0.21	1.67	70.7	4.42	2.95	3.05	0.14	6.91	3.07	1.99	657
3.18	**817**	**651**	**0.31**	**1.53**	**113.9**	**5.66**	**5.30**	**4.20**	**0.20**	**9.98**	**3.20**	**2.99**	**1,209**
6.25	**1,341**	**1,099**	**0.45**	**1.65**	**185.5**	**10.01**	**10.54**	**6.15**	**0.19**	**14.83**	**4.26**	**4.42**	**2,202**
2.32	**688**	**515**	**0.29**	**1.32**	**93.5**	**4.27**	**3.83**	**3.33**	**0.19**	**8.23**	**2.80**	**2.21**	**1,001**
2.40	**668**	**197**	**0.22**	**0.81**	**56.6**	**4.20**	**2.85**	**3.11**	**0.15**	**4.13**	**2.44**	**2.10**	**475**
2.29	**676**	**463**	**0.29**	**1.24**	**89.6**	**4.17**	**3.71**	**3.28**	**0.19**	**7.78**	**2.77**	**2.18**	**935**
2.95	**865**	**704**	**0.34**	**1.37**	**117.5**	**5.58**	**5.24**	**4.25**	**0.21**	**10.25**	**3.10**	**3.01**	**1,350**
2.35	742	549	0.29	1.20	93.5	4.41	4.61	3.60	0.20	8.70	2.85	2.55	1,108
3.43	754	879	0.34	1.46	144.1	6.02	4.67	4.59	0.22	9.18	3.03	3.12	1,399
5.03	1,632	1,319	0.49	2.09	219.5	13.51	7.45	5.94	0.24	18.43	3.94	4.56	2,368
1.90	**554**	**280**	**0.26**	**1.25**	**71.1**	**3.29**	**2.52**	**2.64**	**0.18**	**6.45**	**2.64**	**1.61**	**660**

Table 26. Real Expenditures by Major Expenditure Aggregates, Categories, and Groups,[a] 2009 (Hong Kong dollar, billion)

EXPENDITURE CATEGORY/ECONOMY	BAN	BHU	BRU	CAM	PRC	FIJ	HKG
GROSS DOMESTIC PRODUCT	**1,570**	**24.2**	**111.98**	**188**	**54,335**	**21.12**	**1,622**
Actual Final Consumption[b]	**1,390**	**13.6**	**34.38**	**166**	**23,573**	**19.60**	**1,070**
Food and Nonalcoholic Beverages	590	4.37	5.86	57.5	5,274	6.05	114.4
Bread and Cereals	253	1.98	1.41	20.9	996	1.02	9.64
Meat and Fish	105	0.42	1.72	13.9	1,816	1.64	58.8
Fruits and Vegetables	133	0.73	0.78	10.4	1,301	1.03	13.6
Other Food and Nonalcoholic Beverages	118	1.40	1.98	13.4	1,180	2.26	32.4
Clothing and Footwear: of which	54	0.64	0.97	2.14	568	0.50	39.0
Clothing	46	0.50	0.82	1.06	466	0.29	27.9
Housing, Water, Electricity, Gas, and Other Fuels	333	3.83	4.68	25.0	5,081	4.11	186
Health and Education	236	3.46	8.65	70.6	5,616	3.22	168
Health	81	1.56	2.06	25.9	2,891	1.60	84.1
Education	160	1.96	7.31	47.5	2,886	1.70	84.1
Transportation and Communication: of which	58	0.24	8.54	8.67	2,737	1.45	95.9
Transportation	40	0.18	5.85	7.47	1,145	1.17	73.3
Recreation and Culture	6	0.20	1.61	2.82	723	0.70	108
Restaurants and Hotels	26	0.01	1.36	6.17	799	0.43	118
Other Consumption Expenditure Items	122	2.00	3.37	16.6	3,816	3.44	241
Collective Consumption Expenditure By General Government	**58**	**4.75**	**22.10**	**14.2**	**6,110**	**2.27**	**85.7**
Gross Fixed Capital Formation: of which	**309**	**8.27**	**16.79**	**17.7**	**20,528**	**4.94**	**323**
Machinery and Equipment	35	1.28	5.07	4.58	3,570	1.97	156
Construction	393	9.99	12.50	15.81	20,735	2.22	148
Change in Inventories and Net Acquisitions of Valuables	**–**	**0.00**	**0.01**	**0.76**	**1,037**	**0.24**	**22.9**
Balance of Exports and Imports	**–54**	**–0.71**	**30.87**	**–0.18**	**1,706**	**–3.85**	**121**
Household Final Consumption Expenditure	**1,330**	**11.11**	**27.97**	**145**	**20,115**	**17.60**	**1,012**
Government Final Consumption Expenditure	**95**	**7.90**	**29.52**	**37.7**	**10,418**	**4.42**	**143**
Actual Final Consumption[b]	**1,390**	**13.6**	**34.38**	**166**	**23,573**	**19.6**	**1,070**
All Goods	**741**	**7.14**	**12.84**	**74.3**	**9,681**	**9.43**	**330**
Nondurables	777	6.32	6.72	72.5	8,534	8.81	159
Semi-Durables	74	1.40	3.64	5.83	1,064	1.51	87
Durables	18	0.25	2.50	4.59	990	0.42	89
Services	**499**	**4.89**	**19.30**	**79.9**	**11,696**	**8.82**	**724**

a Real refers to purchasing power parity-adjusted values.
b Includes individual consumption expenditure by households, by non-profit institutions serving households, and by government.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China.

Table 26. Real Expenditures by Major Expenditure Aggregates, Categories, and Groups,[a] 2009 (Hong Kong dollar, billion)
continued

IND	INO	LAO	MAL	MLD	MON	NEP	PAK	PHI	SIN	SRI	TAP	THA	VIE
23,096	**7,666**	**100**	**2,336**	**13.29**	**69.5**	**228**	**3,320**	**2,240**	**1,498**	**604**	**4,165**	**3,662**	**1,771**
16,586	**5,186**	**59.9**	**1,337**	**8.19**	**48.9**	**214**	**3,216**	**1,915**	**623**	**448**	**2,945**	**2,506**	**1,188**
4,380	2,080	18.3	213	1.96	15.28	110.4	929	799	51	134	304	426	247
1,207	608	7.26	40.7	0.48	2.59	66.5	196	270	8	43	56.6	68.4	84.1
347	280	6.82	65.8	0.40	6.82	8.73	154	228	15	19	87.3	82.1	79.5
1,494	451	3.53	50.9	0.38	0.98	14.57	276	56.3	9	48	86.8	148	42.9
1,541	759	1.15	57.9	0.72	4.70	25.7	353	268	20	30	79.4	136	40.7
821	105	0.62	14.7	0.22	2.66	9.06	207	22.0	13	26	105	113	33.6
663	83	0.48	11.1	0.18	1.88	6.74	144	14.6	11	25	86.5	96.2	26.8
2,914	811	15.5	240	1.32	9.31	33.3	1,132	345	94	96	506	342	248
3,156	917	20.4	245	4.35	11.4	47.8	804	193	115	81	734	539	526
1,791	146.2	4.01	81.3	1.29	2.99	28.7	493	51.1	58	30	427	258	196
1,333	881	20.2	173	3.41	9.29	18.2	296	157	58	52	316	281	351
2,408	691	5.04	295	0.66	5.01	4.40	236	179	115	60	429	318	102
1,696	457	4.09	187	0.24	2.84	3.39	137	146	79	43	269	264	79.8
174	91.3	0.85	39.1	0.23	0.53	1.23	60.5	12.9	59	7	198	59.4	33.5
328	76	1.54	107	0.06	0.26	3.09	13.0	39.3	60	4	159	444	61.8
2,597	459	5.18	224	0.83	6.09	16.5	199	334	112	49	587	302	120
2,165	**418**	**25.1**	**219**	**2.80**	**6.76**	**15.47**	**116**	**152**	**143**	**112**	**383**	**304**	**215**
5,637	**2,239**	**25.1**	**479**	**5.82**	**17.05**	**34.2**	**361**	**353**	**404**	**113**	**694**	**732**	**524**
1,464	186	5.05	218	2.04	4.96	2.86	178	110	123	20	290	318	82
5,086	2,794	18.1	218	2.37	12.92	33.5	91	233	306	116	345	363	564
507	**–154**	**1.56**	**–122**	**–**	**3.17**	**20.11**	**41.6**	**–46.3**	**–21**	**4**	**–48**	**–96.9**	**49.5**
–538	**117**	**–1.62**	**322**	**–2.35**	**–2.58**	**–23.8**	**–98.7**	**–14.7**	**299**	**–21**	**252**	**216**	**–78.0**
15,348	**4,784**	**50.7**	**1,151**	**6.42**	**41.2**	**200**	**2,942**	**1,799**	**570**	**377**	**2,708**	**2,248**	**1,027**
3,384	**803**	**36.5**	**435**	**5.18**	**16.4**	**27.4**	**364**	**254**	**198**	**206**	**635**	**572**	**403**
16,586	**5,186**	**59.9**	**1,337**	**8.19**	**48.9**	**214**	**3,216**	**1,915**	**623**	**448**	**2,945**	**2,506**	**1,188**
7,423	**2,740**	**29.7**	**478**	**3.37**	**22.2**	**122.3**	**1,650**	**1,031**	**189**	**215**	**1,132**	**974**	**483**
6,281	2,500	28.7	308	2.76	19.9	134.9	1,485	1,082	78	178	535	687	405
1,757	418	2.57	117	0.54	4.23	10.20	290	74.0	40	37.9	354	266	66.6
223	128	2.25	70.9	0.28	0.74	2.24	63.24	29.2	62	17	239	85.4	50.5
8,196	**1,948**	**23.3**	**803**	**4.18**	**20.1**	**60.6**	**1,127**	**698**	**414**	**138**	**1,663**	**1,514**	**636**

Table 27. Per Capita Real Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups,[a] 2009
(Hong Kong dollar)

EXPENDITURE CATEGORY/ECONOMY	BAN	BHU	BRU	CAM	PRC	FIJ	HKG	IND
GROSS DOMESTIC PRODUCT	**10,888**	**35,430**	**275,712**	**13,260**	**40,706**	**25,343**	**231,611**	**19,500**
Actual Final Consumption[b]	**9,640**	**19,859**	**84,682**	**11,719**	**17,659**	**23,512**	**152,707**	**14,069**
Food and Nonalcoholic Beverages	4,094	6,396	14,437	4,049	3,951	7,249	16,340	3,757
Bread and Cereals	1,758	2,895	3,464	1,470	746	1,219	1,377	1,035
Meat and Fish	729	618	4,237	980	1,361	1,972	8,392	298
Fruits and Vegetables	919	1,065	1,931	734	975	1,237	1,948	1,282
Other Food and Nonalcoholic Beverages	820	2,052	4,881	946	884	2,709	4,623	1,321
Clothing and Footwear: of which	373	930	2,378	151	425	597	5,566	704
Clothing	322	738	2,018	75	349	351	3,990	568
Housing, Water, Electricity, Gas, and Other Fuels	2,313	5,608	11,533	1,761	3,807	4,929	26,520	2,499
Health and Education	1,636	5,077	21,354	4,976	4,209	3,877	24,018	2,515
Health	562	2,278	5,058	1,821	2,164	1,920	12,011	1,498
Education	1,112	2,883	18,088	3,353	2,164	2,053	12,007	1,000
Transportation and Communication: of which	405	354	21,014	610	2,051	1,736	13,693	2,065
Transportation	279	264	14,391	526	858	1,406	10,459	1,454
Recreation and Culture	39	298	3,973	199	542	842	15,421	150
Restaurants and Hotels	179	11	3,360	434	598	517	16,805	281
Other Consumption Expenditure Items	846	2,920	8,286	1,168	2,859	4,121	34,345	2,227
Collective Consumption Expenditure By General Government	**402**	**6,958**	**54,434**	**999**	**4,581**	**2,721**	**12,232**	**1,675**
Gross Fixed Capital Formation: of which	**2,143**	**12,101**	**41,344**	**1,247**	**15,379**	**5,927**	**46,079**	**4,835**
Machinery and Equipment	244	1,879	12,477	323	2,675	2,362	22,292	1,256
Construction	2,723	14,611	30,777	1,113	15,535	2,659	21,135	4,363
Change in Inventories and Net Acquisitions of Valuables	**–**	**–**	**19**	**53**	**777**	**291**	**3,271**	**435**
Balance of Exports and Imports	**–373**	**–1,036**	**75,991**	**–13**	**1,278**	**–4,616**	**17,323**	**–461**
Household Final Consumption Expenditure	**9,223**	**16,250**	**68,859**	**10,183**	**15,070**	**21,102**	**144,543**	**13,163**
Government Final Consumption Expenditure	**661**	**11,570**	**72,754**	**2,658**	**7,804**	**5,318**	**20,396**	**2,580**
Actual Final Consumption[b]	**9,640**	**19,859**	**84,682**	**11,719**	**17,659**	**23,512**	**152,707**	**14,069**
All Goods	5,140	10,445	31,605	5,229	7,253	11,306	47,115	6,366
Nondurables	5,387	9,252	16,548	5,101	6,394	10,565	22,743	5,387
Semi-Durables	510	2,053	8,969	410	797	1,805	12,478	1,507
Durables	126	363	6,150	323	742	510	12,679	191
Services	**3,459**	**7,163**	**47,568**	**5,627**	**8,763**	**10,583**	**103,364**	**6,836**

a Real refers to purchasing power parity-adjusted values.
b Includes individual consumption expenditure by households, by non-profit institutions serving households, and by government.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China.

Table 27. Per Capita Real Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups,[a] 2009
(Hong Kong dollar) *continued*

INO	LAO	MAL	MLD	MON	NEP	PAK	PHI	SIN	SRI	TAP	THA	VIE
33,141	**16,424**	**82,524**	**42,274**	**25,461**	**8,378**	**20,092**	**24,292**	**300,426**	**29,537**	**181,595**	**54,753**	**20,389**
22,414	**9,786**	**47,225**	**26,060**	**17,895**	**7,861**	**19,459**	**20,761**	**124,981**	**21,916**	**127,706**	**37,459**	**13,710**
8,990	2,992	7,539	6,216	5,599	4,056	5,624	8,659	10,186	6,555	13,175	6,368	2,868
2,629	1,187	1,439	1,518	950	2,444	1,184	2,933	1,561	2,088	2,453	1,022	977
1,210	1,115	2,326	1,260	2,498	321	932	2,470	2,951	949	3,785	1,228	924
1,949	577	1,799	1,201	359	535	1,668	610	1,749	2,362	3,763	2,210	499
3,280	187	2,047	2,285	1,723	944	2,135	2,902	3,975	1,489	3,440	2,033	474
455	101	520	705	974	333	1,252	239	2,554	1,272	4,560	1,685	390
358	78	393	566	688	248	870	158	2,127	1,208	3,749	1,438	311
3,505	2,536	8,477	4,190	3,411	1,222	6,849	3,737	18,814	4,672	21,936	5,105	2,878
3,967	3,348	8,656	13,864	4,168	1,755	4,866	2,097	23,157	3,956	31,962	8,081	5,921
632	655	2,870	4,088	1,095	1,054	2,980	554	11,731	1,476	18,744	3,848	2,242
3,817	3,312	6,145	10,909	3,413	670	1,790	1,706	11,749	2,544	13,750	4,226	3,878
2,988	823	10,433	2,094	1,837	162	1,430	1,941	22,961	2,928	18,598	4,752	1,183
1,976	669	6,605	765	1,040	125	828	1,587	15,793	2,095	11,645	3,951	928
395	139	1,382	724	194	45	366	140	11,773	354	8,582	887	390
330	251	3,782	193	96	113	79	426	12,060	206	6,908	6,637	719
1,982	847	7,913	2,641	2,232	605	1,207	3,620	22,526	2,376	25,434	4,509	1,400
1,809	**4,100**	**7,743**	**8,896**	**2,481**	**569**	**701**	**1,652**	**28,589**	**5,504**	**17,678**	**4,557**	**2,329**
9,676	**4,099**	**16,920**	**18,518**	**6,244**	**1,258**	**2,184**	**3,829**	**80,945**	**5,548**	**30,063**	**10,947**	**6,090**
802	825	7,695	6,471	1,819	105	1,076	1,192	24,632	971	12,557	4,759	949
12,077	2,949	7,691	7,545	4,731	1,230	550	2,532	61,438	5,680	14,937	5,419	6,559
–668	**255**	**–4,326**	**–**	**1,162**	**738**	**252**	**–502**	**–4,123**	**177**	**–2,061**	**–1,448**	**575**
507	**–264**	**11,386**	**–7,463**	**–944**	**–873**	**–598**	**–159**	**59,982**	**–1,035**	**10,937**	**3,225**	**–906**
20,678	**8,281**	**40,675**	**20,396**	**15,093**	**7,344**	**17,806**	**19,506**	**114,366**	**18,437**	**117,333**	**33,594**	**11,943**
3,478	**5,969**	**15,377**	**16,500**	**6,018**	**1,008**	**2,202**	**2,757**	**39,879**	**10,084**	**28,685**	**8,567**	**4,378**
22,414	**9,786**	**47,225**	**26,060**	**17,895**	**7,861**	**19,459**	**20,761**	**124,981**	**21,916**	**127,706**	**37,459**	**13,710**
11,844	4,858	16,893	10,707	8,114	4,494	9,986	11,179	37,856	10,522	49,043	14,566	5,618
10,804	4,696	10,883	8,770	7,286	4,953	8,987	11,729	15,724	8,707	23,172	10,261	4,702
1,805	420	4,146	1,729	1,549	375	1,757	803	8,028	1,854	15,352	3,983	774
553	367	2,505	890	272	82	383	316	12,527	835	10,347	1,276	587
8,425	**3,813**	**28,370**	**13,313**	**7,349**	**2,228**	**6,819**	**7,577**	**83,148**	**6,765**	**72,213**	**22,654**	**7,279**

Table 28. Price Level Indexes: Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups, 2009 (Hong Kong, China = 100)

EXPENDITURE CATEGORY/ECONOMY	BAN	BHU	BRU	CAM	PRC	FIJ	HKG
GROSS DOMESTIC PRODUCT	**47**	**41**	**74**	**43**	**72**	**104**	**100**
Actual Final Consumption[a]	**41**	**38**	**72**	**41**	**66**	**93**	**100**
Food and Nonalcoholic Beverages	49	45	74	55	66	79	100
Bread and Cereals	51	41	61	46	54	63	100
Meat and Fish	53	48	82	66	69	82	100
Fruits and Vegetables	30	37	90	43	63	74	100
Other Food and Nonalcoholic Beverages	57	48	69	60	76	89	100
Clothing and Footwear: of which	62	60	110	59	189	86	100
Clothing	64	61	112	62	177	80	100
Housing, Water, Electricity, Gas, and Other Fuels	30	23	61	35	43	114	100
Health and Education	23	25	67	13	49	72	100
Health	27	27	72	21	45	63	100
Education	21	22	60	9	51	78	100
Transportation and Communication: of which	46	54	59	60	54	101	100
Transportation	61	59	63	67	63	118	100
Recreation and Culture	71	71	118	60	95	128	100
Restaurants and Hotels	51	51	92	54	95	120	100
Other Consumption Expenditure Items	44	43	77	43	83	90	100
Collective Consumption Expenditure By General Government	**47**	**26**	**56**	**22**	**54**	**77**	**100**
Gross Fixed Capital Formation: of which	**60**	**49**	**90**	**54**	**87**	**113**	**100**
Machinery and Equipment	110	101	119	102	138	137	100
Construction	37	28	67	30	57	95	100
Change in Inventories and Net Acquisitions of Valuables	**57**	**49**	**85**	**58**	**85**	**100**	**100**
Balance of Exports and Imports	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Household Final Consumption Expenditure	**42**	**39**	**71**	**44**	**68**	**94**	**100**
Government Final Consumption Expenditure	**42**	**26**	**59**	**18**	**50**	**75**	**100**
Actual Final Consumption[a]	**41**	**38**	**72**	**41**	**66**	**93**	**100**
All Goods	**57**	**49**	**80**	**62**	**84**	**94**	**100**
Nondurables	46	39	77	53	64	78	100
Semi-Durables	62	60	80	67	144	86	100
Durables	117	87	97	84	121	181	100
Services	**30**	**32**	**69**	**26**	**54**	**103**	**100**

a Includes individual consumption expenditure by households, by non-profit institutions serving households, and by government.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China.

