

The International  
Comparison Program



# COMPARISON OF ECONOMIC OUTPUTS AND PURCHASING POWER OF CURRENCIES

**Western Asia**



United Nations  
Economic and  
Social Commission  
for Western Asia





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AFESD	Arab Fund for Economic and Social Development
AFHC	actual final household consumption
BH	basic heading
BOCC	basket of construction components
CAS	(Lebanese) Central Administration for Statistics
CIS	Commonwealth of Independent States
COFOG	Classification of the Functions of Government
COICOP	Classification of the Individual Consumption According to Purpose
CPD	country product dummy
CPI	consumer price index
DCF	data collection form
DPM	data processing module
ECP	European Comparison Program
EKS	Èltetö, Köves, and Szulc
UN-ESCWA	Economic and Social Commission for Western Asia
EU	European Union
FISIM	financial intermediation services indirectly measured
FOB	free on board
GCC	Gulf Cooperation Council
GDP	gross domestic product
GFCF	gross fixed capital formation
GK	Geary-Khamis (index/method)
GNI	gross national income
ICP	International Comparison Program
IMF	International Monetary Fund
IsDB	Islamic Development Bank
LCU	local currency unit
Ln	natural logarithm
NGO	non-governmental organization
NPISH	non-profit institution serving households
OECD	Organization for Economic Co-operation and Development
PCM	price collection module
PLI	price level index
PPP	purchasing power parity
PS	product specifications
SGER	secondary (school) gross enrollment rate
SNA	System of National Accounts
SPD	Structured Product Description
TAG	Technical Advisory Group
UNDP	United Nations Development Programme
UNSD	United Nations Statistics Division
USAID	United States Agency for International Development
VAT	value added tax
WAC	Western Asia currency
WDI	World Development Indicator
WDM	weights diagnostic module
WHO	World Health Organization

The International Comparison Program (ICP) is a global statistical initiative aimed at estimating purchasing power parities (PPPs) that are used to convert gross domestic product (GDP) and its components from national currency denominations into common international currency units at equal price level. Prior to the ICP, official exchange rates were generally used to convert GDP to a common currency, but exchange rates do not reflect international price level differences and are subject to short-term fluctuations. However for some purposes, such as comparing international debt positions and foreign trade, the use of exchange rate will be more appropriate. For comparisons of real domestic volumes of product and relative price levels, the purchasing power of currencies must be taken into account. PPP-based economic data inform users about the relative sizes of markets, the size and relative shares of key components of GDP, and the purchasing power of currencies.

The regional comparison in Western Asia was carried out within the general framework of the ICP 2005 project and represents an effective partnership that has brought together national statistical offices from 11 countries, as well as regional agencies and international organizations. This report marks the culmination of the joint and concerted efforts that have brought the latest round of the ICP in Western Asia to a successful completion. The program's successful completion would not have been possible without the joint partnership and the financial support of the governments of the participating countries, the Arab Fund for Economic and Social Development (AFESD), the Islamic Development Bank (IsDB) and the ICP Global Trust Fund.

This report presents the results of the 2005 round of the ICP in Western Asia region, including total and per capita 'real' GDP and its key components, such as household consumption, collective gov-

ernment spending, gross fixed capital formation, net foreign balance and a number of other aggregates.

The results contained in the report offer a wealth of information, opening up new research opportunities and yielding insights and substantial dividends for policy and business decision-making. Comparisons on key development indicators will become more significant with the availability of more robust PPPs at various levels of disaggregation. More importantly, the use of PPP data in poverty analysis, particularly for estimating poverty incidence based on internationally comparable poverty lines, will be pivotal in estimating and assessing poverty in the region.

Apart from generating PPP-related economic data, the ICP serves as a catalyst in statistical capacity-building. It also encourages regional and global data harmonization by demonstrating rigorous compliance with international standards for statistical classifications, data collection, processing and reporting. As a result, each of the 11 member countries has shown great interest, investing heavily in the program.

UN-ESCWA, in its effort to build a sound and sustainable knowledge base, is unequivocally committed to working with partners and building on the current momentum. It is my sincere hope that the current report will prove to be another stepping stone on the path to building a stronger and better knowledge base in the future. It is, therefore, essential to build on and strengthen the current partnership while nurturing new partnership to expand the Program's support base.

Bader Omar Al Dafa  
Under-Secretary-General  
Executive Secretary

The ICP-Western Asia regional program was coordinated by UN-ESCWA under the general management of Mr. Tarik Alami and a team consisting of Mr. Majed Skaini and Ms. Shadan Jamal. The contribution of Mr. Mohamad Al-Badrawy, who led the ICP-Western Asia regional office from 2003 to 2005, is gratefully acknowledged. Other contributors who were part of the team but have since moved to other areas of challenges include: Ms. Neda Jafar, Ms. Ghada Fayad, and Ms. Farah Nsouly.

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Jordan and Oman deserve special mention for carrying an extra burden representing the Western Asia region and participating in the “ring” comparison that involved 18 countries from five regions. Egypt has also participated as an African member and ring country in addition to its participation under Western Asia program.

The guidance and leadership of the ICP-Western Asia Executive Board is also acknowledged with deep gratitude. The Board is chaired by Ms. Nouria Al-Sagr from Kuwait, and currently consists of Dr. Maral Tutelian (Lebanon), Mr. Sabir Al-Harbi (Oman), Ms. Olfat El-Basy (Egypt), and Mr. Samy Eskander Abdalla from AFESD. The contribution of Mr. Abdul-Rahman Al-Mansoury, who chaired the Board until the beginning of 2007, is also acknowledged. The Board provided overall strategic direction, overseeing the program’s budget and implementation plan.

Last, but not least, Ms. Shadan Jamal deserves a special recognition for her exceptional assistance in organizing seminars and supporting the ICP team in UN-ESCWA.

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# Introduction

**R**apid globalization has underscored the urgent need for relevant, reliable and timely statistics. That, in turn, has brought to sharp focus the long-standing international data comparability and harmonization issues. From a national policy-making perspective, an increasingly integrated world requires national governments to have a clear picture of their economic structure as well as their current positions and future prospects in regional and global markets. When seen in a regional or global perspective, a country's data reveal valuable and policy-relevant insights in respect of its price relatives, economic structure and real volume of outputs.

The International Comparison Program (ICP) represents a global effort to establish a method for comparing per capita and total gross domestic product (GDP) or its sub-aggregates in real terms across countries to help understand, among other things, inter-country differences in standards of living, levels of investment, size of government outlays and the purchasing power of currencies. The program develops an alternative rate of exchange called purchasing power parity (PPP) that corrects the dif-

ferences in price levels and thus enables comparison of economic aggregates and size of markets based on real volumes of output.

The PPP for, say, the Saudi Arabian rial against the United States dollar (US dollar), is defined by the number of rials needed to buy in Saudi Arabia the same amount of goods and services as one US dollar would buy in the United States of America. PPPs can be viewed as an inter-spatial analogy to constant price time series in national accounts, which present quantities of different years valued at base year prices. Just as constant price time series equalize prices across time and allow users to look at temporal changes in real GDP, PPPs establish price parity across space and permit comparison of economic volumes free of price and exchange rate distortions.

The United Nations System of National Accounts 1993 (1993 SNA) provides international standards for the compilation and reporting of GDP and its components. The challenge in international economic comparisons lies in converting national currency-denominated values into a common international currency unit. For example, a comparison between the economic well-being of an

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average Saudi Arabian citizen and that of an average Omani, Malaysian or Briton can be measured by comparing their per capita actual final household consumption (AFHC), after their national currency-denominated per capita estimates are converted into a common international unit of currency at the same price level. Similarly, for example, the average of investment in capital goods in The Syrian Arab Republic can be meaningfully compared with the average investment in capital goods by its neighbors or with that average at the global level. It can be done only after all the relevant expenditure estimates are converted into an international currency and inter-country price differences have been adjusted for.

The national accounts identity, which provides the basis for compiling economic data, is commonly represented by a simple equation,  $E = Q \cdot P$ , i.e., expenditure (E) on GDP or its components equals volume of final output or quantity (Q) multiplied by the corresponding price (P). Since price levels vary between countries, the most important challenge in cross-country comparison is to determine how much of the difference in each country's reported national accounts expenditure estimates is accounted for by price levels and how much is due to the difference in the volume of goods and services (quantity) embodied in their GDP estimates. In order to compare real volumes of output across countries, it is necessary to account for price level differences between them. Put differently, it is necessary to establish equivalence in the price levels and thus in the purchasing power of currencies to meaningfully compare levels of expenditure values across countries.

Exchange rate ratios as conventional factors of national currency-denominated expenditure values are fraught with shortcomings. First, they do not account for differences in price levels and are often quite far apart from the actual purchasing power of the respective currencies' unit ratios. Second, they

are subject to short-term fluctuations, which are driven by factors that have very little or nothing to do with the level or movements of prices underlying the volumes of goods and services produced and consumed in each country. Thus, exchange rates are not useful for economic policy decisions, which should be based on volumes of outputs free of price and exchange rate distortions.

Tourists encounter that phenomenon on a daily basis. A Jordanian would need to carry more money for a trip to Kuwait than for a similar trip to Egypt, because at market exchange rates, prices are generally higher in Kuwait than in Egypt. The problem is encountered on a broader scale by international organizations, which must estimate relative levels of economic outputs of member countries in real terms in order to provide them with policy advice on growth and poverty alleviation and to channel aid to the most deserving countries. Similarly, multilateral corporations are increasingly finding ICP data critical in determining the relative size of markets and comparing the cost of doing business in different countries.