Table 28. Price Level Indexes: Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups, 2009 (Hong Kong, China = 100) *continued*

IND	INO	LAO	MAL	MLD	MON	NEP	PAK	PHI	SIN	SRI	TAP	THA	VIE
43	**55**	**43**	**64**	**86**	**51**	**47**	**39**	**58**	**95**	**54**	**70**	**56**	**43**
37	**50**	**42**	**64**	**75**	**48**	**42**	**35**	**53**	**101**	**52**	**65**	**49**	**42**
40	55	59	66	72	54	44	51	60	93	62	74	55	55
35	49	66	67	53	66	39	56	47	93	57	77	56	47
45	56	55	64	61	42	53	54	58	105	71	77	52	68
32	39	42	72	105	76	39	34	78	85	53	67	48	44
44	68	64	60	73	63	50	53	65	86	65	71	61	56
46	69	71	110	98	73	51	42	86	130	49	76	61	64
47	73	73	127	103	73	55	44	90	130	51	81	65	67
26	32	23	58	138	44	31	18	37	118	27	63	27	32
21	36	12	51	33	20	23	19	42	94	24	47	36	17
18	47	19	54	45	25	25	19	51	99	35	41	41	22
26	30	9	46	25	17	22	19	36	87	18	53	31	13
45	60	73	52	61	51	71	37	57	87	87	59	57	59
55	64	81	56	87	65	86	49	54	107	108	69	63	71
47	74	90	97	95	92	65	70	94	112	90	82	85	71
53	66	51	72	111	99	57	52	57	85	78	71	50	56
46	59	52	74	68	60	52	39	53	115	66	71	63	50
43	**57**	**20**	**47**	**54**	**32**	**49**	**32**	**54**	**79**	**28**	**59**	**53**	**24**
58	**58**	**55**	**63**	**105**	**60**	**67**	**60**	**70**	**101**	**68**	**80**	**68**	**50**
96	85	93	87	103	98	105	108	101	131	101	86	105	92
37	40	34	47	101	38	44	28	50	76	47	72	45	30
51	**61**	**59**	**69**	**92**	**61**	**57**	**50**	**68**	**106**	**67**	**75**	**68**	**55**
100	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
37	**51**	**47**	**65**	**80**	**50**	**43**	**36**	**54**	**101**	**55**	**66**	**50**	**45**
38	**50**	**18**	**49**	**49**	**31**	**42**	**27**	**51**	**82**	**28**	**57**	**47**	**22**
37	**50**	**42**	**64**	**75**	**48**	**42**	**35**	**53**	**101**	**52**	**65**	**49**	**42**
47	**65**	**64**	**75**	**83**	**63**	**56**	**50**	**69**	**110**	**69**	**73**	**68**	**61**
38	55	50	64	73	50	44	44	59	107	59	67	58	50
55	56	80	76	88	78	60	44	75	115	62	71	70	64
81	122	120	107	127	118	135	71	97	130	124	92	103	108
30	**41**	**25**	**58**	**76**	**38**	**33**	**24**	**43**	**95**	**43**	**62**	**36**	**30**

Table 29. Indexes of Per Capita Real Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups,[a] 2009 (Asia = 100)

EXPENDITURE CATEGORY/ECONOMY	BAN	BHU	BRU	CAM	PRC	FIJ	HKG
GROSS DOMESTIC PRODUCT	**33**	**108**	**843**	**41**	**124**	**77**	**708**
Actual Final Consumption[b]	**52**	**106**	**453**	**63**	**95**	**126**	**818**
Food and Nonalcoholic Beverages	89	139	313	88	86	157	354
Bread and Cereals	154	253	303	129	65	107	120
Meat and Fish	74	62	428	99	137	199	848
Fruits and Vegetables	75	87	159	60	80	102	160
Other Food and Nonalcoholic Beverages	60	149	355	69	64	197	337
Clothing and Footwear: of which	58	145	370	23	66	93	866
Clothing	63	144	394	15	68	69	779
Housing, Water, Electricity, Gas, and Other Fuels	60	146	301	46	99	129	692
Health and Education	41	129	541	126	107	98	608
Health	28	115	256	92	109	97	607
Education	54	140	878	163	105	100	582
Transportation and Communication: of which	16	14	848	25	83	70	552
Transportation	20	19	1,014	37	60	99	737
Recreation and Culture	8	64	855	43	117	181	3,319
Restaurants and Hotels	28	2	518	67	92	80	2,589
Other Consumption Expenditure Items	31	108	305	43	105	152	1,266
Collective Consumption Expenditure By General Government	**13**	**217**	**1,696**	**31**	**143**	**85**	**381**
Gross Fixed Capital Formation: of which	**22**	**125**	**426**	**13**	**158**	**61**	**474**
Machinery and Equipment	12	93	620	16	133	117	1,108
Construction	29	157	331	12	167	29	227
Change in Inventories and Net Acquisitions of Valuables	**–**	**–**	**3**	**10**	**142**	**53**	**596**
Balance of Exports and Imports	**–50**	**–138**	**10,154**	**–2**	**171**	**–617**	**2,315**
Household Final Consumption Expenditure	**55**	**97**	**411**	**61**	**90**	**126**	**863**
Government Final Consumption Expenditure	**12**	**210**	**1,321**	**48**	**142**	**96**	**371**
Actual Final Consumption[b]	**52**	**106**	**453**	**63**	**95**	**126**	**818**
All Goods	**63**	**129**	**389**	**64**	**89**	**139**	**580**
Nondurables	78	134	240	74	93	153	330
Semi-Durables	36	146	640	29	57	129	890
Durables	20	58	985	52	119	82	2,030
Services	**38**	**79**	**523**	**62**	**96**	**116**	**1,136**

a Real refers to purchasing power parity-adjusted values.
b Includes individual consumption expenditure by households, by non-profit institutions serving households, and by government.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. For consistency and comparability with the 2005 PPP benchmarks, Asia refers to the 21 participating economies in the 2009 PPP Update in Asia and the Pacific, and the Islamic Republic of Iran and Macao, China. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China. The shares of the aggregates to GDP are not additive due to the use of the Eltetö-Köves-Szulc (EKS) aggregation method, which is not additive.

Table 29. Indexes of Per Capita Real Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups,[a] 2009 (Asia = 100) *continued*

IND	INO	LAO	MAL	MLD	MON	NEP	PAK	PHI	SIN	SRI	TAP	THA	VIE
60	**101**	**50**	**252**	**129**	**78**	**26**	**61**	**74**	**919**	**90**	**555**	**167**	**62**
75	**120**	**52**	**253**	**140**	**96**	**42**	**104**	**111**	**669**	**117**	**684**	**201**	**73**
82	195	65	164	135	121	88	122	188	221	142	286	138	62
91	230	104	126	133	83	214	104	257	137	183	215	89	86
30	122	113	235	127	252	32	94	250	298	96	382	124	93
105	160	47	148	99	30	44	137	50	144	194	309	181	41
96	239	14	149	166	125	69	155	211	289	108	250	148	34
110	71	16	81	110	152	52	195	37	397	198	709	262	61
111	70	15	77	110	134	48	170	31	415	236	732	281	61
65	92	66	221	109	89	32	179	98	491	122	573	133	75
64	100	85	219	351	106	44	123	53	586	100	809	205	150
76	32	33	145	207	55	53	151	28	593	75	948	195	113
48	185	161	298	529	166	32	87	83	570	123	667	205	188
83	121	33	421	84	74	7	58	78	926	118	750	192	48
103	139	47	466	54	73	9	58	112	1,113	148	821	279	65
32	85	30	297	156	42	10	79	30	2,534	76	1,847	191	84
43	51	39	583	30	15	17	12	66	1,858	32	1,064	1,023	111
82	73	31	292	97	82	22	44	133	830	88	938	166	52
52	**56**	**128**	**241**	**277**	**77**	**18**	**22**	**51**	**891**	**172**	**551**	**142**	**73**
50	**100**	**42**	**174**	**191**	**64**	**13**	**22**	**39**	**834**	**57**	**310**	**113**	**63**
62	40	41	382	322	90	5	53	59	1,224	48	624	237	47
47	130	32	83	81	51	13	6	27	660	61	160	58	70
79	**–122**	**46**	**–789**	**–**	**212**	**135**	**46**	**–92**	**–752**	**32**	**–376**	**–264**	**105**
–62	**68**	**–35**	**1,521**	**–997**	**–126**	**–117**	**–80**	**–21**	**8,015**	**–138**	**1,461**	**431**	**–121**
79	**123**	**49**	**243**	**122**	**90**	**44**	**106**	**116**	**683**	**110**	**701**	**201**	**71**
48	**64**	**111**	**285**	**306**	**112**	**19**	**41**	**51**	**739**	**187**	**532**	**159**	**81**
75	**120**	**52**	**253**	**140**	**96**	**42**	**104**	**111**	**669**	**117**	**684**	**201**	**73**
78	**146**	**60**	**208**	**132**	**100**	**55**	**123**	**138**	**466**	**130**	**604**	**179**	**69**
78	157	68	158	127	106	72	130	170	228	126	336	149	68
107	129	30	296	123	110	27	125	57	572	132	1,095	284	55
31	89	59	401	143	43	13	61	51	2,006	134	1,657	204	94
75	**93**	**42**	**312**	**146**	**81**	**24**	**75**	**83**	**914**	**74**	**794**	**249**	**80**

Table 30. Price Level Indexes of Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups, 2009 (Asia = 100)

EXPENDITURE CATEGORY/ECONOMY	BAN	BHU	BRU	CAM	PRC	FIJ	HKG
GROSS DOMESTIC PRODUCT	**76**	**66**	**121**	**70**	**117**	**169**	**162**
Actual Final Consumption[a]	**78**	**72**	**136**	**77**	**124**	**174**	**188**
Food and Nonalcoholic Beverages	88	80	132	98	119	142	179
Bread and Cereals	106	85	126	96	113	131	208
Meat and Fish	82	74	128	104	107	128	156
Fruits and Vegetables	64	79	196	94	136	161	217
Other Food and Nonalcoholic Beverages	94	80	114	99	126	148	166
Clothing and Footwear: of which	70	67	124	67	214	97	113
Clothing	72	69	126	70	200	90	113
Housing, Water, Electricity, Gas, and Other Fuels	81	62	167	95	116	311	272
Health and Education	62	65	178	35	130	191	263
Health	76	77	202	58	127	177	283
Education	54	57	154	23	132	202	258
Transportation and Communication: of which	94	109	121	122	110	204	203
Transportation	101	99	105	112	105	196	166
Recreation and Culture	83	83	138	70	111	150	117
Restaurants and Hotels	69	69	124	73	129	163	136
Other Consumption Expenditure Items	66	65	116	64	124	134	150
Collective Consumption Expenditure By General Government	**95**	**53**	**113**	**44**	**110**	**155**	**202**
Gross Fixed Capital Formation: of which	**77**	**64**	**117**	**70**	**113**	**147**	**130**
Machinery and Equipment	93	86	101	87	117	116	85
Construction	72	54	132	59	112	186	196
Change in Inventories and Net Acquisitions of Valuables	**85**	**73**	**128**	**87**	**127**	**149**	**150**
Balance of Exports and Imports	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Household Final Consumption Expenditure	**78**	**73**	**132**	**82**	**126**	**174**	**185**
Government Final Consumption Expenditure	**91**	**58**	**129**	**40**	**109**	**164**	**218**
Actual Final Consumption[a]	**78**	**72**	**136**	**77**	**124**	**174**	**188**
All Goods	**86**	**74**	**121**	**93**	**126**	**142**	**150**
Nondurables	87	74	145	100	120	147	188
Semi-Durables	80	76	103	85	185	110	128
Durables	107	79	89	77	111	166	91
Services	**67**	**72**	**152**	**58**	**121**	**229**	**222**

a Includes individual consumption expenditure by households, by non-profit institutions serving households, and by government.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. For consistency and comparability with the 2005 PPP benchmarks, Asia refers to the 21 participating economies in the 2009 PPP Update in Asia and the Pacific, and the Islamic Republic of Iran and Macao, China. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China.

Table 30. Price Level Indexes of Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups, 2009 (Asia = 100) *continued*

IND	INO	LAO	MAL	MLD	MON	NEP	PAK	PHI	SIN	SRI	TAP	THA	VIE
70	**89**	**70**	**104**	**139**	**83**	**76**	**64**	**95**	**155**	**87**	**113**	**91**	**70**
69	**95**	**79**	**120**	**141**	**91**	**78**	**66**	**100**	**189**	**98**	**122**	**92**	**80**
71	99	106	118	129	97	79	92	107	166	111	133	99	98
73	102	138	139	110	137	81	117	99	193	118	161	117	97
70	88	86	100	94	66	83	85	90	163	111	120	82	106
70	86	92	155	227	165	86	74	169	185	114	144	105	96
73	113	106	100	121	104	83	88	107	143	109	118	101	94
52	78	81	124	111	83	57	47	97	146	55	86	69	73
54	83	82	144	116	83	62	50	102	147	57	91	74	76
71	87	62	159	377	119	85	49	100	322	74	170	74	87
56	95	32	133	87	54	61	50	112	248	64	123	95	44
52	133	54	152	128	70	70	55	144	279	98	115	116	63
67	77	22	119	65	44	57	49	92	224	46	137	81	32
91	121	149	105	124	104	144	76	116	177	176	121	115	121
91	106	134	93	144	108	142	82	90	178	179	115	104	118
55	87	105	113	111	107	76	82	109	131	105	96	99	83
73	90	69	98	151	134	78	70	77	116	106	96	68	76
69	88	78	110	102	90	78	58	80	172	98	106	95	75
87	**116**	**40**	**96**	**109**	**65**	**98**	**64**	**110**	**158**	**56**	**120**	**106**	**48**
75	**76**	**71**	**82**	**136**	**78**	**87**	**78**	**91**	**131**	**89**	**104**	**89**	**65**
81	72	79	73	87	83	89	91	86	111	86	73	89	78
72	78	66	93	198	75	87	55	97	150	91	142	88	59
76	**91**	**89**	**103**	**138**	**92**	**85**	**75**	**102**	**159**	**101**	**112**	**101**	**82**
100	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
69	**95**	**86**	**120**	**147**	**93**	**79**	**67**	**100**	**187**	**102**	**121**	**92**	**84**
84	**109**	**39**	**106**	**107**	**67**	**92**	**59**	**110**	**178**	**61**	**125**	**103**	**47**
69	**95**	**79**	**120**	**141**	**91**	**78**	**66**	**100**	**189**	**98**	**122**	**92**	**80**
71	**97**	**96**	**112**	**125**	**95**	**84**	**75**	**104**	**165**	**104**	**109**	**102**	**92**
71	104	94	121	137	95	83	82	110	201	110	126	109	95
70	72	103	97	113	100	77	57	96	148	80	91	90	82
74	111	110	98	116	108	123	65	88	119	114	84	94	98
68	**92**	**57**	**128**	**168**	**85**	**73**	**53**	**95**	**210**	**97**	**137**	**81**	**67**

Table 31. Percent Distribution of Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups and by Economy, 2009

EXPENDITURE CATEGORY/ECONOMY	BAN	BHU	BRU	CAM	PRC	FIJ	HKG
GROSS DOMESTIC PRODUCT	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Actual Final Consumption[a]	**78.5**	**53.1**	**29.9**	**84.1**	**39.7**	**83.0**	**65.9**
Food and Nonalcoholic Beverages	39.6	19.9	5.20	38.7	8.9	21.78	7.1
Bread and Cereals	17.5	8.22	1.02	11.8	1.38	2.90	0.59
Meat and Fish	7.56	2.05	1.69	11.4	3.18	6.18	3.62
Fruits and Vegetables	5.36	2.71	0.85	5.55	2.08	3.49	0.84
Other Food and Nonalcoholic Beverages	9.13	6.91	1.63	9.88	2.28	9.21	2.00
Clothing and Footwear: of which	4.56	3.87	1.27	1.57	2.74	1.95	2.40
Clothing	4.05	3.13	1.10	0.81	2.10	1.06	1.72
Housing, Water, Electricity, Gas, and Other Fuels	13.5	8.97	3.45	10.8	5.53	21.4	11.5
Health and Education	7.53	8.73	7.02	11.7	7.05	10.7	10.4
Health	2.95	4.31	1.76	6.57	3.29	4.57	5.19
Education	4.57	4.42	5.25	5.16	3.76	6.11	5.18
Transportation and Communication: of which	3.70	1.33	6.07	6.42	3.76	6.64	5.91
Transportation	3.33	1.09	4.41	6.21	1.85	6.32	4.52
Recreation and Culture	0.54	1.47	2.29	2.08	1.75	4.11	6.66
Restaurants and Hotels	1.80	0.04	1.50	4.09	1.93	2.36	7.26
Other Consumption Expenditure Items	7.29	8.82	3.12	8.73	8.04	14.1	14.8
Collective Consumption Expenditure By General Government	**3.74**	**12.81**	**14.92**	**3.78**	**8.46**	**7.95**	**5.28**
Gross Fixed Capital Formation: of which	**25.1**	**41.3**	**18.1**	**11.8**	**45.2**	**25.5**	**19.9**
Machinery and Equipment	5.29	13.3	7.25	5.79	12.5	12.3	9.62
Construction	19.8	28.0	10.1	5.87	30.1	9.57	9.13
Change in Inventories and Net Acquisitions of Valuables	–	–	**0.01**	**0.54**	**2.25**	**1.10**	**1.41**
Balance of Exports and Imports	**–7.33**	**–7.22**	**37.0**	**–0.22**	**4.34**	**–17.5**	**7.48**
Household Final Consumption Expenditure	**76.83**	**44.58**	**23.93**	**79.34**	**34.98**	**75.77**	**62.41**
Government Final Consumption Expenditure	**5.42**	**21.35**	**20.91**	**8.55**	**13.19**	**15.16**	**8.81**
Actual Final Consumption[a]	**78.5**	**53.1**	**29.9**	**84.1**	**39.7**	**83.0**	**65.9**
All Goods	**57.8**	**35.9**	**12.4**	**56.7**	**20.6**	**40.5**	**20.3**
Nondurables	48.8	25.3	6.21	47.5	13.8	31.3	9.82
Semi-Durables	6.21	8.51	3.50	4.79	3.90	5.90	5.39
Durables	2.90	2.20	2.91	4.76	3.05	3.51	5.47
Services	**20.5**	**16.1**	**15.9**	**25.8**	**16.1**	**41.5**	**44.6**

a Includes individual consumption expenditure by households, by non-profit institutions serving households, and by government.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China. The shares of the aggregates to GDP are not additive due to the use of the Eltetö-Köves-Szulc (EKS) aggregation method, which is not additive.