A quick look at the 2005 ICP global report makes that point clear. For example, the ICP preliminary global report published in December 2007 indicates that the 11 Western Asian countries that took part in the 2005 round represent 2.9 per cent of the world population and 2.5 per cent of the world GDP when PPP conversion factors are used. In contrast, if exchange rate-based estimates are used, the region accounts for only 1.6 per cent of the world GDP. In terms of real per capita GDP, the report places Qatar and Kuwait second and fifth in the world, respectively. When per capita GDP figures are converted by exchange rate, Qatar becomes fifth and Kuwait's ranking drops to 20th out of 146 countries that had taken part in the 2005 round. The two economies with the lowest per capita GDP in the region, Iraq and Yemen, rank 97th and 103rd, respectively

Since price levels vary between countries, the most important challenge in cross-country comparison is to determine how much of the difference in each country's reported national accounts expenditure estimates is accounted for by price levels and how much is due to the difference in the volume of goods and services (quantity) embodied in their GDP estimates. It is necessary to account for price level differences between them.

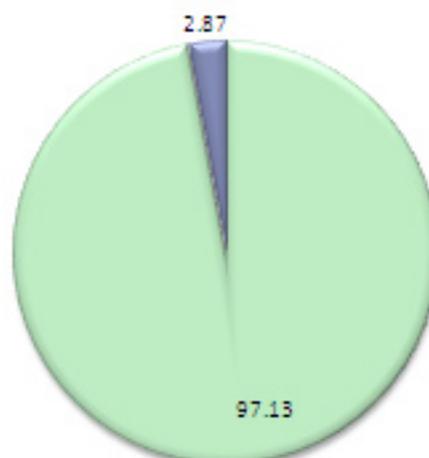
in PPP terms.

Over four decades of its existence, the ICP has expanded its country coverage and refined its institutional, organizational, operational and methodological principles and practices in order to improve the quality of PPP data. In the 2005 round of surveys, ICP covered 146 countries in six regions - including 11 in Western Asia - making it the largest international statistical endeavor ever undertaken. The first international comparison in 1970 involved only ten countries, in which none from Western Asia participated.

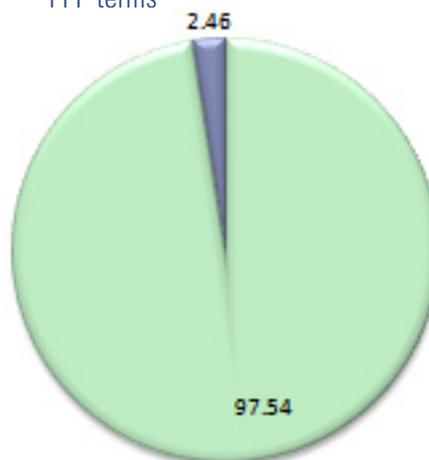
This report presents the results of the 2005 Western Asia regional comparison, which was conducted under the general framework of the ICP. Eleven countries participated in ICP-Western Asia: Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, the Syrian Arab Republic and Yemen.

The report is divided into six chapters. Chapter 1 constitutes the main report. It begins with a bird's eye view of the rationale for such a massive undertaking, presents the program's conceptual underpinnings and highlights the uses and limitations of the data. Chapter 2 presents the results of the 2005 Western Asia regional comparison, including highlights of the main findings and analysis of the data in brief. Chapter 3 focuses on technical issues, including the program's methodological framework and procedural practices. It provides a brief description of how PPP estimates are calculated. Chapter 4 presents related explanations of special treatments for difficult-to-compare components of GDP. Chapter 5 outlines the benefits of participating in the ICP. Chapter 6 provides a brief overview of the ICP past and present. Tables containing detailed results of the comparison are annexed at the end of the document. The annex section also includes detailed description of the method used in calculating PPP estimates and technicalities used in other areas.

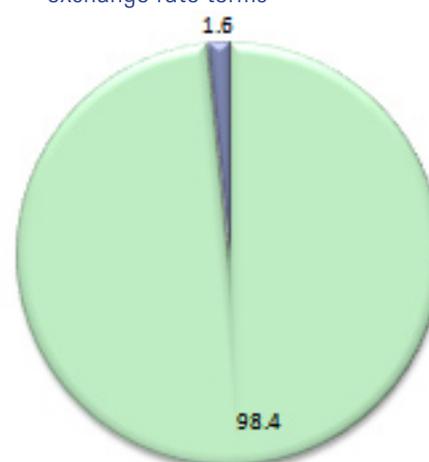
Western Asia's Population as a percentage of World Population



Western Asia GDP share as a percentage of the World GDP in PPP terms



Western Asia GDP share as a percentage of the World GDP in exchange rate terms



Western Asia Region      Rest of the World

In terms of per capita GDP, Qatar and Kuwait rank second and fifth in the world, respectively. When per capita GDP figures are converted by exchange rate, Qatar remains in the top five, but Kuwait's ranking drops to 20th out of 146 countries. The two economies with the lowest per capita GDP in the region, Iraq and Yemen, rank 98th and 105th, respectively in the world in PPP terms.



# 1

## A BIRD'S EYE VIEW OF ICP AND PPP ESTIMATES

### 1.1 WHY PPPs AND NOT EXCHANGE RATES

*Exchange rate conversions underestimate the total expenditure on GDP of developing countries -* Because exchange rates do not take into account the relatively low price levels in developing countries, they underestimate the GDP of developing countries. When compared with exchange rate-based estimates, PPP measures that are based on standardized price levels, result in higher GDP estimates for countries with relatively low price levels. Figures 1 and 2 show that the relative economic sizes of countries such as China and India increase significantly when PPPs rather than exchange rates are applied. Figure 1, which is exchange rate-based shows China as the fifth largest economy in the world, behind the United States, Japan, Germany and the United Kingdom of Great Britain and Northern Ireland. When PPP conversion factors are used, as in figure 2, China becomes the second largest economy surpassing Japan, Germany and the United Kingdom. Canada and Spain drop out of the top 10 when estimates are PPP-based. India, which is not in the top 10 in exchange rate terms, becomes the fifth largest economy when PPP estimates are used.

*Market exchange rates exaggerate the gap between developed and developing countries' per capita incomes -* For example, exchange rate-based estimates suggest that in 1980 the average American was about 46 times richer than the average Indian; on a PPP basis, the average American is 19 times richer.

Figure 1. GDP in exchange rates (billions of US dollars)

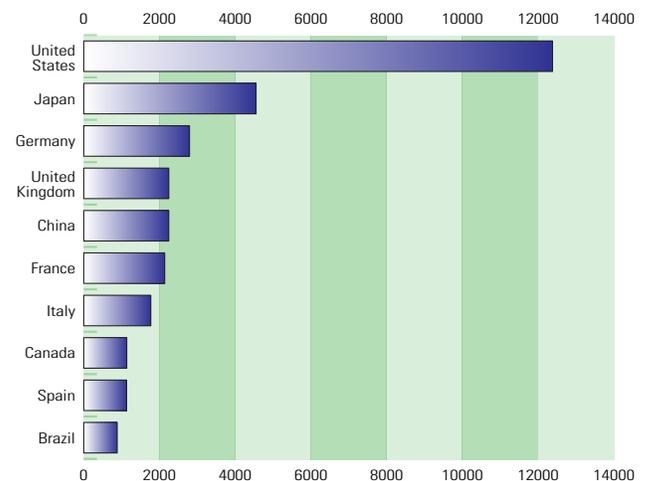


Figure 2. GDP in PPP (billions of US dollars)

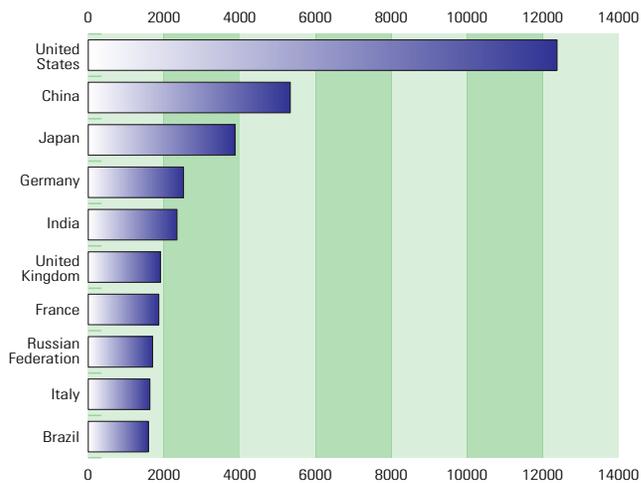


Figure 3. Japan per capita GDP (US=100)

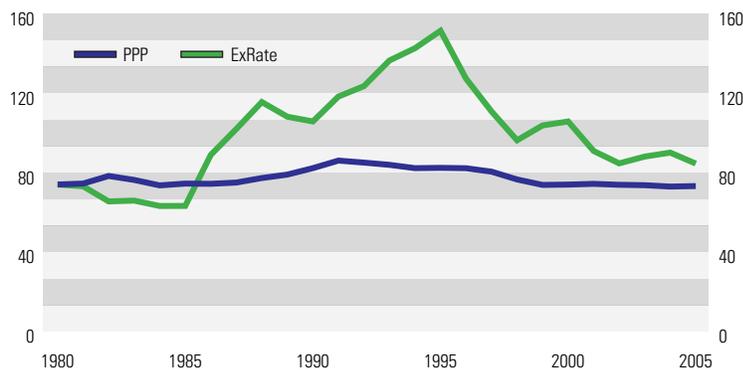
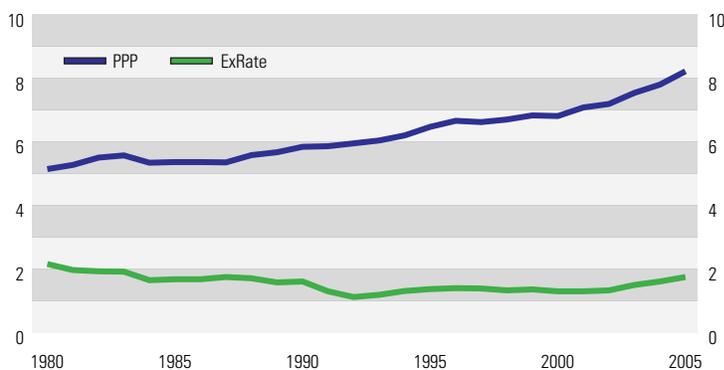


Figure 4. India per capita GDP (US=100)



Looking at 2005, PPP figures indicate that India has narrowed the gap significantly, with the American citizen being less than 12 times richer than the Indian. In contrast, the exchange rate-based figure for 2005 shows that the American is 57 times richer, despite the fact that India recorded a significantly higher rate of economic growth than the United States over the last two decades.

*Exchange rates are subject to frequent and erratic fluctuations* - Another problem is the observed frequent fluctuations in exchange rates that are driven by factors other than changes in relative prices, such as government interventions and currency speculations. For example, in the aftermath of the 1997 East Asia economic crisis, exchange rate-based GDP estimates of the affected countries were greatly distorted by the sharp depreciations of their currencies. Between 1997 and 1998, Indonesia's exchange rate-based GDP per capita "declined" by 67 per cent from \$1,607 in 1997 to \$529 in 1998, although, in reality, the volume of goods and services produced and consumed in Indonesia had scarcely changed. Similarly, Russia's exchange rate-based GDP per capita declined from \$2749 in 1997 to \$1844 in 1998.

Because exchange rates do not reflect relative price levels or move in tandem with them over time, their estimates (even when three-year average is used to smooth observed annual fluctuation) may indicate relative levels of income and shifts in relative positions over time. Those levels are inconsistent with actual levels and movements of what constitutes real income: actual volumes of goods and services embodied in GDP. For instance, in 1985, according to the Atlas exchange rate-based estimates, Japan's per capita income was 64 per cent of that of the United States, but by 1995 it had shot up to 152 per cent (see figure 3). That was not because of a significantly superior performance of the Japanese economy but of a nearly 240

per cent appreciation of the Japanese yen. Between 1995 and 2004, Japan lost ground; its per capita GDP dropped to 80 per cent of that of the United States. That was triggered by depreciation of the Japanese Yen.

Comparison of the United States and India over the same period – 1985 to 2005 – reveals a similar paradox (see figure 4). India's per capita income was less than 2 per cent of the United States per capita income in 1985 and still remains the same in 2005 despite the fact that, over the same period, per capita real income in India grew significantly faster than in the United States.

Structural economic analysis can be done on the basis of indicators in national currencies or equivalently in exchange rate-based estimates because relative indicators (shares, percentages) are formally comparable. However, in many cases it is desirable to use the structural analysis based on PPP estimates because price levels are not the same over different kinds of goods. In the case of developing countries, for example, capital goods tend to be relatively more expensive than consumer goods. Such behavioral features of growth can hardly be expected to be revealed by exchange rates, which implicitly assume a uniform relation of PPP to exchange rates for all kinds of goods and services.

## 1.2 CONCEPTUAL UNDERPINNINGS OF ICP

At its most basic level – that of individual products – the ICP uses principles and techniques similar to *The Economist's* Big Mac index. The Magazine has been publishing the index for over 20 years. McDonald sells Big Mac hamburger in 120 nations, which provides a crude way to compare price levels across countries, holding quantity, quality, service delivery and outlet type constant. The practice, known as *Burgernomics* is based on the theory of PPP.

Assume a world consisting of two countries (A and B) and only one prod-

uct (Big Mac). Assume also per capita GDP as measured by per capita Big Mac consumption in monetary terms in country A is 120 per cent of that of country B, but the price of Big Mac in country A is 20 per cent higher than that in country B. In monetary terms, before accounting for price level differences, an average citizen living in country A would appear better off compared to an average citizen in country B. However, in terms of real volume of Big Mac consumed, the economic welfare of citizens in the two countries will be similar. That is because although the average citizen in country A seems to consume 20 per cent more Big Mac in nominal (monetary) terms, he/she faces 20 per cent higher prices at the counter that offsets the 20 per cent premium in his/her nominal Big Mac consumption. It is only when price levels are equalized (or parity is established between their currencies) that comparison of real per capita Big Mac consumption between the two countries can be done. That is the essence of the PPP concept underlying *The Economist's* Big Mac index, which represents the microcosm of the basic principles of ICP.

Unlike the Big Mac index, the ICP-generated PPP rates are based on price comparisons for 155 basic expenditure categories covering a comprehensive nationwide sample of goods and services. In that, all expenditure components of GDP, including household consumption, purchases of capital goods and outlays by government are represented. Prices are usually collected for several specifications of goods and/or services in each of the 155 categories. The number of products priced for that purpose may vary from 1000 to 5000, depending on the regional comparison. The calculation of purchasing power equivalents for various countries is carried out by collecting prices of comparable and representative items in different countries and aggregating price ratios of those items by their respective GDP ex-

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penditure weights.

### 1.3 USES OF PPP DATA

Data generated by ICP and their extensions over time and space have increasingly become a crucial tool of economic research and policy advice to national governments, as well as international organizations. The ICP provides the basis for the core research and policy areas of the development community, as the PPP concept offers a premier source of information to classify countries by level of economic development. Moreover, PPP data crucially underpin the Millennium Development Goals and all attempts to measure progress toward a world free of poverty.

To name just a few applications by international and regional agencies, PPP data are fundamental to the widely-used “dollar a day” international poverty threshold. They are also used to: construct both the Human Development Index and Gender Empowerment Measure (UNDP); measure the relative sizes of economies and compute weighted averages of regional growth rates (IMF); compare health expenditure per capita and undertake health inequality assessments (WHO); and design effective aid programs (European Union (EU), USAID). In addition, multinational companies are increasingly using PPP data to determine market size, evaluate foreign investment costs and assess project viability. With rapid globalization and the increasing integration of international markets, the demand for PPP data in that area is expected to increase. At the same time, their use in development research has also grown significantly in recent years. For example, those data are commonly used in development and international trade research to explain long-run convergence, comparative growth rates, international competitiveness and patterns of specialization among industries.

Furthermore, exchange rate-based

comparisons not only obscure the true quantity relationships among countries for GDP as a whole, they also distort structural relationships in real terms among its major components (e.g., private final consumption and gross fixed capital formation (GFCF)). Such distortions arise because the deviation of purchasing powers of currencies from official exchange rates is not the same for different kinds of goods. In the case of developing countries, for example, capital goods tend to be relatively more expensive than consumer goods, while in developed countries services are observed to be more expensive relative to goods. Exchange rate-based estimates that implicitly assume a uniform relation between exchange rates and purchasing power of currencies for all goods and services yield distorted results.

Various aggregates of GDP provided by ICP can also be used for comparing macroeconomic variables, such as expenditure shares on food, health care and transportation between regions. Often when price differences across regions are taken into consideration, the comparisons produce surprising results. The ICP data are particularly useful for assessing the comparative advantage of a country. For example, a number of countries have used the data for assessing competitiveness in world trade of selected manufactures and for evaluating taxes and subsidies. Knowledge about price structure and where price increases or decreases are occurring and how they are interrelated with price movements in other sectors of the economy is critical to an understanding of the effect of structural adjustment policies.

PPP-based estimates can also be used in many different situations. For example, assume an expatriate worker earning 3,360 Bahraini dinars (BD) in Bahrain gets an offer to relocate to Qatar with a salary of 38,500 Qatari riyals. Using exchange rate conversion, the worker’s salary in Bahrain is less than

PPP-based estimates can be used in different situations. For example, assume an expatriate worker earning 3,360 Bahraini dinars in Bahrain gets an offer to relocate to Qatar with a salary of 38,500 Qatari riyals. Using exchange rate conversion, the worker’s salary in Bahrain is less than \$9,000. The offer in Qatar, on the other hand, exceeds \$10,500. Using PPP conversion rates, the salary offered in Qatar would be equivalent to BD 3,342, which is essentially the same as what the worker is making in Bahrain.

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#### 1.4 LIMITATION OF PPP DATA

The limitation of the ICP data should be seen from two perspectives. The first involves recognizing that there are areas where PPP data should not be used. The second relates to understanding the weak areas of the data in terms of data quality, country coverage and timeliness and taking appropriate precaution when using the data.