Table 31. Percent Distribution of Gross Domestic Product by Major Expenditure Aggregates, Categories, and Groups and by Economy, 2009 *continued*

IND	INO	LAO	MAL	MLD	MON	NEP	PAK	PHI	SIN	SRI	TAP	THA	VIE
100.0	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
61.2	**62.6**	**58.3**	**57.0**	**53.8**	**66.6**	**83.2**	**86.5**	**78.2**	**44.1**	**72.3**	**65.4**	**60.4**	**66.1**
17.6	27.6	25.0	9.4	12.3	23.4	45.7	36.4	36.6	3.31	25.6	7.71	11.5	17.9
4.31	7.15	11.1	1.82	2.21	4.81	24.0	8.44	9.84	0.51	7.45	1.50	1.87	5.17
1.58	3.78	8.71	2.83	2.10	8.18	4.33	6.41	10.1	1.08	4.25	2.30	2.11	7.13
4.86	4.25	3.46	2.44	3.46	2.10	5.36	7.22	3.36	0.52	7.80	1.97	3.50	2.51
6.89	12.4	1.70	2.33	4.57	8.33	11.9	14.3	13.3	1.20	6.13	1.93	4.03	3.04
3.83	1.74	1.02	1.09	1.91	5.50	4.27	6.62	1.46	1.16	3.88	2.74	3.36	2.86
3.19	1.45	0.80	0.95	1.60	3.88	3.46	4.86	1.01	0.96	3.86	2.39	3.06	2.38
7.67	6.20	8.11	9.35	16.0	11.5	9.65	15.4	9.72	7.78	7.96	10.81	4.51	10.48
6.30	7.94	5.82	8.29	12.6	6.55	10.4	11.60	6.29	7.62	6.06	11.8	9.50	11.2
3.23	1.64	1.76	2.92	5.08	2.09	6.66	7.33	1.99	4.05	3.22	6.01	5.16	5.66
3.07	6.30	4.06	5.37	7.55	4.46	3.73	4.27	4.31	3.58	2.83	5.79	4.34	5.55
10.92	9.84	8.50	10.18	3.51	7.23	2.91	6.76	7.84	7.00	15.9	8.72	8.78	7.99
9.48	6.98	7.64	6.97	1.83	5.22	2.71	5.15	6.09	5.91	14.2	6.38	8.11	7.47
0.84	1.63	1.77	2.53	1.89	1.37	0.75	3.26	0.93	4.63	2.01	5.55	2.47	3.16
1.78	1.21	1.80	5.15	0.59	0.73	1.65	0.51	1.71	3.61	1.01	3.86	10.9	4.57
12.2	6.46	6.27	11.0	4.94	10.3	7.97	5.94	13.7	9.04	9.81	14.2	9.36	7.98
8.54	**5.74**	**11.63**	**6.94**	**13.28**	**6.15**	**7.04**	**2.81**	**6.34**	**7.85**	**9.67**	**8.28**	**7.87**	**6.27**
33.1	**31.1**	**31.7**	**20.1**	**53.5**	**29.0**	**21.3**	**16.6**	**19.0**	**28.5**	**23.8**	**18.9**	**24.4**	**34.3**
14.23	3.78	10.9	12.6	18.4	13.8	2.81	14.7	8.54	11.3	6.17	8.51	16.3	9.89
18.9	26.6	14.0	6.87	21.0	13.9	13.8	1.95	8.88	16.4	16.6	8.49	7.97	22.2
2.62	**–2.25**	**2.13**	**–5.64**	**–**	**5.50**	**10.6**	**1.60**	**–2.42**	**–1.53**	**0.75**	**–1.22**	**–3.20**	**3.59**
–5.46	**2.80**	**–3.74**	**21.5**	**–20.6**	**–7.28**	**–22.17**	**–7.55**	**–1.13**	**21.0**	**–6.51**	**8.63**	**10.5**	**–10.3**
57.96	**58.73**	**54.83**	**49.86**	**44.83**	**58.63**	**79.54**	**81.80**	**74.67**	**40.60**	**64.33**	**60.75**	**54.97**	**61.65**
11.76	**9.59**	**15.10**	**14.11**	**22.24**	**14.16**	**10.74**	**7.53**	**9.86**	**11.40**	**17.65**	**12.96**	**13.29**	**10.73**
61.2	**62.6**	**58.3**	**57.0**	**53.8**	**66.6**	**83.2**	**86.5**	**78.2**	**44.1**	**72.3**	**65.4**	**60.4**	**66.1**
35.6	**42.3**	**44.0**	**23.8**	**24.4**	**39.6**	**63.7**	**62.7**	**54.6**	**14.5**	**45.7**	**28.1**	**32.4**	**39.1**
24.0	33.1	33.2	13.2	17.6	28.3	55.4	49.7	48.6	5.89	32.1	12.2	19.4	26.9
9.80	5.62	4.75	5.95	4.21	9.27	5.72	9.83	4.23	3.23	7.22	8.62	9.18	5.59
1.83	3.73	6.23	5.08	3.11	2.48	2.83	3.42	2.16	5.69	6.52	7.54	4.30	7.17
24.7	**19.3**	**13.7**	**31.0**	**27.7**	**21.7**	**18.6**	**20.6**	**23.0**	**27.5**	**18.5**	**35.2**	**27.0**	**24.8**

Table 32. Shares of Each Economy to Asia's Real Expenditures, by Major Expenditure Aggregates, Categories, and Groups,[a] 2009 (Asia = 100)

EXPENDITURE CATEGORY/ECONOMY	BAN	BHU	BRU	CAM	PRC	FIJ	HKG	IND
GROSS DOMESTIC PRODUCT	**1.37**	**0.02**	**0.10**	**0.16**	**47.52**	**0.02**	**1.42**	**19.89**
Actual Final Consumption[b]	**2.13**	**0.02**	**0.05**	**0.26**	**36.10**	**0.03**	**1.64**	**25.12**
Food and Nonalcoholic Beverages	3.66	0.03	0.04	0.36	32.73	0.04	0.71	27.18
Bread and Cereals	6.35	0.05	0.04	0.52	24.93	0.03	0.24	30.22
Meat and Fish	3.04	0.01	0.05	0.40	52.48	0.05	1.70	10.04
Fruits and Vegetables	3.11	0.02	0.02	0.24	30.57	0.02	0.32	35.11
Other Food and Nonalcoholic Beverages	2.46	0.03	0.04	0.28	24.57	0.05	0.67	32.09
Clothing and Footwear: of which	2.40	0.03	0.04	0.10	25.25	0.02	1.73	36.54
Clothing	2.60	0.03	0.05	0.06	26.01	0.02	1.56	37.02
Housing, Water, Electricity, Gas, and Other Fuels	2.49	0.03	0.03	0.19	37.95	0.03	1.39	21.76
Health and Education	1.71	0.03	0.06	0.51	40.69	0.02	1.22	21.23
Health	1.17	0.02	0.03	0.37	41.78	0.02	1.22	25.26
Education	2.23	0.03	0.10	0.66	40.08	0.02	1.17	16.17
Transportation and Communication: of which	0.67	0.00	0.10	0.10	31.59	0.02	1.11	27.79
Transportation	0.81	0.00	0.12	0.15	23.08	0.02	1.48	34.19
Recreation and Culture	0.34	0.01	0.10	0.17	44.53	0.04	6.65	10.74
Restaurants and Hotels	1.14	0.00	0.06	0.27	35.21	0.02	5.19	14.44
Other Consumption Expenditure Items	1.29	0.02	0.04	0.18	40.24	0.04	2.54	27.38
Collective Consumption Expenditure By General Government	**0.52**	**0.04**	**0.20**	**0.13**	**54.49**	**0.02**	**0.76**	**17.40**
Gross Fixed Capital Formation: of which	**0.91**	**0.02**	**0.05**	**0.05**	**60.46**	**0.01**	**0.95**	**16.60**
Machinery and Equipment	0.50	0.02	0.07	0.07	50.75	0.03	2.22	20.82
Construction	1.21	0.03	0.04	0.05	63.72	0.01	0.45	15.63
Change in Inventories and Net Acquisitions of Valuables	–	–	–	**0.04**	**54.08**	**0.01**	**1.19**	**26.43**
Balance of Exports and Imports	**–2.06**	**–0.03**	**1.18**	**–0.01**	**65.19**	**–0.15**	**4.64**	**–20.54**
Household Final Consumption Expenditure	**2.27**	**0.02**	**0.05**	**0.25**	**34.36**	**0.03**	**1.73**	**26.22**
Government Final Consumption Expenditure	**0.51**	**0.04**	**0.16**	**0.20**	**55.21**	**0.02**	**0.76**	**15.95**
Actual Final Consumption[b]	**2.13**	**0.02**	**0.05**	**0.26**	**36.10**	**0.03**	**1.64**	**25.12**
All Goods	2.61	0.03	0.05	0.26	34.09	0.03	1.16	26.14
Nondurables	3.22	0.03	0.03	0.30	35.40	0.04	0.66	26.06
Semi-Durables	1.50	0.03	0.07	0.12	21.69	0.03	1.78	35.83
Durables	0.83	0.01	0.11	0.21	45.34	0.02	4.07	10.22
Services	**1.57**	**0.02**	**0.06**	**0.25**	**36.77**	**0.03**	**2.28**	**25.06**

a Real refers to purchasing power parity-adjusted values.
b Includes individual consumption expenditure by households, by non-profit institutions serving households, and by government.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity (PPP) Update for computation purposes. For consistency and comparability with the 2005 PPP benchmarks, Asia refers to the 21 participating economies in the 2009 PPP Update in Asia and the Pacific, and the Islamic Republic of Iran and Macao, China. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China.

Table 32. Shares of Each Economy to Asia's Real Expenditures, by Major Expenditure Aggregates, Categories, and Groups,[a] 2009 (Asia = 100) *continued*

INO	LAO	MAL	MLD	MON	NEP	PAK	PHI	SIN	SRI	TAP	THA	VIE	ASIA
6.71	**0.09**	**2.04**	**0.01**	**0.06**	**0.20**	**2.90**	**1.96**	**1.31**	**0.53**	**3.67**	**3.20**	**1.53**	**100**
7.94	**0.09**	**2.05**	**0.01**	**0.07**	**0.33**	**4.92**	**2.93**	**0.95**	**0.69**	**4.51**	**3.84**	**1.81**	**100**
12.91	0.11	1.32	0.01	0.09	0.69	5.77	4.96	0.32	0.83	1.89	2.64	1.53	100
15.23	0.18	1.02	0.01	0.06	1.67	4.90	6.77	0.19	1.07	1.42	1.71	2.10	100
8.09	0.20	1.90	0.01	0.20	0.25	4.45	6.58	0.43	0.56	2.52	2.37	2.30	100
10.60	0.08	1.20	0.01	0.02	0.34	6.47	1.32	0.20	1.13	2.04	3.47	1.01	100
15.81	0.02	1.21	0.01	0.10	0.54	7.34	5.57	0.41	0.63	1.65	2.83	0.85	100
4.68	0.03	0.66	0.01	0.12	0.40	9.20	0.98	0.57	1.16	4.68	5.02	1.49	100
4.63	0.03	0.62	0.01	0.10	0.38	8.03	0.81	0.59	1.38	4.83	5.37	1.50	100
6.06	0.12	1.79	0.01	0.07	0.25	8.45	2.57	0.70	0.71	3.78	2.55	1.85	100
6.65	0.15	1.77	0.03	0.08	0.35	5.82	1.40	0.84	0.59	5.34	3.92	3.69	100
2.11	0.06	1.18	0.02	0.04	0.42	7.12	0.74	0.85	0.44	6.26	3.72	2.79	100
12.25	0.28	2.41	0.05	0.13	0.25	4.10	2.18	0.81	0.72	4.40	3.92	4.63	100
7.98	0.06	3.41	0.01	0.06	0.05	2.73	2.07	1.32	0.69	4.95	3.67	1.17	100
9.22	0.08	3.77	0.00	0.06	0.07	2.76	2.95	1.59	0.86	5.42	5.33	1.61	100
5.62	0.05	2.41	0.01	0.03	0.08	3.73	0.80	3.61	0.45	12.19	3.65	2.06	100
3.37	0.07	4.72	0.00	0.01	0.14	0.57	1.73	2.65	0.19	7.03	19.57	2.72	100
4.84	0.05	2.36	0.01	0.06	0.17	2.10	3.52	1.18	0.51	6.19	3.18	1.27	100
3.73	**0.22**	**1.95**	**0.02**	**0.06**	**0.14**	**1.03**	**1.36**	**1.27**	**1.00**	**3.64**	**2.72**	**1.79**	**100**
6.59	**0.07**	**1.41**	**0.02**	**0.05**	**0.10**	**1.06**	**1.04**	**1.19**	**0.33**	**2.04**	**2.16**	**1.54**	**100**
2.64	0.07	3.10	0.03	0.07	0.04	2.53	1.56	1.75	0.28	4.12	4.53	1.16	100
8.59	0.06	0.67	0.01	0.04	0.10	0.28	0.72	0.94	0.36	1.06	1.11	1.73	100
–8.06	**0.08**	**–6.39**	**–**	**0.17**	**1.05**	**2.17**	**–2.42**	**–1.07**	**0.19**	**–2.48**	**–5.05**	**2.58**	**100**
4.48	**–0.06**	**12.32**	**–0.09**	**–0.10**	**–0.91**	**–3.77**	**–0.56**	**11.43**	**–0.81**	**9.65**	**8.25**	**–2.98**	**100**
8.17	**0.09**	**1.97**	**0.01**	**0.07**	**0.34**	**5.02**	**3.07**	**0.97**	**0.64**	**4.63**	**3.84**	**1.75**	**100**
4.27	**0.19**	**2.31**	**0.03**	**0.09**	**0.15**	**1.93**	**1.35**	**1.05**	**1.09**	**3.51**	**3.04**	**2.00**	**100**
7.94	**0.09**	**2.05**	**0.01**	**0.07**	**0.33**	**4.92**	**2.93**	**0.95**	**0.69**	**4.51**	**3.84**	**1.81**	**100**
9.65	0.10	1.68	0.01	0.08	0.43	5.81	3.63	0.66	0.76	3.99	3.43	1.70	100
10.37	0.12	1.28	0.01	0.08	0.56	6.16	4.49	0.33	0.74	2.22	2.85	1.68	100
8.52	0.05	2.39	0.01	0.09	0.21	5.92	1.51	0.82	0.77	7.23	5.43	1.36	100
5.86	0.10	3.25	0.01	0.03	0.10	2.90	1.34	2.86	0.78	10.94	3.91	2.31	100
6.13	**0.07**	**2.52**	**0.01**	**0.06**	**0.19**	**3.54**	**2.20**	**1.30**	**0.43**	**5.24**	**4.76**	**1.97**	**100**

Appendix 1
The Country-Product-Dummy Method

The country-product-dummy (CPD) method is a multilateral approach in which the purchasing power parities (PPPs) are estimated simultaneously for all products and for all countries within a region, with simultaneous estimation of prices for all products. An important property of the PPPs generated by this model is that they are transitive.

In the 2005 International Comparison Program (ICP), the starting point of the CPD approach was a matrix of prices (in national currencies) for products priced within each country in the region concerned. There were gaps in the matrix because it was not possible (and neither necessary nor generally desirable) for all countries to price every product in the list. The CPD method is a regression technique. The underlying model is multiplicative (but additive in logarithms). It assumes that prices vary by product within countries at the same rate across all countries, and that prices vary between countries at the same rate across all products. In practice, one country has to be chosen as a base, and all other product-country combinations are measured in terms of their variation from this base. An error term (also multiplicative in this case) is required to handle differences in the observed country-product prices from those generated by the model.

The CPD index[1] can be presented in two equivalent forms—with or without an intercept. The variant with an intercept is described in the 2011 ICP Handbook.[2]

The starting point is a multiplicative CPD model, which can be illustrated by a general example. Let us assume that there are m countries and that their product list contains n products. Then, for each product in each country, the observed price is p_{ij} for $j = 1, 2, \ldots, m$ and for $i = 1, 2, \ldots, n$. Note that the prices p_{ij} are expressed in each country's national currencies. The multiplicative CPD model is expressed as

$$p_{ij} = \kappa \alpha_j \beta_i \nu_{ij} \quad (1)$$

where p_{ij} is the price of product i in country j and ν_{ij} is the error term.

The CPD model is converted from a multiplicative one to an additive one by expressing the terms in the model as logarithms:

$$ln\, p_{ij} = ln\, \kappa + ln\alpha_j + ln\, \beta i + \varepsilon_{ij} \quad (2)$$

The observed price data are expressed in national currencies. Dummy variables with values of 1 or 0 are used to represent each country (j) and product (i). The regression coefficients are estimated by ordinary least squares. It is necessary to specify a base country and base product for the model, so if the base country is country *1* and the base product is product *1*, then $\alpha_1 = \beta_1 = 1$ and it follows that $ln\, \alpha_1 = ln\, \beta_1 = 0$. Any other country can be made the base country simply by dividing every country's PPP by the new base country's PPP.

Differences between observed prices and the modelled prices provide an indication of possible problems with the prices provided by a country. Large differences indicate that prices for the same product vary significantly between countries or that the product is either mis-specified or is not representative of the economy. The distribution of these differences provides the underlying basis for the Dikhanov table as an editing tool. The distributions can be graphed to provide a simple means of identifying potential problem prices, for a product across countries or for a set of products within a country.

1 Introduced by Summers, R. and A. Heston. 1991. The Penn World Table (Mark 5): An Expanded Set of International Comparisons, 1958–1988. *Quarterly Journal of Economics* 106(2):327–368. For a thorough discussion see Rao, D.S. Prasada, (2004), "*The Country-Product-Dummy Method: A Stochastic Approach to the Computation of Purchasing Power Parities in the ICP*," Center for Efficiency and Productivity Analysis Working Papers Series WP032004, School of Economics, University of Queensland, Australia, and Diewert, W.E. (2004),"*On the Stochastic Approach to Linking the Regions in the ICP*", Discussion Paper No.04-16, Department of Economics, University of British Columbia, Vancouver.