##### Areas where PPP data should not be used

A first caution concerns the theoretical concept of “equilibrium exchange rates”. They are defined as rates of exchange that would balance each country’s imports and exports of goods and services – either in each and every year or taking an average of three or four years together. Equilibrium exchange rates have been interpreted by some as the “correct” or “natural” exchange rates, which would prevail in the absence of government intervention and toward which actual exchange rates tend to converge. The notion that equilibrium exchange rates could be approximated by PPPs originated with the Swedish economist Gustav Cassel. However, the PPPs generated by the ICP do not only measure the relative prices of tradable goods, they also reflect the prices of buildings and civil engineering works as well as the costs of producing government services. None of those prices enter into international trade and so does not directly affect exchange rates. More generally, exchange rates are determined by the supply of, and the demand for, different currencies and both may be heavily influenced by speculative capital flows motivated by expectations about rates of inflation and interest rates. In short, PPPs cannot be used

to determine what the exchange rate should be.

A second point to note is that PPPs reflect what money can buy in the domestic market of each country. As a result, they are not appropriate for converting international trade in goods and services into a common currency. International trade statistics published by the United Nations and other international organizations are therefore converted into a common currency (usually the US dollar) using exchange rates. That is the correct procedure since exports and imports are transacted at exchange rates, and not at PPP rates.

The same consideration applies to data on international capital flows and international debt. Comparative statistics on official development aid, foreign direct investment and other capital movements between countries should be converted into a common currency using exchange rates. Foreign debt is often measured as a percentage of GDP with both aggregates valued in domestic currencies, but if the absolute levels of debt are being compared between countries, exchange rates are again the appropriate currency converters.

There is some controversy about calculating contributions to international organizations such as the United Nations and its specialized agencies, which are determined according to the GDP or GNI of member countries. Should the GDP/GNI used for that purpose be based on PPPs or exchange rates? On one hand, it can be argued that rates of contribution should be assessed in line with the real volumes of goods and services underlying each member country’s GDP; that is an argument for using PPPs. On the other, contributions are made in a common currency such as the US dollar, and countries have to purchase the dollar at exchange rates; that can be seen as an argument in favor of using exchange rates. Currently, the European Union levies some contributions on its member states in line with

The limitation of the ICP data should be seen from two perspectives. The first involves recognizing that there are areas where PPP data should not be used. The second relates to understanding the weak areas of the data in terms of data quality, country coverage and timeliness and taking appropriate precaution when using the data.

PPP-converted GDP, but contributions to the United Nations and its agencies are based on exchange rate-converted GDP and there are no plans to change that in the immediate future.

### Sampling and non-sampling errors

PPPs are statistical constructs and as such the quality of ICP data depends heavily on individual item prices and the associated basic heading expenditure estimates that are used as weights. The data are subject to both sampling and non-sampling errors. The sampling error associated with PPP estimation is a function of the sample size, in terms of the number of quotations, number of products selected for pricing in the survey and the outlets covered.

Whenever a sample is drawn, by definition, only the part of the population that is captured in the survey frame is taken into consideration, and is considered as representative of the entire population. The larger the sample size, the higher is the accuracy of the estimates. Conversely, the smaller the number of products and outlets covered, the larger is the sampling error. Cost and practical considerations limit the number of products selected for pricing, as well as the outlets visited. The quality of the ICP results is, therefore, subject to sampling errors.

Survey estimates are in general affected by a variety of non-sampling errors. In that context, the most significant non-sampling or measurement errors may also originate from problems in matching product quality and processing data. Problem in the results of the comparison could also arise from differences in the treatment of certain problem categories, often referred to as “comparison resistant” items (see section IV). Naturally, both the sampling and non-sampling errors vary across different components of GDP. Despite all the efforts, data may yield implausible results in some areas. For example, it is generally recognized that comparisons of services are more

prone to error than comparisons of products. Users should recognize that comparisons for housing, health and education sectors have wider margins of error than the comparisons, for example, for food products.

Another source of non-sampling errors relates to the problem of estimating national annual average prices when those may have been collected in only a few cities or regions, and when prices may have been observed in only one or two periods in a year. Users need to realize that some degree of incomparability cannot be avoided in some areas. Aside from problems associated with price data, there are other sources of non-sampling errors stemming from differences in the compilation of national accounts expenditure weights.

### 1.5 A BRIEF HISTORICAL OVERVIEW

In 1968, the UN Statistical Commission approved the International Comparison Program as a research project aimed at finding better ways of comparing national accounting aggregates other than the existing exchange rate conversion method. Located at the University of Pennsylvania under the direction of late Professor Irving B. Kravis, the program was funded by the United Nations, the Ford Foundation and the World Bank. Ten countries took part in its first round of comparison in 1970. Rounds II and III of ICP took place in 1972 and 1975 covering 16 and 34 countries respectively. The number of participating countries rose to 60 in 1980 and to 64 in 1985.

Although the number of participants kept growing from one round to the next, the increase was not smooth. Some participants from developing regions dropped out because of several factors, notably financial constraints. Data quality fell as funding proved difficult to mobilize. As a result, the 1990 coverage of the program shrank to only 30 countries from Europe and OECD.

In the meantime, demand for PPP data grew, especially in analytical research,

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.....

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.....

The most significant non-sampling or measurement errors may also originate from problems in matching product quality and processing data.

aided by publications of the World Bank and the University of Pennsylvania relating to PPP-based time-series estimates of GDP data for virtually all the countries of the world. The estimates were based on benchmark survey data extrapolated to non-benchmark countries and years employing various econometric methods. While the data were gaining in popularity, the extrapolations started to become increasingly weak as the coverage, continuity and timeliness of surveys began to falter.

In 1993, an attempt to jump-start the program ended with mixed results. The number of participating countries rose significantly – to 118, covering all regions of the world, including eight from Western Asia (Bahrain, Egypt, Jordan, Lebanon, Oman, Qatar, the Syrian Arab Republic and Yemen). But some regions took an unusually long time to process their data and the quality of the resulting global PPP estimates failed to meet the required standards. The results were published only at the most aggregate levels, household consumption and GDP. The very survival of the program was at stake.

An independent evaluation, commissioned jointly by the World Bank, IMF and the UN to assess the viability of the program, was undertaken in 1999. The Ryten report, named after its author, Jacob Ryten, concluded that the program had been poorly managed, under-funded and fraught with unacceptable data quality, lack of timeliness, transparency and soundness in its methods and operations.

However, the same report also stressed that the ICP is much too important to the development community to be discarded altogether. Highlighting its positive aspects, the report said the program provides critical insight into the comparative structure of the world economy and serves as a crucial information base for major global initiatives, such as the Millennium Development Goals.

The positive note spurred a global effort to embark on a new beginning. Learning from the experience of past ICP rounds and building on the recommendations offered in the Ryten report, a new strategic framework was developed by a consortium of international institutions led by the World Bank. Together with examining the conceptual and technical principles, the sponsors recalibrated the program aligning it more with national statistical work.

Widely endorsed by the development community, the new framework set out concerted remedial action to be undertaken by international and regional agencies in conjunction with national statistical offices. Furthermore, the framework called for close scrutiny of the data collection and validation protocols, compilation and aggregation methods, as well as operations and management of the program. The 2005 round thus marks a watershed in the program's history, which saw the participation of a record 146 countries from six regions. An important distinction of the current round is the widely shared recognition that the program has witnessed significant improvements. The results are, therefore, considered to be far better than the previous rounds.

## **1.6 NEW ICP GOVERNANCE AND MANAGEMENT STRUCTURE**

The ICP is essentially a global undertaking, and hence the new framework provides for effective global management under the auspices of a consortium of national, regional and international organizations. A new governance structure was put in place, including an international secretariat based at the World Bank headquarters, to manage the day-to-day coordination of the global program along with regional ICP secretariats mandated to implement the program in their respective regions. National ICP coordinators were appointed to plan, manage and undertake price surveys. An Executive Board – consist-

	Region	Number of participants	Regional coordinator
1	Africa	48	African Development Bank
2	Asia and Pacific	23	Asian Development Bank
3	CIS	10	Russian Statistical Agency and Commonwealth of Independent States
4	Western Asia	11	UN Economic and Social Commission for Western Asia
5	South America	10	UN Economic Commission for Latin America and Statistics Canada
6	OECD/EU	46	OECD and Eurostat
		146*	

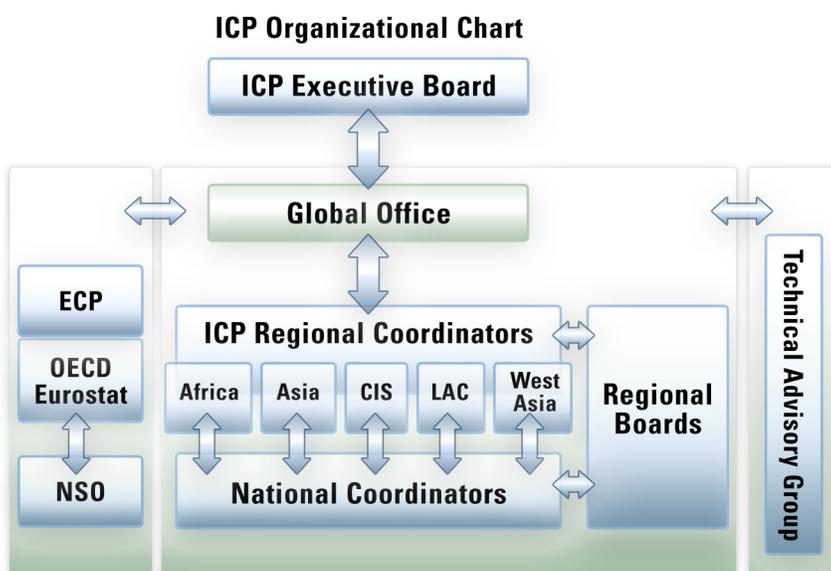
\* The total for all regions is 148 but Egypt and Russia each participated in two regional comparisons.

ing of distinguished statistical managers with sufficient representation from all regions of the world – was formed to set strategic priorities and oversee the program's implementation.