2 The variant with an intercept is presented in Chapter 11 of the 2011 ICP Handbook, but Rao and Diewert (footnote 1) use one without an intercept.

Appendix 2
The Eltetö, Köves, and Szulc Method

The EKS method (named after its developers Eltetö, Köves, and Szulc) is a means of aggregating basic heading purchasing power parities (PPPs) to broader levels, such as household final consumption expenditure, up to and including gross domestic product (GDP) itself.

Using the EKS method is a two-stage process. The first stage involves calculating PPPs for each basic heading for every pair of countries in the comparison. The outcome can be thought of as being a matrix for each basic heading showing the bilateral PPP between each pair of countries. One of the drawbacks at this stage is that these PPPs are not transitive (i.e., the PPPs calculated directly between the two countries will differ from those obtained if the PPPs for the two countries were calculated indirectly through a third country). The second stage produces transitive PPPs from the non-transitive ones calculated in the first stage. The EKS formula shown earlier relates to this second stage, although the whole process of calculating the bilateral PPPs and then making the results transitive using the EKS formula is commonly referred to as "using the EKS method" to calculate PPPs.

One of the characteristics of the EKS method is that the real expenditures obtained using the EKS-based PPPs are not additive, which means the real expenditures for the final expenditure components of GDP will not add to that for GDP (similar to the non-additivity issue associated with calculating chain volumes in time series national accounts). As a result, the EKS-based PPPs have to be calculated separately for each expenditure aggregate because it is not possible to obtain volumes for any aggregates directly by summing the volumes for more detailed aggregates. On the other hand, the EKS method has the major advantage of producing unbiased estimates, which outweighs the drawback of non-additivity in the real expenditures. Some of the methods that produce additive real expenditures (e.g., the Geary-Khamis [GK] method) have shortcomings such as biased results, particularly when countries at different stages of economic development are being compared. The Iklé-Dikhanov-Balk (IDB) results are closer to the EKS results and are additive.

As noted, in the first stage of the EKS method, PPPs are derived for each broad aggregate (e.g., household final consumption expenditure) above the basic heading level for each pair of economies in the region. In this stage, the basic heading expenditures are used as weights, unlike the process for calculating PPPs at the basic heading level, where the prices are unweighted (perhaps more correctly expressed as "having equal weights"). For each pair of economies in turn, the first step is to combine the basic heading parities between them using the basic heading values of one economy (in national currency) as weights. Next, the process is repeated using the other economy's basic heading values (expressed in terms of that economy's national currency) as the weights. The PPP for that expenditure aggregate between the two economies is calculated as the geometric mean of the two PPPs calculated using each economy's weights separately (i.e., similar to the process used to calculate Fisher price indexes in time series).

The outcome of this process is a matrix of PPPs for each pair of economies, for each aggregate for which PPPs are required, up to the level of GDP. Each matrix consists of non-transitive PPPs for each aggregate, which are then made transitive by applying the EKS formula described below.

The mechanics of the EKS formula are quite straightforward. If there are n economies in the region, transitive PPPs are obtained as the nth root of the n direct and indirect PPPs that can be calculated, with the direct PPPs having twice the weight of the indirect PPPs. The EKS parities which make use of Fisher-binary index numbers as building blocks are given by, for any pair of economies j and k:

$$PPP_{jk} = \left[\prod_{l=1}^{M} \left[F_{jl} \times F_{lk} \right] \right]^{1/M}$$

where F_{jk} refers to the standard Fisher index for country k with country j as the base.

The EKS formula can be illustrated by a simple example with three economies—A, B, and C. The transitive PPP for economies A and B for a given aggregate is:

$$PPP_{A,B} = [(F_{A,B} \times F_{B,B}) \times (F_{A,A} \times F_{A,B}) \times (F_{A,C} \times F_{C,B})]^{1/3}$$

It is useful to note here that both $F_{A,A}$ and $F_{B,B}$ are equal to 1.

The EKS formula produces transitive PPPs that are as close as possible to the nontransitive PPPs originally calculated in the binary comparisons. For the EKS formula to work, it is necessary for PPPs to be available for all economies for each basic heading. Occasionally, some PPPs for some economies were missing because of data collection problems or data consistency issues. In such cases, PPPs had to be imputed either by using the PPP of a similar basic heading or from a broader (but related) aggregate.

The aggregation process was identical for each level of aggregation in the national accounts. For example, all 155 basic headings had to be combined to obtain a PPP for GDP, while the 29 basic headings that make up the food and nonalcoholic beverages category within actual household final consumption expenditure were combined using a similar process, to calculate a PPP for that category.

The transitive PPPs were used as deflators to convert aggregates expressed in local currency into volumes expressed in a common currency. It is important to note that the volumes are not additive, with the EKS-based PPPs having to be calculated separately for each category, i.e., it is not possible to obtain volumes for any aggregates directly through aggregating elementary volumes.

Appendix 3
Reference Purchasing Power Parities, 2009

Code	Description	Reference PPPs
1102311	Narcotics	PPP for tobacco
1104111	Actual and imputed rentals for housing	Volume relatives of household final consumption expenditure including NPISH.
1104421	Miscellaneous services relating to the dwelling	Weighted average of PPPs for maintenance of the dwellings and water supply
1105131	Repair of furniture, furnishings, and floor coverings	PPPs for maintenance of the dwelling
1105331	Repair of household appliances	PPPs for maintenance of the dwelling
1105511	Major tools and equipment	Weighted average of the PPPs for glassware, tableware and utensils; small tools and miscellaneous accessories; and nondurable household goods
1105622	Household services	PPPs for maintenance of the dwelling
1106311	Hospital services	Weighted average of PPPs for medical services, dental services, and paramedical services
1107121	Motor cycles	PPP for purchase of vehicles (excluding reference PPP basic headings)
1107141	Animal drawn vehicles	PPPs for purchase of vehicles (excluding reference PPP basic headings)
1107341	Passenger transport by sea and inland waterway	Weighted average of PPPs for operation of personal transport equipment and transport service (excluding reference PPP basic headings)
1107351	Combined passenger transport	Weighted average of PPPs for operation of personal transport equipment and transport service (excluding reference PPP basic headings)
1107361	Other purchased transport services	Weighted average of PPPs for operation of personal transport equipment and transport service (excluding reference PPP basic headings)
1109211	Major durables for outdoor and indoor recreation	Weighted average of PPPs for bicycles and audio-visual, photographic, and information processing equipment
1109231	Maintenance and repair of other major durables for recreation and culture	PPPs for maintenance and repair of the dwelling
1109331	Gardens and pets	PPPs for household final consumption expenditure on the domestic market (excluding reference PPP basic headings)
1109351	Veterinary and other services for pets	Weighted PPPs for household final consumption expenditure on the domestic market (excluding reference PPP basic headings)
1109431	Games of chance	PPPs for household final consumption expenditure on the domestic market (excluding reference PPP basic headings)
1112411	Social protection	PPPs for household final consumption expenditure on the domestic market (excluding health and education basic headings and reference PPP basic headings)
1112511	Insurance	PPPs for household final consumption expenditure on the domestic market (excluding health and education basic headings and reference PPP basic headings)
1112611	FISIM	PPPs for household final consumption expenditure on the domestic market (excluding health and education basic headings and reference PPP basic headings)

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Appendix 3. continuation

Code	Description	Reference PPPs
1112621	Other financial services, n.e.c.	PPPs for household final consumption expenditure on the domestic market (excluding health and education basic headings and reference PPP basic headings)
1112711	Other services, n.e.c.	PPPs for household final consumption expenditure on the domestic market (excluding health and education basic headings and reference PPP basic headings)
1301111	Housing	PPP for actual and imputed rentals for housing from household
1302111	Pharmaceutical products	PPP for pharmaceutical products from household
1302112	Other medical products	PPP for other medical productsfrom household
1302113	Therapeutic appliances and equipment	PPP for therapeutic appliances and equipment from household
1302121	Outpatient medical services	PPP for outpatient medical services from household
1302122	Outpatient dental services	PPP for outpatient dental services from household
1302123	Outpatient paramedical services	PPP for outpatient paramedical services from household
1302124	Hospital services	PPP for hospital services from household
1302211	Compensation of employees (physicians, nurses, and other medical and nonmedical staff)	Compensation for occupations 110–113 per Box 3, 2003–2006 ICP Handbook Chapter 3. PPPs were adjusted to account for productivity.
1302221	Intermediate consumption	Weighted PPPs for household final consumption expenditure on the domestic market (excluding reference PPP basic headings)
1302231	Gross operating surplus	Weighted PPPs for gross fixed capital formation.
1302241	Net taxes on production	Weighted PPPs for household final consumption expenditure on the domestic market (excluding reference PPP basic headings) and PPP for compensation of employees for the production of health services by government
1303111	Recreation and culture	PPPs for recreation and culture from household
1304111	Education benefits and reimbursements	PPP for education from household
1304211	Compensation of employees (primary, secondary, and postsecondary education)	Occupations 106, 201–212, 216, and 301–305 per Chapter 3, 2003–2006 ICP Handbook. PPPs were adjusted to account for productivity.
1304221	Intermediate consumption	Weighted PPPs for household final consumption expenditure on the domestic market (excluding reference PPP basic headings)
1304231	Gross operating surplus	Weighted PPPs for gross fixed capital formation.
1304241	Net taxes on production	Weighted PPPs for household final consumption expenditure on the domestic market (excluding reference PPP basic headings) and PPP for compensation of employees for the production of education services by government
1305111	Social protection	PPPs for household final consumption expenditure on the domestic market (excluding health and education basic headings and reference PPP basic headings)
1401111	Compensation of employees (defense and nondefense collective services)	Occupations 201–226 and 401–406 per Chapter 3, 2003–2006 ICP Handbook. PPPs were adjusted to account for productivity.
1401121	Intermediate consumption	Weighted PPPs for household final consumption expenditure on the domestic market and PPPs for gross fixed capital formation (excluding reference PPP basic headings)
1401131	Gross operating surplus	Weighted PPPs for gross fixed capital formation.

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Appendix 3. continuation

Code	Description	Reference PPPs
1401141	Net taxes on production	Weighted PPPs for household final consumption expenditure on the domestic market (excluding reference PPP basic headings) and PPP for compensation of employees for the collective services by the government
1501100	Metal products and equipment	Geometric mean of the PPPs of general purpose machinery; special purpose machinery; and electrical and optical equipment
1501111	Fabricated metal products, except machinery and equipment	PPPs for Metal products
1501151	Other manufactured goods, n.e.c.	PPPs for metal products and equipment (excluding reference PPP basic headings)
1501200	Transport equipment	PPP for motor vehicles, trailers and semi-trailers
1501212	Other road transport	PPPs for transport equipment (excluding reference PPP basic headings)
1501221	Other transport equipment	PPPs for transport equipment (excluding reference PPP basic headings)
1503111	Other products	PPPs for metal products and equipment (excluding reference PPP basic headings)
1600000	Changes in inventories and net acquisitions of valuables	PPPs for durable and nondurable goods; and gross fixed capital formation (excluding reference PPP basic headings)
1701111	Exports of goods and services	Exchange rates
1701112	Imports of goods and services	Exchange rates

PPP = purchasing power parity, n. e. c. = not elsewhere classified.

Appendix 4
Price Level Indexes and Real Expenditures Relative to Asia

The price level indexes (PLIs) presented in the main body of this publication are either based on the Hong Kong dollar (HK$) as the reference currency or as an index based on the Asia[3] (regional) average being equal to 100. The procedures used in deriving PLIs relative to the Asia average and volume indexes expressed in terms of the Asia are described in this appendix.

Price level index with a reference currency. When the HK$ is used as the reference currency, the PLI for any given economy is defined as the ratio of the purchasing power parity (PPP) and the exchange rate (XR) of the currency of the economy considered. Thus for economy *j,* the PLI is defined as:

$$PLI_j = \frac{PPP_j}{XR_j} \tag{1}$$

By definition, the PLI for Hong Kong, China is equal to 1, although it is common for PLIs to be expressed on a base of 100, similar to time series price indexes such as a consumer price index. A major disadvantage with this measure is that all PLIs are expressed relative to Hong Kong, China, so information on price levels in Hong Kong, China cannot be obtained.

Price level index based on Asia (regional) average. To derive PLIs based on the Asia average, it is necessary to define the average PLI for the region. As economies differ in size, the average used is a weighted average where the weights are the relative sizes of different economies measured using the real gross domestic product (RGDP). RGDP is defined as gross domestic product (GDP) expressed in local currency units converted into a reference currency using PPPs. If GDP and real GDP represent the GDP in local currency units and in reference currency units based on a PPP conversion respectively, then for economy *j*, we have

$$P = \frac{P}{PPP} \tag{2}$$

Using RGDP as weights, the Asia average is defined as:

$$\text{Asia Average PLI} = \sum_{j=1}^{23} PLI_j \; x \; \frac{RGDP_j}{\sum_{j=1}^{23} RGDP_j} \tag{3}$$

Now using the expressions for PLI and RGDP from equations (1) and (2), we can expand the expression for the Asia average PLI as:

$$\text{Asia Average PLI} = \sum_{j=1}^{23} PLI_j \; x \; \frac{RGDP_j}{\sum_{j=1}^{23} RGDP_j} = \sum_{j=1}^{23} \left[\frac{PPP_j}{XR_j}\right] x \; \frac{(GDP_j/PPP_j)}{\sum_{j=1}^{23} RGDP_j} \tag{4}$$

This expression can now be equivalently expressed as:

$$\text{Asia Average PLI} = \frac{\sum_{j=1}^{23} (GDP_j/XR_j)}{\sum_{j=1}^{23} (GDP_j/PPP_j)} = \mu \text{ (conversion factor)} \tag{5}$$

3 The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity Update for computation purposes. For consistency and comparability with the 2005 PPP benchmarks, Asia refers to the 21 participating economies in the 2009 PPP Update in Asia and the Pacific, and the Islamic Republic of Iran and Macao, China.

The Asia average PLI is simply the ratio of the sum of nominal GDP (GDP converted using exchange rates) and the real GDP (GDP converted using PPPs), expressed on the base of the economy whose currency is being used as the reference currency (HK$). The Asia average, μ, will generally not be equal to 1.

Now we can define the PLI for each economy on the base of the Asia average PLI equal to 1 by dividing the PLI in equation (1) for each economy by the conversion factor, μ.

PLI (with Asia average = 1) =

(*PLI* with HK$ as reference currency)/μ. (6)

Note that the PLIs defined relative to the Asia average equal to unity do not depend on which currency is used as the reference currency in the first place. The PLIs would be identical even if another currency were used in the place of HK$ as the reference currency; although the conversion factor (μ) used to convert from the reference currency to the Asia average would be different.

Real expenditure indexes expressed on a base of Asia (regional) average equal to 100. In the main body of this publication, several tables report results relative to the Asia average as the base. In particular, per capita real GDP as well as the PLIs are also presented as indexes with the Asia average equal to 100 by multiplying all the ratios by 100.

The GDP of each economy is expressed in that economy's local currency referred to here as local currency units (LCUs). To make valid comparisons among various economies, these GDP figures must first be converted to a numeraire currency, in this case HK$. These conversions may be accomplished using official exchange rates. GDPs converted to HK$ using official exchange rates are expressed in nominal terms because they will incorporate differences in price levels among economies. When GDPs are converted to a numeraire currency using PPPs, they are expressed in real terms. They become comparable from one economy to another, because the purchasing power of each local currency has been taken into account. Being comparable, these GDP figures can be summed directly to calculate a regional GDP. Note that it does not matter what currency is used as the numeraire currency. It can be the HK$, Indian rupee, or any other currency, including one from outside the region, such as the US dollar. The shares of each economy's GDP within the regional GDP will not change nor will the position of each economy compared with other economies in the region. Note also that the purchasing power of HK$1 is not the same as the purchasing power of one unit based on the Asia average.

Computing the conversion factor (μ) for GDP. The step by step calculation of the conversion factor (μ) is explained by referring to Appendix Table 4. It shows national GDPs in local currency in column (1), PPPs with Hong Kong, China equal to one in column (3), and official exchange rates between each country and Hong Kong, China in column (2). GDP in local currency for each country is converted in real terms with Hong Kong, China as base using the PPPs [column (1)/ column (3) = column (5)]. These are summed to obtain the regional GDP in real terms with Hong Kong, China as base. Meanwhile, the GDPs in local currencies are converted to GDP in nominal terms, expressed in terms of HK$, using the exchange rate [column (1)/column (2) = column (4)]. The converted GDPs for each economy from column 4 are summed to obtain Asia (regional) GDP in nominal HK$ (column 4a). To calculate the conversion factor between the Asia and the actual HK$, divide the *nominal* regional total in HK$ by the *real* regional total with Hong Kong, China as base: column (4a)/column (5a) = column (6). For the Update, the conversion factor for GDP (μ) is equal to 0.616. This conversion factor for GDP will be multiplied for the PLIs with Hong Kong, China as base [column (7)] so that PLIs are expressed relative to Asia, column (8). Real GDPs with Asia as base (Asia = 100) in column (9) are obtained by dividing column (4) and column (8).

While the conversion factor (μ) differs from one expenditure category to another, the same approach is applied for each category. This provides meaningful analysis of real expenditures with Asia as base.

Appendix Table 4. Deriving Price Level Indexes and Real Expenditures with Asia as Base, 2009

Economy	GDP (million LCU)	Exchange Rate (LCU/HK$)	PPP (Hong Kong, China as base)	Nominal GDP (million HK$)	Real GDP (million, Hong Kong, China as base)	PLI, (Hong Kong, China as base)	PLI, (Asia = 100)	Real GDP (Asia = 100)
	(1)	(2)	(3)	(4)=(1)/(2)	(5)=(1)/(3)	(7)=(3)/(2)	(8)=(7)/(6)	(9)=([5]/[6])•100
Bangladesh	6,535,864	8.91	4.16	733,675	1,570,115	47	76	966,493
Bhutan	61,281	6.25	2.53	9,810	24,213	41	66	14,904
Brunei Darussalam	15,595	0.19	0.14	83,355	111,994	74	121	68,939
Cambodia	43,287,080	534	229.74	81,046	188,422	43	70	115,984
China, People's Republic of	34,631,660	0.88	0.64	39,296,540	54,331,621	72	117	33,444,127
Fiji	5,549	0.253	0.26	21,941	21,133	104	169	13,009
Hong Kong, China	1,622,203	1.00	1.00	1,622,203	1,622,203	100	162	998,556
India	61,484,014	6.25	2.70	9,843,031	22,735,794	43	70	13,995,142
Indonesia	5,603,871,170	1,341	730.83	4,180,021	7,667,814	55	89	4,719,965
Lao People's Democratic Republic	47,562,170	1,099	473.18	43,284	100,517	43	70	61,874
Malaysia	679,687	0.454	0.29	1,496,470	2,336,258	64	104	1,438,096
Maldives	18,854	1.65	1.42	11,415	13,297	86	139	8,185
Mongolia	6,568,403	186	94.50	35,405	69,510	51	83	42,787
Nepal	1,073,179	10.01	4.71	107,235	228,090	47	76	140,402
Pakistan	13,780,244	10.54	4.15	1,307,024	3,319,126	39	64	2,043,106
Philippines	8,026,144	6.15	3.58	1,304,585	2,240,383	58	95	1,379,080
Singapore	266,714	0.19	0.18	1,425,541	1,498,403	95	155	922,350
Sri Lanka	4,825,047	14.83	7.99	325,308	604,041	54	87	371,821
Taipei,China	12,477,181	4.26	2.98	2,925,814	4,190,945	70	113	2,579,759
Thailand	9,050,715	4.42	2.47	2,045,583	3,663,144	56	91	2,254,868
Viet Nam	1,667,482,551	2,202	950.68	757,276	1,753,993	43	70	1,079,680
				(4a)	(5a)			(9a)
Asia				**70,382,530**	**114,334,618**		**100**	**70,382,530**
Conversion factor:					**(6)=(4a)/(5a)**			
Nominal GDP for Asia/Real GDP for Asia (Hong Kong, China as base)					**=**	**0.616**		

GDP = gross domestic product, LCU = local currency unit.

Notes: The Islamic Republic of Iran and Macao, China, which participated in the 2005 International Comparison Program (ICP), were included in the 2009 Purchasing Power Parity Update for computation purposes. For consistency and comparability with the 2005 PPP benchmarks, Asia refers to the 21 participating economies in the 2009 PPP Update in Asia and the Pacific, and the Islamic Republic of Iran and Macao, China. The 2009 capital to national price adjustments for the People's Republic of China were based on the 2005 national average prices extrapolated by the ICP Regional Office and the ICP Global Office using price data for 11 cities submitted by the National Bureau of Statistics of China.

Appendix 5
Price Collection Tools

Appendix Table 5.1. Price Collection Tool Module 1. Household Final Consumption Expenditure
(Data Entry Mode)

2009 PPP Update

Country XXX — **Enter Data**

Capital City YYY

Period Q1 — **Analyze Data**

			Preferred Unit of Measure		Specified Range (for Observed Qty)		n1		
BH_Code	Pr_Code	Item Description	Preferred Quantity	Unit of Measure	Min	Max	Outlet/Loc	Obs. Quantity	Obs. Price
1101111	1101111017	Brown rice	5	Kilograms	10	10	12345	5	35,070
1101111	1101111018	White rice #1	10	Kilograms	10	10	12345	10	75,006
1101111	1101111019	White rice #2	10	Kilograms	10	10	12345	10	67,500
1101111	11011110118	Premium rice #1	10	Kilograms	5	5	12345	5	33,505
1101111	11011110120	Premium rice #3	10	Kilograms	10	10	12345	10	46,000
1101111	11011110121	Premium rice #4	5	Kilograms	10	10	13456	10	85,000
1101111 BH	**6**	**Rice**							
1101112	1101112011	Wheat flour prepackaged	1	Kilograms	0.8	1	1456	1	21,000
1101112	1101112013	Wholemeal flour (Atta)	1	Kilograms	1	1	1456	1	6,553
1101112	1101112016	Corn flour prepackaged	454	Grams	300	500	1456	300	7,010
1101112	1101112021	Cake mix	400	Grams	300	500	1456	400	17,002
1101112 BH	**4**	**Other cereals, flour, and other cereal products**							

Appendix Table 5.2. Price Collection Tool Module 1. Household Final Consumption Expenditure
(Data Analysis Mode)

2009 PPP Update

Country XXX — **Enter Data**

Capital City YYY

Period Q1 — **Analyze Data**

GRAPH		
obs	5	15
cv	0.2	0.3
min/max	0.8	0.6

Individual price quotation validation/checks

price is relatively lower compared with other quotations

price is relatively higher compared with other quotations

			Preferred Unit of Measure		Summary statistics						Converted prices
BH_Code	Pr_Code	Item Description	Preferred Quantity	Unit of Measure	Avg	Quotes	CV	Min	Max	Min/Max Ratio	n1
1101111	1101111017	Brown rice	5	Kilograms	37,012	6	4%	35,070	40,000	0.88	35,070
1101111	1101111018	White rice #1	10	Kilograms	69,585	3	7%	63,750	75,006	0.85	75,006
1101111	1101111019	White rice #2	10	Kilograms	65,000	3	3%	63,750	67,500	0.94	67,500
1101111	11011110118	Premium rice #1	10	Kilograms	64,003	3	3%	62,500	67,010	0.93	67,010
1101111	11011110120	Premium rice #3	10	Kilograms	56,167	3	13%	46,000	62,500	0.74	46,000
1101111	11011110121	Premium rice #4	5	Kilograms	42,500	1	0%	42,500	42,500	1.00	42,500
1101111 BH	**6**	**Rice**			**6**	**19**	**5%**	**0**	**0**	**0.89**	
1101112	1101112011	Wheat flour prepackaged	1	Kilograms	14,500	3	32%	11,000	21,000	0.52	21,000
1101112	1101112013	Wholemeal flour (Atta)	1	Kilograms	7,351	3	8%	6,553	8,000	0.82	6,553
1101112	1101112016	Corn flour prepackaged	454	Grams	10,091	6	6%	9,080	10,608	0.86	10,608
1101112	1101112021	Cake mix	400	Grams	14,513	6	12%	11,300	17,002	0.66	17,002
1101112 BH	**4**	**Other cereals, flour, and other cereal products**			**4**	**18**	**14%**	**0**	**0**	0.72	

Appendix Table 5.3. Price Collection Tool Module 2. Construction

2009 PPP Update CONSTRUCTION

Country **XXX**

Reference Period **2009**

Name	Product and Price Details	2005 ICP XXX		2009 PPP Update XXX		Remarks/ Comments
		LCU Avg	Obs 1	LCU Avg	Obs 1	
15.02.00.0.02	Aggregate for Concrete	2,316.67	2,316.67	523.00	523.00	
		2,316.67	2,316.67	523.00	523.00	
	Price is for Year		2006		2009	
	Price Details					
	Type: Aggregate for concrete (9 . 5 mm to 37 . 5 mm in diameter)					
	Quantity: 1.000 Cubic meter					
	Unit Cost:		2,400.00		3,556.00	
	Type: Aggregate for concrete (9 . 5 mm to 37 . 5 mm in diameter)					
	Quantity: 50.000 Cubic meter					
	Unit Cost:		2,300.00		3,950.00	
	Type: Aggregate for concrete (9 . 5 mm to 37 . 5 mm in diameter)					
	Quantity: 100.000 Cubic meter					
	Unit Cost:		2,250.00		3,789.00	
	Specifications					
	Source (Input "1" for the relevant source of price data)					
	Architect		0			
	Engineer		0			
	Average, Price Index data collection		0			
	General Contractor		1		1	
	Specialty Contractor		0			
	Other :		0			
	Comments					

Appendix Table 5.4. Price Collection Tool Module 3. Compensation

2009 PPP Update					
Compensation					
Country	**XXX**				
Reference Year	**2009**				
Product and Price Details		**13.02.21.1.101** Doctor, Head of Department	**13.02.21.1.102** Doctor, (20 years of seniority)	**13.02.21.1.103** Doctor, (10 years of seniority)	**13.02.21.1.104** Nurse, Head of Department
Average annual compensation		**553,327.35**	**485,154.82**	**428,150.68**	**460,342.47**
Number of Quotations		*1*	*1*	*1*	*1*
Average annual compensation		553,327.35	485,154.82	428,150.68	460,342.47
Comparable compensation (by hours worked)		553,327.35	485,154.82	428,150.68	460,342.47
Comparable compensation (by days worked)		553,327.35	485,154.82	428,150.68	460,342.47
Country Information					
Net hours worked per year		1,752.00	1,752.00	1,752.00	1,752.00
Net days worked per year		219.00	219.00	219.00	219.00
Number of hours worked per day (average), calculated		8.00	8.00	8.00	8.00
Details (Country Data)					
TOTAL EMPLOYEE COMPENSATION		**515,654.00**	**452,123.00**	**399,000.00**	**429,000.00**
Annual compensation of employees of which:					
Gross wages and salaries paid		**515,654.00**	**452,123.00**	**399,000.00**	**429,000.00**
Employers' contributions					
Number of regular hours worked per week (exclude overtime)		40.00	40.00	40.00	40.00
Number of days worked per week (exclude overtime)		5.00	5.00	5.00	5.00
Number of days of annual leave per year		20.00	20.00	20.00	20.00
Number of public holidays per year		21.00	21.00	21.00	21.00
Year for which data are reported (2008 or nearest year available)		2009	2009	2009	2009
Currency unit		lcu	lcu	lcu	lcu
Number of hours worked per day (average)		8.00	8.00	8.00	8.00
Comments					
Regional Base Information					
Net hours worked per year		1,880.00	1,880.00	1,880.00	1,880.00
Net days worked per year		235.00	235.00	235.00	235.00
Number of hours worked per day (average)		8.00	8.00	8.00	8.00
Details (Reference Data)					
Number of regular hours worked per week (exclude overtime)		40.00	40.00	40.00	40.00
Number of days worked per week (exclude overtime)		5.00	5.00	5.00	5.00
Number of days of annual leave per year		15.00	15.00	15.00	15.00
Number of public holidays per year		10.00	10.00	10.00	10.00

Appendix Table 5.5. Price Collection Tool Module 4. Gross Fixed Capital Formation on Machinery and Equipment—Imports Data

2009 PPP Update

Sector: **Imported Machinery and Equipment**

Country: **XXX**

Reference Year: **2009**

		c.i.f. value of imports (in national currency)	**FOB value of imports** (in national currency)	**International freight costs** (in national currency)
Total Imports	value (level)	125,397,924	69,665,513	41,799,308
	% to c.i.f. value of imports			
	% to f.o.b. value of imports		1	0.6
	% to c.i.f. value of imports	1	0.56	0.33
General and Special Purpose Machinery (HS code 84)	value (level)	69,786,965	45,612,396	12,771,471
4- Digit	% to c.i.f. value of imports			
6-Digit	% to f.o.b. value of imports		1	0.28
	% to c.i.f. value of imports	1	0.65	0.18
Electrical and Optical Equipment (HS codes 85 and 90)	value (level)	537,464	368,126	73,625
4-Digit	% to c.i.f. value of imports			
6-Digit	% to f.o.b. value of imports		1	0.2
	% to c.i.f. value of imports	1	0.68	0.14
Transport Equipment (HS codes 86, 87, 88 and 89)	value (level)	7,591,809	5,623,562	1,124,712
4- Digit	% to c.i.f. value of imports			
6-Digit	% to f.o.b. value of imports		1	0.2
	% to c.i.f. value of imports	1	0.74	0.15

Appendix Table 5.5. Price Collection Tool Module 4.
Gross Fixed Capital Formation on Machinery and Equipment—Imports Data *(continued)*

Note:

Red highlight indicates that the reported share or derived margin exceeds the maximum percentages reported for the 2005 ICP

Criteria: Custom Duties (25%); VAT and other Taxes (25%); Installation Costs (30%)

	*You may choose to input level **(yellow)** or Percent **(green)** to CIF value of Imports*			
Insurance (in national currency)	**customs duties** (value in national currency or % of total imports)	**non-deductible VAT or other product taxes** (value in national currency or % of total Imports)	**installaltion costs** (value in national currency or estimated margin in %)	**Comments**
13,933,102				
	20	12	5	
0.2	0	0		
0.11	0	0	0	
11,403,099				
	20	12	25	
0.25	0	0		
0.16	0	0	0	
95,713				
	28	12	25	
0.26	0	0		
0.18	0	0	0	
84,3534				
	26	26	35	
0.15	0	0		
0.11	0	0	0	

Appendix Table 5.6. Price Collection Tool Module 5. Gross Fixed Capital Formation on Machinery and Equipment

2009 PPP Update

Machinery and Equipment

Country XXX

Reference Period 2009

Product Code	Name	Product and Price Details	2005 ICP Asia and the Pacific			2009 PPP Update			Remarks/ Comments
			LCU Avg	Obs 2	Obs 1	LCU Avg	Obs 1	Obs 2	
15.01.12.1.01	AIR COMPRESSOR (Small)		145,000	145,000	0	8,600	8,600	0	
		Selection (Input "1" for the relevant type of brand)							
		Preferred—Atlas - Copco LE2 - 10		1					
		Unspecified Alternate							
		(Specify Type/Brand if Different from 2006)						Unspecified alternate	
							ABC		
		Price Details					40 liters		
		A. Equipment Costs (in national currency)		**145,000**			**8,600**		
		B. Installation if not included							
		C. Transportation if not included							
		D. Non-deductible tax if not included							
		E. Deductible tax if included							
		F. Sub total (B + C + D – E)		**0**	**0**		**0**	**0**	
		Specifications							
		CHARACTERISTICS (For Unspecified Alternate)							
		Motor Power (kW):							
		Pressure (bars):							
		Tank Volume (Liters):							
		Source **(Input "1" for the relevant source of price data)**							
		Distributor							
		Dealer		**1**			1		
		Expert/Consultant							
		Catalogue							
		Other:							
		Comments:							

Appendix Table 5.7. Price Collection Tool Module 6. Automatic Processing of Outputs from Price Collection Tools for ADB

Summary Table 2009 PPP Update

Country XXX

Reference Period Q1 and Q2 2009

Particulars	Q1	Q2
Total number of product priced	220	245
Not priced	49	34
Product with quotations		
1	19	12
2–5	60	74
6–10	63	69
11–14	23	26
= > 15	55	64
Product with CV = > 20%	17	37
of which:		
20 < CV <=30	17	33
20 < CV <=40	0	2
20 < CV <=50	0	1
CV > 50	0	1
Product with minimum/maximum ratio < = 0.6	27	49

Appendix Table 5.8. Price Collection Tool Module 7. Gross Domestic Product Expenditures (Data Entry Mode)

2009 PPP Update
Gross Domestic Product, Levels in Billion Local Currency Unit
Country: XXX

		2009 PPP Update (Please input GDP [billion] and population [million] for available years)			
Particulars	**XXX**	**2006**	**2007**	**2008**	**2009**
GDP (in billion local currency units)	**4,011.70**				1,508,096
Population (in million)	**156.00**				178
Checking	–	–	–	–	–

Code	Description	2005 ICP Asia Pacific	2009 PPP Update (Please input levels [in billion LCU])			
			2006	2007	2008	2009
100000	**GROSS DOMESTIC PRODUCT**	4011.70	0	0	0	1,508,097
110000	**FINAL CONSUMPTION EXPENDITURE BY HOUSEHOLDS**	3000.47	0	0	0	766,892
110100	**FOOD AND NON-ALCOHOLIC BEVERAGES**	1598.75	0	0	0	474,994
110110	**Food**	1591.21	0	0	0	474,984
110111	*Bread and cereals*	741.75	0	0	0	203,244
1101111	*Rice*	655.20				82,745
1101112	*Other cereals, flour and other cereal products*	45.73				71,945
1101113	*Bread*	3.12				5,362
1101114	*Other bakery products*	12.71				1,956
1101115	*Pasta products*	24.99				41,236
110112	*Meat*	107.00	0	0	0	104,520

Appendix Table 5.9. Price Collection Tool Module 7. Gross Domestic Product Expenditures (GDP Weight Computation Mode)

2009 PPP Update
Gross Domestic Product, Levels in Billion Local Currency Unit
Country: XXX

Particulars	XXX	2006	2007	2008	2009
GDP (Pecent Share)	**100.00**				**100**
Checking	–				–

Code	Description	2005 ICP Asia Pacific	2009 PPP Update			
		XXX	2006	2007	2008	2009
100000	**GROSS DOMESTIC PRODUCT**	100.0	0	0	0	100
110000	**FINAL CONSUMPTION EXPENDITURE BY HOUSEHOLDS**	74.3	0	0	0	50.85
110100	**FOOD AND NON-ALCOHOLIC BEVERAGES**	38.8	0	0	0	31.49
110110	**Food**	38.6	0	0	0	31.49
110111	*Bread and cereals*	17.2	0	0	0	13.47
1101111	*Rice*	15.0	–	–	–	5.48
1101112	*Other cereals, flour and other cereal products*	1.2	–	–	–	4.77
1101113	*Bread*	0.1	–	–	–	0.35
1101114	*Other bakery products*	0.3	–	–	–	0.12
1101115	*Pasta products*	0.6	–	–	–	2.73
110112	*Meat*	2.6	0	0	0	6.93

Appendix 6
Economy Experiences in the 2009 Purchasing Power Parity Update

Introduction

The section describes the economies' experiences and comments on their participation in the 2009 purchasing power parity (PPP) Update. Capacity building is acknowledged to be one of the significant outcomes of the Update. The creation of special groups by the national implementing agencies, to attend to Update matters, was also a major factor in ensuring the successful implementation of the Update at the economy level. With the improved understanding of PPP concepts and techniques, there is an expressed need for the conduct of PPP advocacy activities at the national level. The validation techniques of the Price Collection Tool (PCT) were adopted for consumer price index (CPI) compilation resulting in more reliable CPIs. The attempt in some economies to integrate price collection for the Update and the CPIs to take advantage of the expertise of the CPI price collectors and minimizing cost is also notable.

Bangladesh

The Price and Wage Section of the National Accounting Wing, Bangladesh Bureau of Statistics (BBS), implemented the Update with the director of the National Accounting Wing as the national coordinator and the director general overseeing all activities.

The staff responsible for the CPI of the Price and Wage Section collected price data for 229 household items from 13 markets in the capital, although the timing of the 2009 price surveys did not coincide with the CPI surveys. About 21% of items in the CPI basket were included in the 2009 PPP Update list. Prices were validated against the 2005 International Comparison Program (ICP) prices and 2009 CPI prices for the same or similar products in the CPI. Issues raised during the regional data validation workshops were verified through field visits.

Private consumption expenditure in the gross domestic product (GDP) is derived residually. Household consumption expenditures were disaggregated using Household Income and Expenditures Survey results. A special survey was conducted for the non-profit institutions serving households, while administrative records were used for government consumption and balance of payments.

No major difficulties were encountered in undertaking activities for the Update, except for the pricing of machinery and equipment items, which was also undertaken by staff of the BBS. In the 2005 ICP round, the machinery and equipment items were priced with the assistance of an expert in this field.

The BBS found the PCT user friendly. The two missions conducted by the Asian Development Bank (ADB) helped clarify issues related to the subnational PPP computation in Bangladesh. PPP advocacy activities in Bangladesh would definitely benefit policymakers.

Bhutan

The National Statistical Bureau (NSB), the national implementing agency for the Update in Bhutan, has six major divisions, one of which is the National Accounts and Price Division. This division has two sections, the National Accounts and Price Statistics. The Price Statistics section head was the national coordinator. No advisory group was established to assist the national coordinator but experts were consulted.

While the overlap between the CPI and 2009 household product list was about 40%, the CPI infrastructure was not used for the PPP updating exercise because of differences in the schedule of price collection. CPI prices are collected by the respective district statistical officers, whereas prices for the Update were collected by

the head office. A maximum of 19 outlets were surveyed for some household items, while only one outlet was used for items where a single price quotation would suffice such as airfares, water and electric services, and postal services. A few household and machinery and equipment items were priced outside the capital city. NSB did not engage any domestic expert for machinery and equipment but expert opinion was sought for technical clarifications from engineers. It would be advisable to engage domestic experts who can help in pricing machinery and equipment items.