Regional executive or advisory boards were established to oversee implementation of programs incorporating regional objectives and priorities. A group of distinguished scholars and experts provide guidance and valuable advice to tackle methodological problems (see ICP Organizational Chart above).

The Eurostat-OECD Comparison Project covers all countries that belong to the European Union or to the OECD, plus eight other countries that belong to neither – Albania, Bosnia-Herzegovina, Croatia, Israel, Montenegro, Macedonia, Russia and Serbia. The Project is often referred to as the European Comparison Program (ECP), although it includes seven non-European countries that are members of the OECD – Australia, Canada, Japan, the Republic of Korea, Mexico, New Zealand, and the United States.

The Eurostat-OECD Comparison Project has its own governance structure but works closely with the ICP Global Office. The results for the Commonwealth of Independent States (CIS) were linked to global data through Russia working as a bridge country, connecting the CIS to the ECP.



### 1.7 PROGRAM IMPLEMENTATION

Up until the 1980 ICP round, the program was managed under a single system where all participating countries collected prices for the same list of specifications and global PPPs were calculated based on world average prices. As the number of countries increased, the complexity of comparing countries at various levels of development necessitated a different management and coordination modality. As the number of participating countries kept growing, no single international organization was in a position to take on the task of a direct world comparison of all countries. For the 2005 ICP, the world was divided into

several regions or economic groups (e.g., Asia, Africa, etc) and regional agencies, such as development banks and UN agencies assumed increased role in managing the program within their respective areas of responsibilities. The regular Eurostat-OECD comparison formed also part of the ICP 2005, although it has some organizational and methodological differences. Apart from overcoming the coordination and management problem, the great advantage of regionalizing the ICP is that the average prices better reflect the price structure and the expenditure patterns of the region than those generated from world average prices from a common global basket of goods and services.

As discussed above, regionalization means that the PPPs had to be generated in two steps. First, sets of regional PPPs are calculated from regional comparisons, each based on its own average prices of goods and services reflecting its expenditure patterns. The regional PPPs are expressed either in the national currency of one of the countries in the region (euros, Hong Kong dollars, Argentinean peso, etc) or in an artificial

regional currency obtained as a weighted average of all currencies in the region. The second step involves linking the regional PPPs to generate globally consistent PPPs in a common currency, often the US dollar. The method of linking is described in detail in Annex II.

Coordination of ICP and ECP is achieved through harmonization of work plans and schedules, as well as standardization of survey procedures and data processing practices. Regular meetings are conducted between managers of the ICP global and regional offices and managers of the ECP and CIS to ensure effective coordination. Such meetings are often attended by members of the Technical Advisory Group aimed at addressing methodological and technical issues.



# 2

## RESULTS OF THE 2005 WESTERN ASIA COMPARISON

This chapter presents the most recent estimates of incomes and price levels for Western Asia countries. The results are based on detailed price and expenditure comparisons, with 2005 as the reference year. An important distinction of the current round is the widely shared recognition that the program has witnessed significant improvements in coordination and management, as well as in data collection, validation and processing methods. The results are, therefore, considered far better than previous estimates generated by the program. It is, however, acknowledged that PPP data are statistical constructs and as such, the quality of the results depends on the underlying price and national accounts input data submitted by the participating countries, with varying degrees of quality. The robustness of the data will no doubt continue to improve in future rounds as participating countries build their capacities.

Only highlights of the regional comparison, covering higher-level aggregates are presented. The selection of data for presentation is guided by two factors. First, only aggregates that are deemed to be robust in terms of quality are presented. As noted in section 3.5, the expenditure data at lower aggregate levels are less reliable than those at higher levels of aggregation, stemming from a problem with national accounts information. The second consideration is the importance of the data to inform policy. For example, although

the results of comparison for housing, health and education may not be as robust as estimates for food and clothing items, they are shown because of their importance for research and policy-making. They are presented with a caveat that users should appreciate their limitations.

In addition to what is published here, more detailed information is available upon request. Such data may include basic heading expenditures and PPPs for a total of 100-plus lines. The detailed information provides much insight into the price relatives of different expenditure categories for research purposes, but its use should be restricted to research and even then with appropriate precaution and caveats. Request for regional data may be directed to UN-ESCWA. Request for global estimates covering more than one region should be directed to the ICP Global Office

The results of the Western Asia regional comparison are presented in a series of tables that will follow. It may be mentioned that the ICP for the Western Asia region delivers a set of PPPs for GDP and its various subcomponents for all the 11 countries participating in the exercise. The PPPs are then used to convert local currency values to a common regional currency. The results are called “real” values. When national currency GDP is converted by PPPs, the result is referred to as real GDP or real output. In contrast, exchange rate-based estimates are referred to as nominal. The practice is in line with the convention of



calling constant price series real and current price series nominal in national accounts data time-series presentation. In ICP lexicon, the term “real” is used in reference to PPP-based estimates.

### 2.1 WESTERN ASIA CURRENCY (WAC)

Once transitive PPPs to a base country are calculated, then the national and regional GDPs in real terms can be expressed in any currency, so long as the ratios of national-to-regional PPPs and real expenditures are preserved. In other words, a common currency to express expenditures can come from one of the participating countries or from a country outside the region itself.

In Western Asia, it was decided to express real GDP figures in a neutral currency unrelated to any particular currency in the region. Similar procedures were used for the Asia Pacific, Latin America and Africa regions. For that purpose, an artificial Western Asia currency (WAC) unit was created. It must be noted that the procedure is base country-invariant, which means the choice of the base country (or in that case regional currency) will not alter the relative positions of the countries. If for example, country A is 200 per cent richer than country B, their relative position would remain the same whether the results are expressed in WAC, Egyptian pound, Omani rial or any other currency from the other nine participating countries.

WAC was constructed in such a way that the sum of the real national GDPs expressed in WAC equals the sum of those GDPs when they are converted from local currencies into US dollars using the official exchange rates. The PPPs for the region were first computed in terms of the currency of the base country- Oman. Those PPPs were used to express real GDPs of the 11 countries in terms of the Omani rial. The real GDPs of those countries were summed up to obtain the GDP for the region using the Omani rial. That was divided into the

sum of the GDPs of those countries in local currencies converted to US dollars at market exchange rates. The result was a factor, a scalar, which was used to multiply all real values to convert them from Omani rial to WAC, which may be characterized as a kind of Western Asia dollar. However, its purchasing power is different from that of the US dollar because it is based on the expenditure weights and price structures of Western Asian countries and not of the United States.

The use of WAC in that case is equivalent to setting the exchange rate as 1:1 between the US dollar and the WAC at the regional aggregate level, but it does not imply that the purchasing power of 1 WAC is the same as the purchasing power of 1 dollar in the United States in real terms. WAC is not a reflection of market reality, but a statistical artifact. The final parity between the US dollar and the WAC is established when the global comparison, linking all regional PPPs to establish a globally consistent PPP, is finalized.

Readers should note that the PPPs presented here have been computed using the Èltetö, Köves, and Szulc (EKS) method. The main advantage of the EKS is that it gives good comparison of one country with another within the same aggregate with minimal influence from third countries. However, its downside is that for a country, the numbers in one aggregate are not strictly comparable to those in another because EKS lacks additive consistency, which means the real values of components do not add up to totals.

Another commonly used method, the Geary-Khamis (GK) method, has additive consistency - components add up to totals. However, it is subject to what is called the “Gerschenkron effect”, which means that the valuation of a county’s quantities tends to be higher if a price structure is much different from its own and is used as the basis of the valuation. Since the average inter-

In Western Asia, it was decided to express real GDP figures in a neutral currency unrelated to any particular currency in the region. For that purpose, an artificial Western Asia currency (WAC) unit was created.

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The introduction of WAC to express the real values of the region has made it possible to present the results in such a way so that the Price Level Index (PLI) for GDP for the region as a whole becomes equal to 100. Each index, therefore, measures the extent to which it differs from the weighted average for all the countries participating in the regional exercise. A PLI of 100 indicates that price level in the country is the same as the average for the region.

national price used by GK is quantity weighted, the average tends to reflect price structures of larger and richer countries in the group, causing the values of poorer and smaller countries to be high. For that reason, GK method is not used as official estimates of the Western Asia program. Readers who are interested in detailed description of the GK method may refer to Annex II.

## 2.2 SUMMARY OF THE PRELIMINARY FINDINGS

Table 1 provides key statistics, such as population, exchange rates and total GDP in local currencies and exchange rate terms, as well as summary of PPP data including PPP rates, PPP-adjusted GDP estimates expressed in WAC and price level index (PLI), which is defined as the *ratio of PPP to market rate of exchange*. The introduction of WAC to express the real values of the region has made it possible to present the results in such a way so that the PLI for GDP for the region as a whole becomes equal to 100. Each index, therefore, measures the extent to which it differs from the weighted average for all the countries participating in the regional exercise. A PLI of 100 indicates that price level in the country is the same as the average for the region.