Initially, results of the 2009 price surveys were not compared with CPI prices because different sets of staff collected the prices. However, on realizing that similar items could be compared to verify price movements, the 2009 Update prices were compared with the 2009 CPI prices. The 2009 prices were also compared with the 2005 ICP prices as a way of validating whether the same products were being priced. Almost all the products priced in 2005 were still available in 2009 in Bhutan. The 35% increase in the salaries of civil servants, with the first parliamentary democratic election in 2008, explains the substantial movement in the compensation of government services. Disaggregation of the major GDP aggregate on household consumption was based on the expenditure items listed in the Bhutan Living Standards Survey 2007 and matched accordingly with the ICP basic headings, although a few problems were encountered in this activity. The regional data validation workshops were also very useful as venues for discussing issues in price collection and in explaining the situation in specific economies.

The NSB organized an ICP Dissemination Conference in June 2011 to encourage knowledge and interest in the uses and importance of PPP-based information. Participants included policymakers, economists, and officials from ADB and the ICP Global Office at the World Bank.

From the Update, the benefits gained by the NSB were immense and useful for improving the CPI, especially in validating data. In addition, the PCT was very useful and a similar program was developed for the CPI.

Other comments and suggestions include: (i) a method to include government-regulated products (for example, kerosene in Bhutan) should be developed to capture the real price situation in the price level index; (ii) price collectors should attend the review workshops as they know the actual situation in the field and would be in the best position to respond to price data issues; (iii) an integrated CPI-ICP survey could be done as this will be useful for the head office and statistics officers at the district level. Respondent burden, in terms of providing prices for the CPI and the ICP, which is a problem in Bhutan, can also be addressed.

Brunei Darussalam

The Department of Statistics (DOS) is one of six departments under the Department of Economic Planning and Development, Prime Minister's Office in Brunei Darussalam. DOS has three divisions: the Real Sector, External Sector, and Social Statistics. The Real Sector Division is further divided into the National Accounts and Prices sections. The Prices Section compiles the CPI and implemented the regional technical assistance (RETA 6482),[4] with its head as the national coordinator. An ad hoc working group headed by the Real Sector Division assistant director with DOS senior officers as members was formed to assist the national coordinator.

For the Update, the CPI infrastructure was used for price collection activities. About 10% of the 2009 household items overlapped with the CPI list and were used for the Update. The advantage of using the CPI infrastructure was that the staff members were familiar with collecting prices and in identifying the correct items according to the specifications. However, CPI staff encountered additional workload since most of the CPI and ICP items did not match. Additional staffs from other sections of DOS were also assigned to help the CPI staff. On average, about 9 to 12 outlets were surveyed for the 2009 prices of household products.

Similar items in the CPI and the Update were compared to validate price movements. Likewise, most of the 2009 prices collected were compared with those collected for the 2005 ICP surveys to check whether the same or similar products were priced. The regional data validation workshops were very useful for discussing

4 ADB. 2009. *Regional Technical Assistance for Improving Price Collection of Non-Household Expenditure Components and Updating Purchasing Power Parity Estimates for Selected Developing Member Countries*.Manila. http://beta.adb.org/data/icp/reta-6482-background.

and addressing issues in price collection faced by each economy.

Only a few products priced in 2005 were no longer available in 2009. The increase in oil prices affected the prices of imported goods in 2006 and 2007, and products are mostly imported in Brunei Darussalam. Prices were collected from authorized distributors of the relevant machinery and equipment. For future equipment price surveys, a domestic expert must be engaged.

It would be useful to have PPP advocacy activities. At the moment, DOS feels that their users do not really understand what PPPs are and how these can be used for policy making.

DOS's participation in the Update was beneficial for its officers directly involved in the project. The knowledge and experience gained is vital in improving price collection activities. The project also introduced DOS officers to a network of regional counterparts whom they can communicate with for further discussion on related issues. For better CPI-ICP surveys integration in the future, it is important that the CPI and ICP lists match and the pricing period be the same. The PCT was user friendly and simple to understand.

Cambodia

To implement the Update, the National Institute of Statistics (NIS) created a working group led by the NIS director general, with members from the Prices Statistics, National Accounts, and Information Technology sections.

The CPI infrastructure was used to collect prices of products in the Update that are similar to the CPI, which is about 14% of the 2009 household items. About 85% of the products in the 2005 exercise were still available in 2009. The household price surveys were conducted in the cities of Battambang, Kampong Cham, Kandal, Phnom Penh, Siem Reap, Sihanoukville, which is the same coverage as in the 2005 ICP. Surveys were made only for urban areas with outlets such as open markets and small retail shops, with a maximum of 30 quotations for each household item. The construction, and machinery and equipment price surveys were conducted only in Phnom Penh.

The first step in validating data was to compare the prices for the Update with that of the same or similar products in the CPI. The 2009 prices were also compared with the 2005 ICP prices.

The NIS encountered difficulties in deriving GDP expenditures for 155 basic headings. Socioeconomic surveys for 2004, 2007, and 2008 were used to derive the detailed expenditures.

The NIS suggests that ADB as the regional coordinating agency should continue training staff in the Asia and Pacific region for the ICP. Collecting prices for the Update will be helpful for future work on PPPs. The NIS found the PCT to be user friendly for data entry and validation, and suggests that it be further improved because it will be very useful for future ICP rounds.

NIS staff collected prices for machinery and equipment, but found it difficult to find exactly the same model and specifications. The 2009 and 2005 prices were compared for data validation.

Overall, participation in the Update was advantageous to the NIS as it further honed expertise for ICP price collection not only through actual field experience but also from the experiences of the other participating economies. It would be beneficial to conduct PPP advocacy activities for policymakers in Cambodia.

People's Republic of China

A special group was created within the National Bureau of Statistics of China (NBS) to oversee the Update activities in the People's Republic of China (PRC). The group included several management levels, as follows: ICP leading group within NBS, ICP Implementing Office of NBS, and the Beijing Office. The leading group, headed by a deputy commissioner, was the chief policy making body. Members included the directors general from the Department of International Cooperation, Department of Statistical Design and Administration, Department of Comprehensive Statistics, Department of National Accounts, Urban Survey Organization of NBS, Rural Survey Organization of NBS, and the International Statistical Information Center. The leading group's main responsibilities were to provide guidance on national goals, priorities, and objectives, and to monitor and

guide work programs prepared by the ICP Implementing Office of NBS. The ICP Division, established in the International Statistical Information Center under the NBS, designed the surveys, aggregated data, translated, and implemented the technical assistance for the Beijing Office. The office also coordinated with international organizations (including ADB and the World Bank), and undertook the day-to-day activities required for the Update. The Beijing Office collected and processed data on prices.

The PRC used its CPI survey organization to collect prices for the Update. Outlets used in the price surveys were mainly the existing CPI outlets. Thus, in most cases, price collectors collected both CPI and the Update prices during the same visit to the same outlet, thus saving time and costs, and assured the quality of the data. The CPI infrastructure is the best system for price collection in the PRC as CPI price collectors have extensive experience in price collection activities.

The Update list differed from the CPI basket, requiring additional price collection. About 30% of the CPI items were included in the Update, with the rest of the products collected from special surveys. As the Update price surveys required that both rural and urban areas of Beijing be covered, a special training was organized, as CPI price surveys in Beijing do not include rural areas. A total of 213 household products were priced in Beijing.

Data were validated at three levels: city (Beijing), national (the PRC), and regional (the Asia and Pacific region). In Beijing, price data were validated after data collection to ensure that the correct products were priced with the appropriate number of price observations. At the national level, data were validated following the recommendations of ADB after the price data were consolidated and submitted by the Beijing Office. Data review workshops, market survey and research, experts' estimations, and telephone verifications were also used in reviewing price data. NBS also organized review workshops to assess if the prices were correctly collected based on product specifications.

Only a few product specifications changed between 2005 and 2009. For example, "85 to 90 octane unleaded petrol" priced in 2005 was no longer available in 2009, with its sale having been banned in Beijing since 2008. NBS did not engage a domestic expert to help with machinery and equipment pricing.

For the Update, price collection for household products was held only in Beijing. The biggest difficulty encountered in computing the PRC's capital to national price ratios based on the 2005 ICP data was the PRC's 11-city participation in 2005, and the fact that it is a large and geographically diverse economy. There were issues as well in computing the price ratios of Beijing to the national level based on national CPIs as these do not cover rural areas, while ICP surveys require price collection in both urban and rural areas.

GDP compilation by expenditures is not as well established as that of the production approach. Thus, GDP expenditures are published for only five major categories. The 2009 levels were disaggregated into the required number of basic headings based on national household income and expenditure surveys, and government expenditure data.

In general, the PCT was simple and easy to use with various functions to meet various data processing needs. For further improvement, advanced functions such as computing price ratios between different areas may be added.

PPP advocacy activities in the PRC would be useful. At the economy level, PPP theories and practices can be introduced into the interregional comparison within the economy. In assessing the possibility of computing subnational PPPs for the PRC, the percentage of overlap in the CPI list across provinces and/or regions was not high, although there may be more overlaps in food products across provinces and/or regions than in the other groups. As in the other geographically diverse economies, subnational PPPs will be useful for research and policy making regarding poverty, government subsidies, and transfer payments.

The benefits gained from the Update experience include:

(i) **Increased economy level knowledge and enhanced statistical capabilities.** The implementation of the Update in the PRC strengthened the statistical capabilities of the NBS. This also gave the opportunity to improve the PRC's statistics to acceptable international standards. Moreover, training provided on survey methods, data validation, and estimation of average prices and subnational PPPs further improved statistical knowledge.

(ii) **Strengthened CPI program.** Some of the products in the Update were collected through special surveys, which effectively increased the coverage of CPI price surveys.

Fiji

The Consumer Price Index Section of the Fiji Bureau of Statistics (FBOS) implemented the Update activities, with the head of the CPI Section as the national coordinator. No formal advisory group was established, but top management acted as advisors to the Update team. The CPI infrastructure was partially used for price surveys for the Update, with 126 products in the 2009 household list available in the CPI.

The number of products available in 2009 was less than half (43%) of that in 2005. The most difficult issues that were carefully considered were items such as rice, which had more than one variety. The 20% devaluation in the Fiji dollar as well as fluctuations in petrol prices affected price movements. The Update prices were compared with CPI prices for products included in the CPI list, and those in the 2005 ICP data. Data issues raised at the regional validation workshops were investigated in the field as needed.

While the FBOS did not integrate the Update price surveys with the regular CPI price survey, integration of the two surveys would be very helpful in the future compilation of PPPs.

The Update provided the opportunity to gain new ideas especially in collecting data. Learning about the aspects of price relatives between economies and the link between ICP and CPI was useful. The importance of CPI rebasing became apparent with the wide range of new items available in the outlets. The FBOS also found the PCT easy to use. It would be very useful to have an advocacy meeting in Fiji as this would allow stakeholders and policymakers to be informed about the importance and uses of PPPs.

Hong Kong, China

The Census and Statistics Department collected the Update prices in Hong Kong, China, supervised by an assistant commissioner, who was also the national coordinator. A team of 10 professional and subprofessional staff from the Department's Price Statistics and National Income Branches were involved. The 2009 price surveys were integrated into the regular retail price surveys, which collect CPI price data for optimum efficiency and cost effectiveness. Prices for about 44% of the household consumption items required in the Update could be directly extracted from the CPI database. Moreover, Update items not included in the retail price surveys were collected through the same survey to make use of the experience and product knowledge of staff engaged in the retail price surveys, and in the same outlets already covered in the CPI as far as possible to minimize efforts in outlet selection and data collection.

The survey collected price data for 224 household consumption items throughout Hong Kong, China covering both urban and rural areas. Price data were collected from different outlet types, such as wet markets stalls, groceries, small shops, supermarkets to department stores. Prices for construction, and machinery and equipment were not integrated in the CPI surveys and prices had to be collected separately.

All data were thoroughly checked before submission to the ADB. In particular, product specifications were checked to ensure they exactly matched the Update specifications. Moreover, the price level of individual products and price movements of related items were checked to identify possible outliers. As 2009 price data for the same items in 2005 were collected, they were compared with the 2005 ICP prices for further validation. In addition, price movements of household consumption items collected for ICP were compared with price movements of similar products in the 2009 CPI, to detect any abnormal price changes caused by possible outliers or extraordinary events.

The same items as in the 2005 ICP were priced as far as possible. While majority of the items (or items comparable with 2005) were still available, a few items priced in the 2005 round had become obsolete. For clothing and footwear, it was not possible to price exactly the same items in 2009 as in 2005 but efforts were made to identify items satisfying the product specifications of similar quality as in 2005.

While Hong Kong, China used the CPI survey framework in the ICP data collection and extracted the price data directly from the CPI database as far as possible, about

50% of the items did not overlap, for which additional surveys were conducted.

In mapping the 155 basic headings with the existing expenditure breakdowns of Hong Kong, China's GDP data were available for most of the basic headings. In cases where the expenditure items were relatively less significant, estimates were based on information from the latest 2004/05 Household Expenditure Survey and imports statistics with detailed commodity breakdowns.

Participation in the Update exercise was found to be a valuable experience, and is a useful bridge between the 2005 and 2011 ICP rounds. It also provided the forum for the price statisticians to exchange experiences and views on price statistics, and to increase understanding of the price surveys in other economies. The PCT was easy to use and provided useful data diagnostics to alert users on possible outliers.

India

The Prices and Cost of Living Unit, National Accounts Division of the Central Statistics Office, under the Ministry of Statistics and Programme Implementation, collected, validated, and analyzed data; and coordinated with various agencies for the Update activities. The National Accounts Division is headed by an additional director general, who was designated as the national coordinator. The Field Operations Division of the National Sample Survey Organization carried out the household price surveys. Construction prices were collected in cooperation with the Ministry of Urban Development, while machinery and equipment data were compiled by the Department of Industrial Policy and Promotion.

The CPI infrastructure was used to collect prices for household consumption items. As specifications of the Update list were quite different from that in the CPI for many items, a separate schedule for the 2009 list was used. For household consumption items, two different sampling schemes were adopted for computing national average prices. Household price surveys were conducted once every month in each quarter, with food, clothing, footwear, and education priced in 39 locations in New Delhi, and the other products surveyed in 6 locations in New Delhi. A total of 211 products were priced in New Delhi.

The prices of some products with generic specifications varied significantly because of the availability of large varieties that satisfied the given specification structure. Therefore, India's prices may be correct but not necessarily the average prices. The problem was quite pronounced due to a smaller sample size for this updating round. Thus, it was not useful to compare the 2009 prices with the 2005 ICP benchmark prices.

For most of the items, comparing prices between the 2005 and 2009 products was very difficult due to unavailability of exactly the same products in 2005 and 2009, especially for electronic products and household appliances. It was also difficult to compare prices for items having generic and/or loose specifications, particularly clothing and cereals, as it was not feasible to price the same product as in the 2005 ICP.

Integration of the CPI and ICP price surveys would reduce data collection costs, and possible subjectivity and biases in the ICP data as the data will be used in the national statistical activities. This may eventually lead to more robust and credible PPP data. However, as the common items having the same specifications in both these price surveys are very few, it is not feasible to integrate CPI and PPP price surveys unless the ICP continues on a regular basis.

Estimates of disaggregated household consumption expenditure were derived for all the 110 basic headings of household consumption based on a detailed concordance of private final consumption expenditure items and the required basic headings. The results of the Consumption Expenditure Survey, Annual Survey of Industries, and ratios from the 2005 ICP were also used to derive the 2009 basic heading level expenditures for the other GDP expenditure groups.

The PCT was user friendly and found to be very helpful in analyzing and validating data. However, the software may not be very effective for large sample data.

The PPP updating methodology also needs to be reviewed owing to severe limitations in the availability of data particularly for machinery and equipment. It is also suggested that to have users' confidence, the 2009 PPPs must be analyzed, i.e., whether results are consistent with other related indicators such as inflation rates, change in exchange rates, etc.

Indonesia

The Price Statistics Directorate of the Badan Pusat Statistik (BPS) was responsible for the Update activities in Indonesia. The Director of the Price Statistics Directorate was the national coordinator and was selected on the basis of being knowledgeable in price and national accounts.

Quarterly price collection was conducted in Jakarta for 270 items from wet markets, department stores, drugstores, and service providers. In addition, prices from the CPI surveys were used when the CPI product specifications matched those of the Update. This facilitated price collection and increased the number of price quotations for the 2009 list. As recommended for data validation, BPS compared the 2009 prices with the same or similar products in the 2009 CPI and the 2005 ICP prices.

BPS also found the regional data validation workshops quite important in ensuring that the correct products were priced. The PCT was very easy to use. However, it should be configured to handle higher capacity for data processing. Overall, participation in the Update further enhanced knowledge in the other applications of PPP concepts. PPP advocacy activities in Indonesia would be very useful but it would also be beneficial if PPP calculation could also be covered.

The National Accounts Directorate of BPS did not encounter major difficulties in disaggregating the 2009 GDP expenditure into the required 155 basic headings.

Lao People's Democratic Republic

The Lao Statistics Bureau (LSB) led the Update activities, with the Economics Division coordinating data collection and validation. The Technical Advisory Working Group, chaired by the director general, was created to supervise overall implementation. The national coordinator also worked with the team in carrying out the 2009 price surveys, and also other necessary data compilation using the PCT. The regional work plan was integrated into the national plan for ICP implementation. Regular coordination and communication (through e-mail and phone calls) were established with the regional technical team at ADB.

CPI infrastructure was used in the 2009 price data collection where applicable. However, as not all items from the ICP product list were available in the CPI data collection, additional data were collected. For the health and education price surveys, the LSB cooperated with the Ministry of Health (Department of Food and Medicine Management) and the Ministry of Education for the surveys. For machinery and equipment and for construction, LSB involved the Ministry of Transportation, Construction, and Communication and some construction companies. For the compensation of government employees, LSB coordinated with the Ministry of Finance.

The household price surveys were conducted in four wet markets and seven supermarkets in the capital city. About 18 price quotations were collected for each of the household goods and services prices. There was an overlap of 26% between the products in the Update and those in the CPI.

The 2009 prices were compared with the price movements of similar products in the CPI and also with those in the 2005 ICP price surveys. A technical training on data validation was conducted for data supervisors and data collectors before the start of field work. Prices were initially verified manually by price collectors and supervisors, and examined at LSB before data entry to check whether they conformed to the product specifications to minimize non-sampling errors (price and/or product errors) and to compare them across markets. In summary, the validation followed the PCT guidelines. There were no major changes between 2005 and 2009 in terms of product availability and specifications.

In implementing the price surveys, LSB attempted to integrate the Update price surveys with the regular CPI price surveys where possible. However, not all items from the ICP product list were available in the CPI list. The ICP provided practical experiences in defining product specifications, price collection, validation, and data review, which have improved the CPI coverage and quality. Starting in January 2011, the CPI data collection coverage expanded from 8 to 12 provinces with the product list increasing from 181 to 245 items.