### Comparison of real GDP and its major components

Saudi Arabia and Egypt are the two largest economies in Western Asia accounting for over 60 per cent of the region's total real GDP. Measured in PPP terms, Saudi Arabia accounts for 36 per cent of the region's total output, showing a notable drop when compared to the country's 45 per cent share in exchange rate terms. In contrast, Egypt accounts for 25 per cent of the region's total GDP in PPP terms compared to a 14 per cent share when its local currency-denominated GDP is converted by exchange rate. Measured in PPP terms, Bahrain and Jordan account for less than 2 per cent

Table 1. Key statistics and summary PPP estimates and related GDP data

Country	Population in millions	Total GDP			Total GDP		Purchasing Power Parity per WAC	Exchange rate per US dollar	Price level index
		National Currency (Millions)	WAC in Purchasing Power Parity	Region = 100	US dollars in exchange rates	Region = 100			
Bahrain	0.74	5,031	10,523	1.52	13,380	1.93	0.48	0.38	127
Egypt	70.00	571,129	173,884	25.04	98,832	14.23	3.28	5.78	57
Iraq	27.96	49,990,680	46,557	6.70	33,938	4.89	1073.76	1473.00	73
Jordan	5.47	8,942	12,227	1.76	12,611	1.82	0.73	0.71	103
Kuwait	2.46	23,593	57,468	8.27	80,798	11.63	0.41	0.29	141
Lebanon	3.76	32,499,000	19,952	2.87	21,558	3.10	1628.83	1507.50	108
Oman	2.51	11,856	26,545	3.82	30,834	4.44	0.45	0.39	116
Qatar	0.81	153,290	29,054	4.18	42,113	6.06	5.28	3.64	145
Saudi Arabia	23.12	1,182,514	255,260	36.75	315,337	45.40	4.63	3.75	124
Syria	18.49	1,479,667	39,048	5.62	28,379	4.09	37.89	52.14	73
Yemen	20.25	3,208,501	24,024	3.46	16,762	2.41	133.55	191.42	70
<b>Region</b>	<b>175.604</b>		<b>694,542</b>	<b>100.00</b>	<b>694,542</b>	<b>100.00</b>			

each of the regional output, Lebanon for less than 3 per cent, and Yemen and Oman for less than 4 per cent each.

*Actual final household consumption (AFHC):* When considering AFHC, a measure of what households actually consume both in terms of direct purchases and government services for their individual use such as health and education, Egypt takes the lion's share of the regional total (see table 2).

Egypt accounts for 38 per cent, followed by Saudi Arabia (24 per cent), the Syrian Arab Republic (8 per cent) and Iraq (7.7 per cent). In contrast, when exchange rate estimates are used, Saudi Arabia accounts for 35 per cent of the regional total, considerably higher than that of Egypt, which represents only 23 per cent. The significant difference between the relative positions of Saudi Arabia and Egypt in PPP and exchange rate-based estimates reflects the underlying difference in their price levels. Egypt's price level (the lowest in the region) is 60 per cent of the regional average. In contrast, Saudi Arabia's price level is 146 per cent of the regional average.

*Gross fixed capital formation:* GFCF measures a country's investment expenditures, which mostly comprise purchases of equipment and construction services. Saudi Arabia dominates the region's investment with a 39 per cent share, followed by Egypt that accounts for 17 per cent (see table 3). Qatar and Kuwait - each represents slightly less than 9 per cent of the region's total investment. The total for Egypt, Qatar and Kuwait combined is 35 per cent, slightly less than the share of Saudi Arabia. In general, the picture does not change significantly when exchange rate values are used. Saudi Arabia remains the highest investor accounting for 42 per cent of the regional total. Egypt's share of 13.4 per cent is slightly more than that of Qatar, which is 11.4 percent. Egypt, Qatar, and Kuwait together account for 34 per cent of the regional total. There are, however, notable changes for some

Table 2. Actual final household consumption in PPP and exchange rates

Country	Total AFHC		Total AFHC		Total AFHC		PPP per WAC	XR rate per US dollar	Price level index
	National Currency (Million)	WAC in PPP (Million)	Region = 100	US dollars (XR) (Million)	Region = 100				
(1)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
Bahrain	2,639	4,598	1.37	7,017	2.09	0.57	0.38	153	
Egypt	439,390	12,6662	37.78	76,035	22.68	3.47	5.78	60	
Iraq	28,168,832	25,787	7.69	19,123	5.70	1,092.37	1,473.00	74	
Jordan	8,692	10,290	3.07	12,260	3.66	0.84	0.71	119	
Kuwait	8,981	17,165	5.12	30,757	9.17	0.52	0.29	179	
Lebanon	29,460,073	15,159	4.52	19,542	5.83	1,943.44	1,507.50	129	
Oman	4,821	9,181	2.74	12,539	3.74	0.53	0.39	137	
Qatar	33,579	5,079	1.51	9,225	2.75	6.61	3.64	182	
Saudi Arabia	435,734	79,790	23.80	116,196	34.65	5.46	3.75	146	
Syria	1,098,132	26,930	8.03	21,061	6.28	40.78	52.14	78	
Yemen	2,210,804	14,663	4.37	11,549	3.44	150.78	191.42	79	
<i>Region</i>		<i>335,305</i>	<i>100.00</i>	<i>335,305</i>	<i>100.00</i>				

Table 3. Gross fixed capital formation (GFCF)

Country	Total GFCF		Total GFCF		Total GFCF		PPP per WAC	XR rate per US dollar	Price level index
	National Currency (Million)	WAC in PPP (Million)	Region = 100	US dollars (XR) (Million)	Region = 100				
Bahrain	893	2,277	1.83	2,376	1.91	0.39	0.38	104	
Egypt	96,226	21,761	17.48	16,652	13.38	4.42	5.78	77	
Iraq	4,757,878	3,420	2.75	3,230	2.60	1391.26	1473.00	95	
Jordan	2,734	3,808	3.06	3,856	3.10	0.72	0.71	101	
Kuwait	3,451	10,681	8.58	11,820	9.50	0.32	0.29	111	
Lebanon	7,137,000	5,119	4.11	4,734	3.80	1394.30	1507.50	93	
Oman	2,138	5,458	4.39	5,559	4.47	0.39	0.39	102	
Qatar	51,560	10,799	8.68	14,165	11.38	4.77	3.64	131	
Saudi Arabia	195,632	48,829	39.23	52,169	41.91	4.01	3.75	107	
Syria	350,181	7,791	6.26	6,716	5.40	44.94	52.14	86	
Yemen	610,198	4,520	3.63	3,188	2.56	135.00	191.42	71	
<i>Region</i>		<i>124,464</i>	<i>100.00</i>	<i>124,464</i>	<i>100.00</i>				

countries. For example, in exchange rate terms, Qatar's share is 11.4 per cent, 15 per cent less than that of Egypt, which represents 13.4 per cent of the region's total investment. In contrast, when measured in PPP terms, Qatar's share drops to 8.7 per cent, significantly lower than that of Egypt, which accounts for 17.5 per cent of the regional total

*Collective government expenditures:* They consist of expenditures incurred by general and local government for collective consumption services such as defense, justice, general administration and the protection of the environment. When PPP estimates are the basis of comparison, Saudi Arabia represents the largest share of the regional total in government expenditure as well, accounting for 33.5 per cent; Egypt and Iraq represent 20 per cent each. The differences between exchange rate and PPP-based estimates are more significant with government expenditure than with the other components of GDP (see table 4).

### Comparison of real per capita GDP and its major components

In terms of real per capita GDP, Qatar is the richest country in the region with \$35,744, which is more than nine times the regional average. It is followed by Kuwait (\$23,387), Bahrain (\$14,171), Saudi Arabia (\$11,041) and Oman (\$10,580) (see table 5). Each of those five participating countries, which are members of the Gulf Cooperation Council (GCC) has a per capita GDP higher than the regional average. Lebanon is the richest among the non-GCC countries with a per capita GDP of \$5,313. Its per capita exceeds the regional average by 34 per cent. All the other non-GCC countries fall below the regional average in terms of per capita GDP with Egypt followed by Jordan, the Syrian Arab Republic, Iraq and Yemen respectively.

In terms of ranking, there is no significant difference between PPP and

Country	Total Col. Gov.		Total Col. Gov.		Total Col. Gov.		Exchange rate per US dollar	Price level index
	National Currency	WAC in Purchasing Power Parity	Region = 100	US dollars in exchange rates	Region = 100	Purchasing Power Parity per WAC		
Bahrain	327	579	0.76	871	1.14	0.57	0.38	151
Egypt	40,772	15,279	20.06	7,056	9.26	2.67	5.78	46
Iraq	13,689,829	15,044	19.75	9,294	12.20	910.01	1,473.00	62
Jordan	857	1,549	2.03	1,209	1.59	0.55	0.71	78
Kuwait	2,311	4,387	5.76	7,916	10.39	0.53	0.29	180
Lebanon	3,083,927	2,250	2.95	2,046	2.69	1,370.83	1,507.50	91
Oman	1,645	3,595	4.72	4,279	5.62	0.46	0.39	119
Qatar	11,407	1,972	2.59	3,134	4.11	5.78	3.64	159
Saudi Arabia	139,874	2,5520	33.50	37,300	48.96	5.48	3.75	146
Syria	95,182	3,351	4.40	1,826	2.40	28.41	52.14	55
Yemen	240,674	2,661	3.49	1,257	1.65	90.44	191.42	47
Region		76,186	100.00	76,186	100.00			

Country	Per capita GDP		Per capita GDP		Per capita GDP		XR rate per US dollar	Price level index
	National Currency	WAC in PPP	Region = 100	US dollars in (XR)	Region = 100	PPP per WAC		
Bahrain	6,775	14,171	358.29	18,019	455.59	0.48	0.38	127
Egypt	8,159	2,484	62.81	1,412	35.70	3.28	5.78	57
Iraq	1,787,746	1,665	42.10	1,214	30.69	1,073.76	1,473.00	73
Jordan	1,634	2,234	56.48	2,304	58.26	0.73	0.71	103
Kuwait	9,601	23,387	591.30	32,882	831.36	0.41	0.29	141
Lebanon	8,654,782	5,313	134.34	5,741	145.16	1,628.83	1,507.50	108
Oman	4,725	10,580	267.50	12,289	310.71	0.45	0.39	116
Qatar	188,585	35,744	903.73	51,809	1,309.91	5.28	3.64	145
Saudi Arabia	51,149	11,041	279.16	13,640	344.86	4.63	3.75	124
Syria	80,034	2,112	53.40	1,535	38.81	37.89	52.14	73
Yemen	158,179	1,184	29.95	826	20.89	133.55	191.42	70
Region		3,955		3,955				

Country	Per capita AFHC		Per capita AFHC		Per capita AFHC		Exchange rate per US dollar	Price level index
	National Currency	WAC in PPP	Region = 100	XR	Region = 100	PPP per WAC		
Bahrain	3,553	6,192	324.30	9,450	494.93	0.57	0.376	153
Egypt	6,277	1,809	94.76	1,086	56.89	3.47	5.779	60
Iraq	1,007,362	922	48.30	684	35.82	1,092.37	1473.000	74
Jordan	1,588	1,880	98.47	2,240	117.31	0.84	0.709	119
Kuwait	3,655	6,985	365.84	12,517	655.53	0.52	0.292	179
Lebanon	7,845,488	4,037	211.42	5,204	272.56	1,943.44	1,507.500	129
Oman	1,922	3,659	191.65	4,997	261.72	0.53	0.385	137
Qatar	41,310	6,248	327.23	11,349	594.36	6.61	3.640	182
Saudi Arabia	18,847	3,451	180.75	5,026	263.22	5.46	3.750	146
Syria	59,397	1,457	76.29	1,139	59.66	40.78	52.140	78
Yemen	108,992	723	37.86	569	29.82	150.78	191.420	79
Region		1,909		1,909				

exchange rate except for Egypt, Jordan and the Syrian Arab Republic. The significant difference is mainly in the magnitude of per capita estimates. For example, in terms of exchange rate estimates, Qatar's per capita value is 63 times that of Yemen, the poorest in the region. If PPP estimates are used instead, Qatar is only 30 times richer. It is 4.2 times richer than Oman in exchange rate terms, but when PPP estimates are used for comparison, it's only 3.4 times richer (see figure 5).

When looking at per capita actual final household consumption, Kuwait tops the list, followed by Qatar, Bahrain and Lebanon. The range of differences in per capita household consumption among the 11 countries is much less than that in per capita real GDP. Per capita real consumption in Kuwait, for example, is 10 times greater than that in the lowest economy (Yemen), compared with a factor of 20 times when per capita real GDP is the base of comparison (see table 6).

The rankings of the countries in collective government consumption in real terms follow those observed in nominal terms, but they are not the same as in per capita GDP. Differences in the proportion of GDP devoted to government consumption, combined with differences in PLI make the rankings a little different. Kuwait, Bahrain and Saudi Arabia have relatively high PLI, driving down their relative value of government consumption, while Egypt and Iraq have relatively low PLI, which raise their real values (see table 7).

The significance of GFCF is seen less in the change of ranking, which occurs to some extent, but in the fact that Saudi Arabia, Egypt and Iraq are losing ground, and Jordan, the Syrian Arab Republic and Yemen are gaining relative to their per capita real GDP. However, the disparity in level of GFCF is staggering. Compared with Iraq, the country with lowest value for GFCF, Qatar is over 150 times higher in nominal terms and

108 times higher in real terms. Qatar stands out as a country with exceptionally high value for investment. The next country, Kuwait, has GFCF of about 36 times higher than Iraq in real terms and 42 times in nominal terms. Looking at the lower-income countries, their investment ratios in nominal terms are already low and combined with relatively high PLI, the real investment ratios are really low (see table 8).

### Comparison of price level indices

A price level index (PLI) is defined as the ratio of PPP to the corresponding exchange rate. It is usually presented in percentage terms. PLIs are used to compare price levels between economies. They indicate the price of GDP (or its components) in an economy if it were "purchased" after acquiring local currency at the prevailing exchange rate. PLIs are generally low in the poorest economies. But it is also possible to see countries at the same level of development showing different PLIs.

Table 9 shows the relative price levels in each country for GDP and a selected number of its components - actual final household consumption, collective government expenditures and GFCF. The PLI of 1.27 for GDP of Bahrain means that the overall price level is 27 per cent higher in Bahrain compared with the region as a whole. The corresponding number for Egypt is 0.57. It means that the overall price level in Egypt is 43 per cent lower compared with the regional average. It also means that the purchasing power of one US dollar in Egypt is equivalent to an average of  $(1.272/0.568)$  2.24 US dollars in Bahrain. The PLI for each of the other aggregates is also expressed relative to the regional average, which is set equal to 1.0 (table 9).

In terms of GDP, Qatar tops the ranking of PLI, followed by Kuwait, Bahrain, Saudi Arabia and Oman - all GCC members. Among the other six participating countries, price levels in Lebanon and

Jordan are still higher than the regional average. The remaining four countries - Iraq, the Syrian Arab Republic, Yemen and Egypt - have price levels that are lower than the regional average, with Egypt being the least expensive.

One feature of PPP conversion is its ability to distinguish price levels for different segments of GDP, down to basic headings, as the differences in prices are captured by their respective PPPs. The distinction is not possible in exchange rate conversion as the same rate is applied regardless of the item of expenditure. That PLI ranking in GDP more or less holds for individual, as well as collective government consumption. In terms of individual consumption, Iraq and Yemen, both change two places - Iraq moving down two ranks and Yemen moving up two. For collective government consumption, Kuwait and Qatar exchange places - Qatar moving down from rank one to two, while Kuwait moving up from two to one (see figure 6). For GFCE, seven of the 11 countries have different ranks for GDP. Lebanon, Bahrain and Yemen moved down, while Egypt, Iraq, Jordan and Saudi Arabia moved up.

It is apparent that the price disparity among countries is quite high: at the GDP level, the price level in Qatar is higher than that of Egypt by a factor of over 2.5 ( $1.450/0.568 = 2.55$ ). The disparity increases at the level of individual and collective government consumption. For individual consumption, the PLI of the most expensive country (Qatar) differs from that of the least expensive (Egypt) by a factor of over 3 ( $1.816/0.60 = 3.03$ ). For collective government consumption, the disparity is even higher. PLI for Kuwait, the most expensive country, differs from that of Egypt, the least expensive, by a factor of almost 4 ( $1.804/0.462 = 3.9$ ). In GFCE, the difference between the most expensive country (Qatar) and the least (Yemen) is somewhat lower, 1.86 ( $1.312/0.705 = 1.86$ ).

Figure 5. Real GDP vs. Nominal GDP - USD

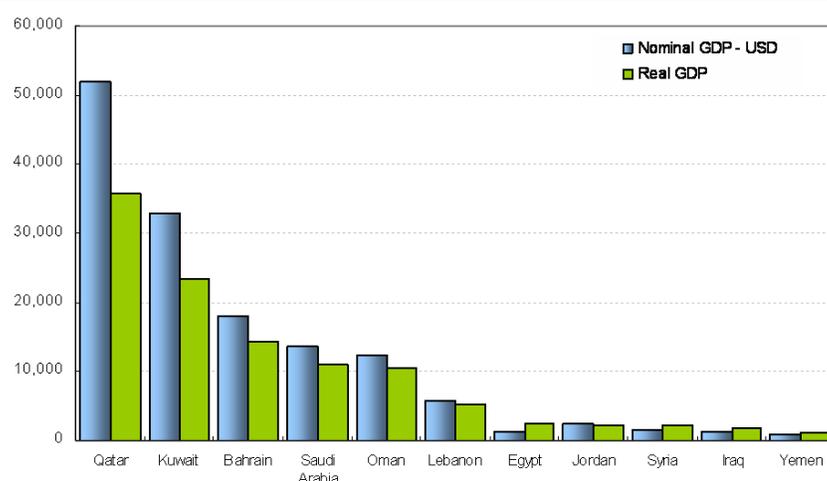


Table 7. Per capita government expenditure

Country	Per capita Col. Gov.		Per capita Col. Gov.		PPP per WAC	Exchange rate per US dollar	Price level index	
	National Currency	WAC in PPP	Region = 100	XR				
Bahrain	441	779	180	1,173	270	0.57	0.38	150
Egypt	582	218	50	101	23	2.67	5.78	46
Iraq	489,570	538	124	332	77	910.01	1,473.00	62
Jordan	157	283	65	221	51	0.55	0.71	78
Kuwait	941	1,785	412	3,221	742	0.53	0.29	180
Lebanon	821,278	599	138	545	126	1,370.83	1,507.50	91
Oman	656	1,433	330	1,706	393	0.46	0.38	119
Qatar	14,034	2,427	559	3,855	889	5.78	3.64	159
Saudi Arabia	6,050	1,104	254	1,613	372	5.48	3.75	146
Syria	5,148	181	42	99	23	28.41	52.14	54
Yemen	11,865	131	30	62	14	90.44	191.42	47
<b>Region</b>		<b>434</b>		<b>434</b>				