Rather than engage a private domestic expert, LSB engaged a specialist from the Ministry of Construction

and Transportation to help collect prices for machinery and equipment. During the validation process, LSB discussed with some private companies whether there were issues regarding the price comparisons. An issue in pricing machinery and equipment was the country of origin of the item.

For the 2009 compilation of weights from GDP expenditure, the national coordinator coordinated with the National Accounts Unit. As official GDP expenditure data for 2009 were not available, an attempt was made to compile these for 2007 based on the Lao Expenditure and Consumption Survey. To finalize the preliminary estimate, the National Accounts Unit will require additional intensive technical work to resolve data discrepancies, inconsistencies, and analyze trends compared to the 2005 GDP expenditures. Government expenditure also needs to be revised according to the final estimates from the Ministry of Finance. The timing for publication of the ICP 2009 results was a concern, so the 2009 updated nominal expenditures was disaggregated using the same component shares as in 2005.

LSB considers it advantageous to engage a national expert to help collect data and validate product prices for machinery and equipment. If possible, the national expert may also participate in the regional workshop for discussing and validating equipment prices.

The team had a good experience in using the PCT. The Update experience improved capacity and contributed to the development of price and national accounts statistics. The practical experience gained in defining product specifications, collecting prices, and validating and reviewing data improved the CPI coverage and quality. The problems of deriving the GDP expenditures for 155 basic headings provide a very clear data gap, and implementation of the 1993 System of National Accounts is needed and appropriate investment in data collection is also required.

It would be very useful to have PPP dissemination and advocacy activities at the national level to discuss the use of PPPs for policy making. In addition, analytical capacity is needed for a technical advisory group and other stakeholders to assure the in-depth understanding of PPPs and their uses at the national level.

Malaysia

The Price Division in the Department of Statistics (DOS) was responsible for the Update activities. The director of the Price Division was the national coordinator and was assisted by four staff members. The product prices were collected as follows:

(i) **Household items**. Price collection was done by the Kuala Lumpur State Statistics Office with assistance from the Selangor State Statistics Office (for items not available in the capital city).
(ii) **Compensation**. Compensation data for government was obtained from the Malaysian Public Service Department and Armed Forces.
(iii) **Machinery and equipment**. Price data was collected via telephone and internet as well as field work conducted by staff from the headquarters.
(iv) **Construction**. Price collection was assisted by the Construction Industry Development Board Malaysia.

About 96% of products priced in 2005 were still available in 2009 but specifications have slightly changed, especially in terms of the brand, size, and quantity. The price data were collected directly by visiting the selected outlets, except for the services items where prices were collected by telephone. Prices for market and/or perishable items were collected weekly, while prices for nonperishable items were collected monthly. Rental on dwelling was collected quarterly. The overlap between the CPI and Update items was about 20%. For 2009 items not in the CPI, prices were collected monthly or weekly, consistent with similar items in the CPI price collection. The advantage of using this approach is that the CPI item can be collected at the same time as the items in the 2009 product list and from the same outlets as far as possible so that time and cost factors are minimized. On average, a maximum of 21 outlets in Kuala Lumpur were surveyed for household products. In addition, 11 outlets were also covered in Selangor state for two products that were not available in Kuala Lumpur.

The Price Statistics Division in DOS headquarters validated and checked the prices submitted from Kuala Lumpur and Selangor before submitting these to ADB. The trend of the price movement in the CPI was used as the basis to check prices collected for the same items in

the ICP. A comparison was also made against the 2005 average prices. To address price data issues raised by ADB, a meeting was arranged with price collection staff. Action taken was to review the problem items with prices either too high or too low and to confirm these prices from the field work.

Data on government compensation showed a major increase due to revisions in the government salary scales in early 2008.

DOS did not encounter difficulties in computing the required details for the national accounts basic heading weights for all the major national accounts aggregates: household consumption, government consumption expenditure, and gross fixed capital formation. The annual household consumption expenditure estimates in the Malaysian national accounts is compiled using COICOP classification and at sufficient detail to meet the Update needs. The Household Expenditure Survey is the main data source in disaggregating data by basic headings for household final consumption expenditure. Gross fixed capital formation is estimated using the Malaysia Classification of Product by Activity and based on domestically produced and also imported capital goods. Government consumption expenditure is compiled using the COFOG classification and detailed information is available from government administrative records.

DOS did not engage a domestic expert to collect prices for machinery and equipment but many items were no longer available in 2009.

The Update helped prepare DOS for the 2011 ICP. Regional workshops were valuable in increasing understanding of PPPs and in analyzing price data. While the PCT was found simple to use, it was also found not very suitable in capturing a large number of price quotations in Malaysia's case. PPP advocacy activities in Malaysia would be useful for policy making.

Maldives

The Price and Economic Statistics (PES) Unit under the National Accounts and Economic Statistics Section in the Statistics Division, Department of National Planning, was responsible for the Update in the Maldives. Due to staff constraints in the PES unit, price collection was carried out with the National Accounts and Survey Units. The PES head was the national coordinator.

The Update and CPI price surveys were conducted simultaneously for food items, thus minimizing survey cost and time. The 2009 price surveys required extra commitment on top of the current tight workload but the Statistics Division managed to integrate some of the 2009 items in the CPI price collection, although separate forms were used.

The number of outlets covered for the household price surveys ranged from only one outlet for products that were not likely to vary much such as motorcars and other financial services to a high of 36 outlets for shoes and other footwear. The outlets included small retail stores, department stores, supermarkets, and specialized outlets such as chemists, garment retailers, schools, and private clinics, for 161 products. A minimum of five quotations was targeted for each household product, but in many cases this was not possible given the size of the economy.

Initial data validation involved checking for price consistency throughout the economy and cross checking with CPI prices, where possible, and the 2005 ICP price data. Data were verified through telephone and in the field to check for possible errors. The product specifications of the items priced were examined to ensure that they exactly matched the 2009 specifications. Moreover, the price level of individual products and relative prices between comparable items were checked to identify possible outliers. References were made to indicators such as "coefficient of variation" and "minimum to maximum price ratio" of individual items in performing these validations. The data review workshops were valuable in providing a better understanding of data validation. Usual price changes were also verified with respondents, especially if they fell outside predefined limits of plus or minus 20%–30% of the previous observed price.

In response to data issues and concerns raised during the workshops, further verification and clarifications were made with the respondents to ensure that the specifications and prices were correct.

As the economy depends on imports, most of the 2009 products were different from those in 2005, especially for clothing, even if 95% of the products priced in 2005 were still available in 2009. Thus, it was nearly impossible to follow the same brands as those in 2005, but close substitutes were priced.

As the Maldives only estimates GDP from the production approach, GDP expenditures at the basic heading were unavailable. Due to unavailability of adequate data, problems were encountered in the computation of details required for the Update. Also, lack of staff with adequate knowledge and skills made the task more difficult. Thus, GDP expenditure was disaggregated for the required basic headings using the 2005 GDP expenditure structure.

The PCT was useful and extensively used in the exercise. However, largely due to the different versions of PCT, the data were entered twice in some quarters. Problems were encountered at the initial stage but were resolved during the review workshops. The staff of the National Accounts and Price and Economic Statistics Units enhanced their technical knowledge in price collection, data validation, and GDP expenditures estimation by participating in the Update activities.

There is a dearth of reliable statistics for decision making in the economy. Hence, advocacy workshops and meetings to familiarize policymakers on the use of PPP-based GDP indicators would be very useful in the Maldives.

Mongolia

The National Statistical Office (NSO) in Mongolia formed a group of 16 staff under the director of the Macro Economic Statistics Department (also appointed as the national coordinator) to implement the Update.

A training workshop for product definitions and the product catalogue was organized for 15 price collectors. Members of the working group collected prices for 233 household consumption products from six central districts of the capital city in March, June, September, and December of 2009. Prices of 224 products were collected in the first quarter. After the first data evaluation meeting, an additional nine products were included for pricing in the second, third and fourth quarters. In the case of Mongolia, most of the products selected for the Update were not included in the CPI. As a result, CPI prices could not be used for the Update and additional price survey had to be conducted. The NSO engaged regular working staff to undertake the surveys.

The price survey for construction products covered the main districts (Bayangol, Bayanzurkh, Songinokhairkhan, Sukhbaatar) of the capital city, with prices collected from construction companies and outlets that sell construction materials. It was not possible to collect several prices for machinery and equipment because there is only one dealer or distributor in Mongolia for many equipment items and they did not carry all the equipment items.

Data on government compensation were obtained from the Civil Service Council of Mongolia.

GDP was estimated using the expenditure approach, with details prepared for 155 basic headings, although classifying expenditures by COICOP was difficult.

The project was helpful as the NSO benefited from the methodological recommendations and guidelines including those for developing product definitions, collecting and evaluating data, and entering data for submission to the regional office provided by ADB.

Nepal

The Price Statistics Section under the Economics Statistics Division of the Central Bureau of Statistics (CBS) was responsible for the Update activities in Nepal. The director of the Price Statistics Section was the national coordinator. No advisory group was established to assist the national coordinator but meetings with stakeholders and experts were organized to improve the price surveys. CPI compilation is the responsibility of the Central Bank of Nepal, whereas PPP updating was conducted by the CBS. Therefore, the CPI infrastructure was not used for the Update.

Prices were collected from the capital city of Kathmandu for 217 household items with a target of pricing each household item from 10 outlets, where possible. For validation purposes, the 2009 prices were compared with the price movements of similar products in the CPI and the 2005 ICP prices. Data issues and concerns raised

at the regional data validation workshops were verified in the field as needed.

Most of the products priced in 2005 were still available in 2009. However, as expected, major changes due to technological advances were observed for electronic goods, and machinery and equipment. The political situation in Nepal may have affected price movements.

More recent surveys were not available for deriving the required basic heading expenditures. Thus, the same structure in 2005 was used to disaggregate the 2009 expenditures on GDP.

From the Update, CBS gained knowledge in many facets of price statistics especially since it is not involved in CPI compilation. Thus, its involvement in collecting prices, processing and validating data, and computing PPP contributed much in providing technical knowledge on CPI activities. The PCT was found to be a user friendly software, but an upgrade to handle larger volumes of price data is recommended.

The harmonious relationship between the national coordinator and the ADB team contributed much to the success of the project implementation in Nepal. It would be useful to have PPP advocacy activities for policymakers. CBS planned to conduct advocacy meetings but could not arrange one due to financial constraints.

Pakistan

The Pakistan Bureau of Statistics (PBS) was the national implementing agency in Pakistan, with the director of the Statistics Division as the national coordinator. In view of the significance of the Update, the FBS constituted a review committee to help the national coordinator validate the data. To further ensure data quality, an officer experienced in the 2005 ICP activities was assigned to oversee field enumeration activities.

The CPI infrastructure was not used for collecting prices in the Update. Price collection for 242 household consumption items was conducted in Islamabad and its adjacent city of Rawalpindi since about half of the Islamabad population go to Rawalpindi for marketing.

For data validation, the 2009 household prices were compared with the same or similar products in the 2009 CPI. No major issues regarding the prices of household products were raised during the regional data validation review workshops.

Collecting prices for machinery and equipment was not an easy task for regular price collectors. Hence, a domestic expert was consulted frequently to accurately identify the prices for machinery and equipment.

Disaggregating the 2009 GDP expenditures for 155 basic headings was a difficult task. However, the deployment of the national coordinator who has expertise in analytical work and practical experience in analyzing data from different kinds of surveys made it possible to work out the basic heading values.

The 2009 PPP updating exercise enhanced the capability of the PBS ICP team who was keen to learn the significance of PPPs and utilization of PPP-based data.

Philippines

The National Statistics Office (NSO) was responsible for the Update in the Philippines. The chief of the Economic Indices and Indicators Division (EIID) of the Industry and Trade Statistics Department was the national coordinator. This is the same division that compiles the CPI.

While the same CPI structure and resources were used for the 2009 price collection, separate surveys were undertaken due to differences in items to be priced, sample areas, and outlet coverage. Integration of these price surveys would be ideal to minimize the cost of survey operations. For the more difficult sectors of construction and equipment, NSO consulted associates in the construction industry and other professionals in the field of construction who are regular users of the construction materials price indexes generated by the EIID.

To ensure that the same products based on the regional product list would be priced throughout the economy, NSO prepared its own manual and catalogue for price collection. The catalogue included pictures, and a national brand for some of the products (especially clothing) was selected for comparability in all the sample outlets. For items that were more difficult to

price such as seafood, price collection time was set, as well as the suggested size and number of items per kilogram. This was to ensure that products of similar quality were priced across the national capital region (NCR). A half day to one day briefing was done before the survey period during each quarter to prepare the staff for the price collection activity.

The same CPI sample outlets were covered by the 2009 updating surveys but outlets were added to satisfy the requirement on the number of quotations per product. Prices were collected for 235 products from at least 17 outlets per household item in the NCR and 18 outlets in a city outside of NCR for items that were not available in NCR. About 36.4% of the CPI items overlapped with the 2009 list.

Validation procedures for manual and machine processing of price data were prepared by EIID. Price quotations that were outside ±15% from the mean price in the 27 areas were not included in the computation of average prices. Price trends across the outlets within a quarter, as well as across quarters, were scrutinized for outliers and reinvestigated if these price variations were not within reasonable bounds.

The 2009 and 2005 average prices were compared. However, it was difficult to compare as prices in the 2005 round were collected from all the regions and the average price represents those at the national level. In the Update, only prices from the capital city were collected, and their corresponding price in the 2005 round could not be accessed. Hence, comparison was very difficult and sometimes impossible. Price data for the Update were also compared with similar items in the city capital's CPI especially for food items.

All household, compensation, and construction items priced in 2005 were still available in 2009. Higher prices of food items (meat and vegetables) were observed in the fourth quarter 2009 due to the effects of two tropical storms that hit the NCR and the areas outside the NCR from which most food items are sourced.

EIID price statisticians collected prices for machinery and equipment by interviewing distributors and/or dealers. During the survey, pricing of some products in the equipment list became a problem as some items were no longer available. It was difficult to find a substitute product with specifications similar to those of the specified product. In some cases, prices varied widely for products with similar specifications but with different brands.

GDP expenditures were disaggregated using the 2006 Family Income and Expenditures Survey and by using the guidelines on GDP expenditures updating from 2005 to 2009 provided by ADB.

The PCT used in the Update was found to be user friendly, and simplified data entry and analysis. However, it was found that the data processors operated only in data entry mode since the analysis mode operates only in computers with Excel version 2007.

The Update offered insights on how other economies in the region conduct price surveys, as well as the other economies' pricing practices. The possibility of replicating PPP computation across regions of the economy is also one of the benefits of participating in the project. Using the PCT in processing CPI prices and other price indexes compiled by the NSO would also improve the monitoring system of price surveys and further enhance price data accuracy.

The NSO hopes that once the PPP figures are finalized, details of the actual computation methodology and the interpretation of results will be discussed by ADB, including the actual benefits that a participating economy can derive from using PPP-based data. NSO would find it useful to have PPP advocacy initiatives at the national level.

While ADB conducted sessions on subnational PPP computation and applications, no advocacy activities were planned by the NSO during the duration of the 2009 PPP updating project. The NSO computed a set of subnational PPPs and would like to continue undertaking this activity.

Singapore

The Department of Statistics (DOS) collected and validated data, and coordinated with various agencies for the required data for the Update. A total of eight officers from the Consumer Price Indices Section, Input-Output Tables Section, National Accounts Section, and Producer Prices Section helped compile the required data. For construction, the Building and Construction

Agency helped compile and validate the required data. The national coordinator was a statistician from the Input-Output Tables and Producer Price Division.

About 70% of the price data on the 2009 household consumption list were obtained from CPI regular price surveys. For each of these items, significant effort was exerted to compare the specifications to ensure consistency with the 2009 core product list. For items not included in the CPI regular price surveys, additional resources were deployed to collect the relevant price data.

The Update price collection covered the whole economy as Singapore is a small city state. About 287 outlets were surveyed to obtain price data for 209 household consumption items, including health and education items. These outlets included a wide range of retailers and service providers commonly patronized by households. It is also worth highlighting that the effective sample size was actually larger as some of these outlets have many branches spread all over the economy, with slight price variations between them.

The number of price quotations collected for each item varied, with more price quotations obtained for those items with volatile prices or with wide price variations among outlets. Although Singapore is a small city state with little price variations among different branches and locations, special efforts were exerted to ensure that the price quotations collected were sufficient and representative.

The product specification of each item priced was examined thoroughly to ensure that the correct products were priced. All prices obtained were checked and verified with respondents before they were submitted to ADB. Where possible, the price trends were also compared with similar items in the CPI basket to ensure data consistency. Data validation based on ADB's guidelines such as minimum and maximum price ratios, and coefficients of variation were also used to identify possible outliers. References were also made to similar price data submitted for the 2005 ICP.

The 2009 product specifications were very detailed and additional efforts were expended to check with respondents to ensure the suitability and comparability of items to be included for pricing. Consequently, participation in the Update provided Singapore with an opportunity to review and refine CPI product specifications and also to apply ADB's data validation guidelines that enhanced CPI data quality. The regional workshops also provided an invaluable platform for Singapore to know more about other participating economies through inter economy comparison of price statistics. Singapore does not foresee the need for PPP advocacy activities.

The Goods and Services Tax in Singapore was raised from 5% to 7% in July 2007 and may have contributed to the price differentials between 2005 and 2009.

Price data for machinery and equipment that matched items in the CPI under consumer durables were obtained from the CPI regular survey. For the other items, separate price collection was from retailers or distributors. For the machinery and equipment relating to producers' use, listed prices were provided instead of actual transacted prices due to price sensitivity among the few suppliers. The majority of the models of machinery and equipment required for the Update were not available or had been discontinued in Singapore. Additional effort was thus exerted to source for replacements best satisfying the required specifications.

DOS used the PCT for data on government compensation, machinery and equipment, and construction but found the experience not very efficient and user friendly due to ADB's built-in restrictions for Visual Basic Application macros.

GDP expenditures for the 155 basic headings were generally available from the national accounts.

Sri Lanka

The Prices and Wages Division of the Department of Census and Statistics was responsible for the 2009 PPP updating and appointed the director of the Prices and Wages Division as the national coordinator. The ICP unit in the Prices and Wages Division, with seven staff, assisted the national coordinator.

Open market retail prices of food and nonfood items were collected weekly, monthly, and quarterly from 12 selected price collection centers within Colombo City and suburbs for CPI compilation. Among those, three price collection centers within Colombo city limits (Grandpass, Pettah, and Wellawatta) and two others

outside the Colombo City limits (Homagama and Kaduwela) were selected for the 2009 price surveys. The price collection outlets were purposively selected within the five selected collection centers. Supermarkets, open markets, covered markets, mobile shops, street vendors, pharmacies, private doctors' clinics, private hospitals, private outlets for therapeutic appliances, and equipment were covered in the survey.

Overall, 18.7% of products were available from the CPI list. Product characteristics, specifications, and what to price in the local language were included in the price collection schedules. Price data were analyzed through the PCT and validated according to instructions in the data review workshops.

Sri Lanka has participated in the ICP since 1975. As a result of this experience, the National Accounts Division of the Department of Census and Statistics prepares GDP expenditure for ICP basic headings annually and includes these in the annual bulletin of the National Accounts of Sri Lanka.

The staff of the Price Division at the NSO, including the national coordinator, enhanced their technical capacity for the price collection, data validation, and national accounting requirements by participating in the Update.

Taipei,China

The 2009 PPP Update was implemented by the Statistical Department, Directorate-General of Budget, Accounting and Statistics, Executive Yuan, which is responsible for national statistics. A senior executive officer, who was assigned to be the national coordinator, managed the implementation of this project. Seventeen staff from the Price Division assisted in price collection and review, while three persons from the National Accounts Division were responsible for the estimation of basic heading expenditures.

To reduce costs and for more efficiency, the 2009 prices of items that exactly matched CPI products were priced from the CPI survey. The integration of a large number of Update products in the CPI is not possible as this will limit the varieties of products in the CPI list. Where the CPI product did not exactly match those descriptions in the Update, additional surveys were conducted. The overlap between the CPI and the Update items was about 12%.

To ensure data quality, the Price Division carefully compared the 2009 Update prices with the 2009 CPI items and with the 2005 ICP prices before submitting these to ADB. Some issues were communicated efficiently through email but the face-to-face discussions during the regional validation workshops greatly increased knowledge on the special cases encountered in other economies and how they were handled.

Changes in laws and regulations, and upgrades or improvements of product specifications caused some differences in product availability and specification between 2005 and 2009. For example, a new law forbids selling mercury thermometers, so these were unavailable. However, about 95% of products priced in 2005 were still available in 2009.

For machinery and equipment, many specifications in the 2005 ICP were unavailable in 2009. Thus, prices of other similar observations were collected as substitutes. As such, it may be necessary to include other brands in the product list as a means of reflecting representative domestic price levels.

The detailed and related expenditures for household consumption were obtained from the Family Income and Expenditures Survey. The commodity-flow method using data from customs and the industrial production survey were used to estimate the basic heading weights needed in gross fixed capital formation.

Through participation in the Update, communications with other economies was enhanced, which was also beneficial to the improvement of Taipei,China's price indexes. The PPP results have also been used for policy making.

Thailand

In Thailand, the Bureau of Trade and Economic Indices (BTEI), Ministry of Commerce, was responsible for implementing the Update price surveys. A group of 10 was formed under the BTEI director, with subgroups created to oversee various aspects of the 2009 price surveys, price data checking and auditing, and other

related activities. A senior economist from the BTEI was the national coordinator. Another agency involved in the Update was the National Accounts Office of the National Economic and Social Development Board, which provided GDP expenditure values by 155 basic headings.

The CPI infrastructure was not used to collect price data for the Update due to the difference in outlets. Price surveys in the capital city were conducted in nine locations for 231 products and prices were inputted online via intranet to make the process faster and more systematic.

Price movements of household items of similar products in the CPI and the 2005 ICP price surveys were compared. For wrongly priced items identified in the regional data validation workshops, price collectors accompanied by price auditors undertook additional surveys to ensure that the correct item was priced.

A few of the products in 2005 were no longer available in 2009. The increase in excise tax for alcoholic beverages and cigarettes in March 2009 may have affected price movements for this product group between 2005 and 2009.

Technological advances from 2005 to 2009, in some of the machinery and equipment items made it difficult to find exact or close matches to the 2009 list in addition to some of the specified brands not being available in Thailand. Moreover, the unit of measure of motor power is horsepower in Thailand, while the 2009 list uses kilowatts, thus making it more difficult for price statisticians to price machinery and equipment items.

The PCT was found to be user friendly, with summary statistics that facilitated identification of data errors. However, BTEI found it difficult to compare quarterly data with quarterly prices being separately recorded. Provisions for showing quarterly average prices or percentage changes would be helpful.

The benefits and experiences gained from the Update were found to be valuable. Techniques and new methodologies learned through the workshops will be applied to the CPI computation, item selection, and data validation. These techniques will also be adopted in the computation of subnational PPPs. It would be useful to conduct PPP advocacy activities covering applications of PPP concepts and methodologies and uses of PPPs for policy making.

Viet Nam

In Viet Nam, the Trade, Services, and Price Department of the General Statistics Office (GSO) implemented the Update. A working group was established headed by the national coordinator (deputy director of the Trade, Services and Price Department) and six members. The GSO only partially used the CPI infrastructure to collect prices due to the low percentage of overlap between the CPI and the 2009 household product list. Experts in medical services and products were engaged due to technical difficulties in collecting prices for health products.

Prices for 239 household products were collected. Before data were submitted to ADB, prices were reviewed using ADB guidelines. The 2009 prices were also compared with the 2005 ICP price data. Data validation was the most demanding job among the updating activities. Unlike the CPI where the use of substitute items was appropriate, the ICP required comparability across areas and/or economies.

Almost all products priced in 2005 were still available in 2009. High inflation, however, in 2007 to 2008 affected price movements in Viet Nam. While price data were obtained from CPI regular price surveys wherever possible, many of the items required for PPP computation were not included in the current CPI surveys. The PCT was found to be useful in ensuring data quality for PPP computation as it significantly minimized human errors and reduced the time required to process data.

On the estimation of GDP basic heading expenditures, the Update working group undertook additional estimation activities to disaggregate GDP expenditures into the required 155 basic headings. The 2008 Household Expenditures Survey provided useful information for this estimation.

The GSO gained substantial technical knowledge in PPP computation and plans to undertake subnational PPP computation. PPP advocacy activities would be very useful for policymakers.

Appendix 7
List of National Implementing Agencies in the 2009 Purchasing Power Parity Update

Economy	National Implementing Agency
Bangladesh	Bangladesh Bureau of Statistics
Bhutan	National Statistical Bureau
Brunei Darussalam	Department of Economic Planning and Development
Cambodia	National Institute of Statistics
China, People's Republic of	National Bureau of Statistics of China
Fiji	Fiji Bureau of Statistics
Hong Kong, China	Census and Statistics Department
India	Ministry of Statistics and Programme Implementation
Indonesia	Badan Pusat Statistik
Lao People's Democratic Republic	Lao Statistics Bureau
Malaysia	Department of Statistics
Maldives	Department of National Planning
Mongolia	National Statistical Office
Nepal	Central Bureau of Statistics
Pakistan	Pakistan Bureau of Statistics
Philippines	National Statistics Office
Singapore	Department of Statistics
Sri Lanka	Department of Census and Statistics
Taipei,China	Directorate-General of Budget, Accounting and Statistics
Thailand	Bureau of Trade and Economic Indices
Viet Nam	General Statistics Office

Glossary

Term	Definition
Acquisitions	Goods (including assets) and services acquired by institutional units when they become the new owners of the goods or when the delivery of services to them is completed.
Actual final consumption (AFC)	Value of the consumption goods and services acquired by households, whether by purchase in general, or by transfer from government units or non-profit institutions serving households (NPISHs), and used by them for the satisfaction of their needs and wants; it is derived from their final consumption expenditure by adding the value of social transfers in kind received.
Additivity	A concept that the real expenditures for higher-level aggregates can be obtained simply by adding the real expenditures of the subaggregates of which they are composed. Real expenditures obtained using EKS-based purchasing power parities (PPPs) are not additive, so the sum of the real expenditures for the components of gross domestic product (GDP) does not equal the real expenditure on GDP.
Basic heading	In principle, a group of similar well-defined goods or services for which a sample of products can be selected that are both representative of their type and of the purchases made in countries. In practice, a basic heading is defined as the smallest aggregate for which expenditure data are available.
Benchmark	A standard, or point of reference, against which an estimate can be compared, assessed, measured or judged. PPPs are computed using price data from a full list of household and non-household products and weights derived from the expenditures on gross domestic product for a specified reference year. In the International Comparison Program (ICP), this reference year is often referred to as the "benchmark year" or simply as the "benchmark".
Binary comparison	A price or volume comparison between two countries that draws on data only for those two countries. Also referred to as a "bilateral comparison".
Changes in inventories	Consist of changes in (i) stocks of outputs that are still held by the units that produced them prior to their being further processed, sold, delivered to other units, or used in other ways; and (ii) stocks of products acquired from other units that are intended to be used for intermediate consumption or for resale without further processing. They are measured by the value of the entries into inventories less the value of withdrawals and the value of any recurrent losses of goods held in inventories.
Classification of Individual Consumption by Purpose (COICOP)	A classification used to identify the objectives of both individual consumption expenditure and actual individual consumption.
Classification of the Functions of Government (COFOG)	A classification used to identify the socioeconomic objectives of current transactions, capital outlays, and acquisition of financial assets by general government and its subsectors.
Collective consumption service	A service provided by general government simultaneously to all members of the community or to all members of a particular section of the community, such as all households living in a particular region. It is the same as collective consumption expenditure by general government.
Combinatorial approach	A process of selecting a subset of products from a larger list of products where all possible permutations are computed and a random selection of products are generated with a pre-defined set of parameter(s). For the Update a 30% target was set for the subset product list for each basic heading

continued on next page

Glossary Table. continuation

Term	Definition
Comparability	A requirement for countries to price products that are identical or, if not identical, equivalent. Pricing comparable products ensures that differences in prices between countries for a product reflect actual price differences and are not influenced by differences in quality. Two, or more, products are said to be comparable either if their physical and economic characteristics are identical, or if they are sufficiently similar that consumers are indifferent between them.
Comparative price levels (CPLs)	See "Price level index."
Consumer durables	Durable goods acquired by households for final consumption (i.e., those that are not used by households as stores of value or by unincorporated enterprises owned by households for purposes of production); they may be used for purposes of consumption repeatedly or continuously over a period of 1 year or more.
Core product list	A reduced list of products selected from the 2005 ICP list to be priced in the PPP updating. In the Update, it best reflects the outcomes that would have been achieved by using the full product list from the 2005 ICP round.
Core to full list adjustment factors	Coefficients, based on relationships observed in the 2005 ICP, used to adjust the 2009 PPPs at the basic heading level computed using the core product list to make them consistent with the full list PPPs for each basic heading.
Capital to national price adjustments	Adjustment factors used in scaling capital city prices to national average prices using information from the price data collected for the 2005 ICP.
Country-product-dummy (CPD) method	The CPD method is a generalized multilateral method that uses regression techniques to obtain transitive PPPs for each basic heading. It assumes that the patterns of relative prices of the different products within a basic heading are all constant between any given pair of countries; and that each country has its own overall price level for the basic heading and that it fixes the level of absolute prices in the basic heading for that country. The data for a given category consist of all the prices available for the various specifications for the entire collection of countries in the region.
Country-product-representativity-dummy (CPRD) method	The CPRD method is an extension of the CPD method. Unlike the CPD method, which assumes that all products priced are equally representative in each country, the CPRD method explicitly takes into account whether each product is representative or nonrepresentative in each country in which it is priced.
Durable good	A good that may be used repeatedly or continuously over a period of more than a year, assuming a normal or average rate of physical usage. A consumer durable is a good that may be used for purposes of consumption repeatedly or continuously over a period of a year or more.
Eltetö-Köves-Szulc (EKS) method	A procedure that enables binary PPPs, which are non-transitive when more than two countries are involved in the comparison, to be transformed into transitive PPPs, so that comparisons made between any pair of countries are mutually consistent. The EKS method produces transitive PPPs that are as close as possible to the non-transitive PPPs originally calculated in the binary comparisons. In practice, the EKS method is relevant only to the second part of this process (i.e., making the PPPs transitive). Real expenditures calculated using EKS-based PPPs are not additive (e.g., the sum of the major components of GDP does not equal the real expenditure on GDP).
Expenditure relatives	Real measures expressed in index form with the level of an individual country or an average for a group (such as Asia and the Pacific region) set to a value of 100.
Final consumption	Goods and services used up by individual households or the community to satisfy their individual or collective needs or wants.
Final expenditure	The sum of final consumption expenditures of households; of NPISHs and general government; and of expenditures on gross fixed capital formation.
Full product list	In the context of the Update, the full product list is the complete list of products (household and non-household) priced by participating economies in the 2005 ICP.

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Glossary Table. continuation

Term	Definition
Geary-Khamis (GK) method	A method of computing PPPs that are transitive and real expenditures that are additive (e.g., the sum of the major components of GDP equals the real expenditure on GDP). Involves valuing a matrix of quantities by applying a vector of international prices. The vector is obtained by averaging national prices across participating economies after they have been converted to a common currency with PPPs and weighted by quantities.
General government	The sector consisting of the totality of institutional units which, in addition to fulfilling their political responsibilities and their role of economic regulation, produce principally nonmarket services (possibly goods) for individual or collective consumption and redistribute income and wealth.
Government final consumption expenditure (GFCE)	Or final consumption expenditure of government consists of expenditure, including imputed expenditure, incurred by general government on both individual consumption goods and services and on collective consumption services.
Gross capital formation (GCF)	Measures the total value of gross fixed capital formation, changes in inventories, and acquisitions less disposals of valuables for a unit or sector.
Gross domestic product—expenditure based	Total final expenditures at purchasers' prices (including the free-on-board value of exports of goods and services), less the free-on-board value of imports of goods and services.
Gross fixed capital formation (GFCF)	Measures the total value of a producer's acquisitions, less disposals, of fixed assets during the accounting period. It includes certain additions to the value of nonproduced assets (such as subsoil assets or major improvements in the quantity, quality or productivity of land) realized by the productive activity of institutional units.
Household final consumption expenditure (HFCE)	Or final consumption expenditure of households consists of the expenditure, including imputed expenditure, incurred by resident households on individual consumption goods and services, including those sold at prices that are not economically significant.
Household products	In the Update, these refer to the consumption of households for the following components: • Food and nonalcoholic beverages • Alcoholic beverages, tobacco and narcotics • Clothing and footwear • Housing, water, electricity, gas, and other fuels • Furnishings, household equipment, and routine maintenance of the house • Health • Transport • Communication • Recreation and culture • Education • Restaurant and hotels • Miscellaneous goods and services (personal grooming, personal care, personal effects, financial services, and other services).
Intra-country data validation	Process in which the individual price observations are edited and checked for within country variations. It is also the level at which first checks are carried out on the average prices of a country
Inter-country data validation	Process in which the average prices for the same products in different economies are checked against each other.
Local currency unit	Or national currency unit is the monetary unit in which economic values are expressed in a country.
Multilateral comparison	A simultaneous price or volume comparison of more than two countries that produces consistent relations among all pairs of countries—that is, one that satisfies the transitivity requirement.
National annual average price	A price that has been averaged both over all localities of a country to account for regional variations in prices and over the days, weeks, months or quarters of the reference year so as to allow for seasonal variations in prices as well as general inflation and changes in price structures.

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Glossary Table. continuation

Term	Definition
Nondurable good	A good that may be used only once because the initial use results in it being completely used up or consumed. Food products are examples of consumer nondurables.
Non-household products	In the Update, these refer to the following product groups • Compensation of employees by government (health, education, and collective services) • Construction • Machinery and equipment
Non-profit institutions serving households (NPISHs)	Consist of non-profit institutions that are not predominantly financed and controlled by government and that provide goods or services to households free or at prices that are not economically significant.
Nonresident	A unit is nonresident if its center of economic interest is not in the economic territory of the country concerned.
Numeraire currency	A currency unit selected to be the common currency in which PPPs and final expenditures on GDP (nominal and volumes) are expressed. The numeraire is usually an actual currency (such as the Hong Kong dollar) but it can be an artificial currency unit developed for PPP comparisons.
Per capita volumes (or per capita real expenditures)	Standardized measures of real expenditure (or volume). They indicate the relative levels of the product groups or aggregates being compared after adjusting for differences in the size of populations between countries. At the level of GDP they are often used to compare the economic well-being of populations. They may be presented either in terms of a particular currency or as an index number.
Price level index (PLI)	The ratio of a PPP to the corresponding exchange rate. It shows how the price levels of countries compare with each other. It is expressed as an index on a base of 100. A PLI greater than 100 means that, when the national average prices are converted at exchange rates, the resulting prices tend to be higher on average than prices in the base country. At the level of GDP, PLIs provide a measure of the differences in the general price levels of countries. PLIs are also referred to as "comparative price levels".
Price relative	The ratio of the price of an individual product in one period to the price of that same product in some other period. In the ICP context, a price relative refers to the price of a product in one country to that of the same product in another country in the same period.
Product specifications	Precise characteristics that are specified for the individual products for which prices are to be collected.
Purchasing power parity (PPP)	A PPP is a price relative that measures the number of units of country B's currency that are needed in country B to purchase the same quantity and quality of an individual good or service, which one unit of country A's currency can purchase in country A.
Real expenditure (or volume)	Measures obtained by using PPPs to convert final expenditures on product groups, major aggregates, and GDP of different countries into a common currency, by valuing them at a uniform price level. Expenditures so converted reflect only volume differences between countries. They are the spatial equivalent of a time series of GDP for a single country expressed at constant prices. They provide a measure of the relative magnitudes of the product groups or aggregates being compared. At the level of GDP, they are used to compare the economic size of countries. They may be presented either in terms of a particular currency or as an index number.
Reference PPPs	Used for basic headings for which no prices are collected; they are based on prices collected for other basic headings.
Relative price levels	The ratios of PPPs for components of GDP to the overall PPP for GDP for a country. They indicate whether the price level for a given basic heading or aggregate is higher or lower relative to the general price level in the country.
Representative product	An item that accounts for a significant share of the expenditures within a basic heading in a country.

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Glossary Table. continuation

Term	Definition
Representativity	A concept that relates to individual products within the same basic heading and to the product list for a basic heading. Representativity of a product within a basic heading is defined in terms of a specific country. A product is either representative or unrepresentative of the price level in country A for a given basic heading, irrespective of the relative importance of the basic heading with respect to other basic headings. It is representative if, in country A, the price level of the product is close to the average for all products within the basic heading. Usually, though not necessarily, the purchases of the product will account for a significant proportion of the total purchases of all products covered by the basic heading. If not, the product will be sold in at least sufficient quantities for its price level to be typical for the basic heading.
Resident	An institutional unit is resident in a country when it has a center of economic interest in the economic territory.
Semi-durable good	A good that can be used multiple times over a period of more than a year. But it has an expected lifetime of use significantly shorter than that of a durable good and its purchaser's price is substantially less than that for a durable good.
Services	Outputs produced to order, which cannot be traded separately from their production; ownership rights cannot be established over services and by the time their production is completed they must have been provided to the consumers.
Structured Product Descriptions (SPDs)	Generic descriptions that list the characteristics relevant to a particular narrow cluster of products.
Transitivity	The property whereby the direct PPP between any two countries (or regions) yields the same result as an indirect comparison via a third country (or region). It is sometimes referred to as "circularity".
Volume	See "Real expenditure".

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6 ADB Avenue, Mandaluyong City
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Printed on recycled paper

ISBN 978-92-9092-860-7

Printed in the Philippines