Table 8. Per capita gross fixed capital formation

Country	National Currency	WAC in Purchasing Power Parity		US dollars in exchange rates	Region = 100	Purchasing Power Parity per WAC	Exchange rate per US dollar	Price level index
		Region = 100	Region = 100					
Bahrain	1,203	3,066	432.57	3,199	451.40	0.39	0.38	104
Egypt	1,375	311	43.86	238	33.56	4.42	5.78	77
Iraq	170,149	122	17.25	116	16.30	1,391.26	1,473.00	95
Jordan	499	696	98.17	705	99.40	0.72	0.71	101
Kuwait	1,405	4,347	613.27	4,810	678.67	0.32	0.29	111
Lebanon	1,900,649	1,363	192.32	1,261	1,77.88	1,394.30	1,507.50	93
Oman	852	2,175	306.93	2,216	312.62	0.39	0.39	102
Qatar	63,432	13,286	1,874.50	17,426	2,458.64	4.77	3.64	131
Saudi Arabia	8,462	2,112	297.99	2,257	318.37	4.01	3.75	107
Syria	18,941	421	59.46	363	51.25	44.94	52.14	86
Yemen	30,083	223	31.44	157	22.17	135.00	191.42	71
<b>Region</b>		<b>709</b>		<b>709</b>				

The picture of the region painted by PLI is hardly surprising. More affluent countries have relatively higher price levels. Detailed data at the basic heading level show that services are generally relatively expensive in more affluent countries. Since collective government consumption consists mostly of wages and salaries, the price disparity there is more pronounced. In GFCF, the disparity is more subdued because a large proportion consists of imported items for which all importers, regardless of their level of income, face similar prices in international markets.

### Correlation between price level and per capita GDP

As mentioned before, PLI is positively correlated with per capita income as shown in Table 10. Only Jordan and Egypt fall out of line with Jordan's PLI being too high and Egypt's being too low relative to their corresponding levels of income in the region. That is reflected in figure 7. Several reasons explain Jordan's relatively high PLI. Jordan is a small country with limited agricultural, water and energy resources. While potash and phosphates are its major export items, the country largely depends on imports for its energy sources. The war in Iraq disrupted Jordan's primary oil supply route from its eastern neighbor, which under President Saddam Hussein had provided the kingdom with highly discounted crude oil. That arrangement ended with the overthrow of Saddam's regime, forcing the government of Jordan to increase fuel subsidies. However, in early 2004, the government announced intentions to gradually eliminate subsidies over a four-year period and in line with a pricing formula that would include taxes.

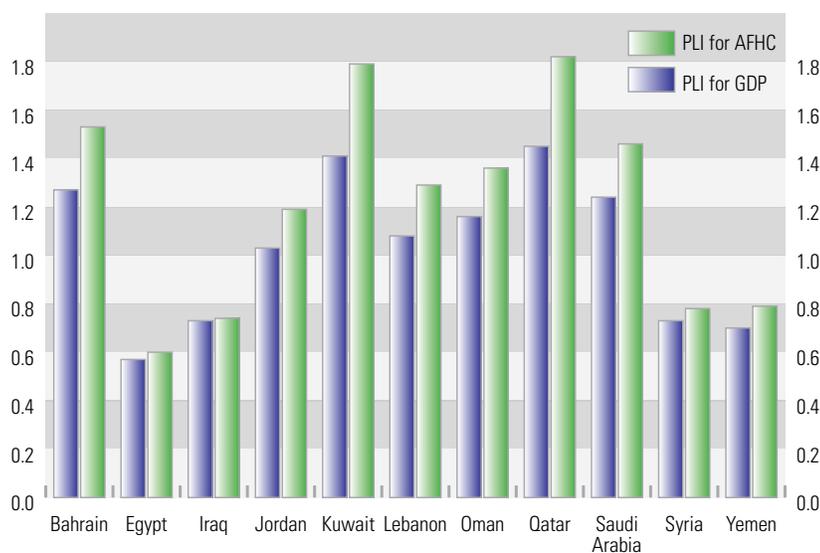
Thus, the increased oil prices and reductions in government subsidies on oil and oil-products contributed significantly to Jordan's inflationary pressures. Moreover, since the war started in 2003, the influx of large numbers of

Table 9: Price level results in WAC region = 1.0

	XR	GDP		Actual Final Household Consumption		Collective Government		Gross Fixed Capital Formation	
		PLI	Rank	PLI	Rank	PLI	Rank	PLI	Rank
Qatar	3.64	1.45	1	1.82	1	1.59	2	1.31	1
Kuwait	0.29	1.41	2	1.79	2	1.80	1	1.11	2
Bahrain	0.38	1.27	3	1.53	3	1.51	3	1.04	4
Saudi Arabia	3.75	1.24	4	1.46	4	1.46	4	1.07	3
Oman	0.39	1.16	5	1.36	5	1.19	5	1.02	5
Lebanon	1,507.50	1.08	6	1.29	6	0.91	6	0.93	8
Jordan	0.71	1.03	7	1.19	7	0.78	7	1.01	6
Iraq	1,473.00	0.73	8	0.74	10	0.62	8	0.95	7
Syria	52.14	0.73	9	0.78	9	0.55	9	0.86	9
Yemen	191.42	0.70	10	0.79	8	0.47	10	0.71	11
Egypt	5.78	0.57	11	0.60	11	0.46	11	0.77	10

*WAC = Western Asia Currency explained in the text; XR = exchange rate of national currency per US dollar; PLI = price level index, (PPP/XR); Rank = rank based on PLI from highest to lowest; actual final household consumption = individual consumption expenditure by households plus individual consumption expenditure by government and NPISHs.*

Figure 6. PLI for GDP vs. PLI for actual final household consumption (AFHC)



Iraqi refugees to Jordan has led to the injection of excessive amounts of cash into the country, driving up prices and causing an inflationary price movement, especially on real estate. Adding to the increased Iraqi demand for exports from Jordan, the country experienced inflationary pressure both in its internal and external markets, especially on clothing and food items, such as vegetables and fruits.

Egypt, on the other hand, seems to have a relatively low PLI in 2005. That is due mainly to the substantial subsidies on Egyptian consumption products. Since the beginning of 1952, the government initiated a program for controlling prices both by indirect taxation and subsidies. It currently spends around LE100 billions of its annual budget on direct and indirect subsidies. Millions of Egyptians thus enjoy direct subsidies, especially on basic food items, and the government provides indirect subsidies on essential services, such as education, healthcare, energy and transportation. In industry, public enterprises pay subsidized rates for energy but have to sell their products to consumers at fixed, low prices. Moreover, endowed with oil, natural gas and coal, Egypt produces all the energy it consumes and also exports. The wage rate in Egypt is also very low. A fresh graduate from medical school makes less than \$1000 per annum. A schoolteacher with a bachelor degree and five years of experience makes less than \$1000 per annum. Thus, the significantly cheap energy coupled with low labor costs and wage rates serve to keep the Egyptian price level relatively low.

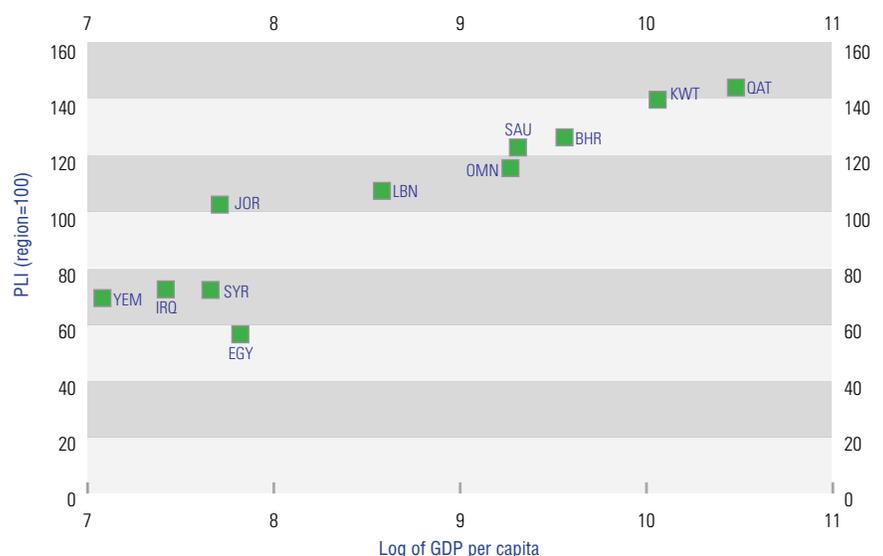
#### Analysis of price similarity indices

This analysis serves two important purposes. First, it provides valuable insight into a country's dynamics of price structures at different levels of aggregation. Second, it can answer questions such as where a country's price is similar or dissimilar to those of its neighbors

Table 10. Price level index for per capita GDP

	Log of Per capita GDP	PLI
Yemen	7.08	69.77
Iraq	7.42	72.90
Syria	7.66	72.68
Jordan	7.71	103.15
Egypt	7.82	56.84
Lebanon	8.58	108.05
Oman	9.27	116.16
Saudi Arabia	9.31	123.54
Bahrain	9.56	127.15
Kuwait	10.06	140.60
Qatar	10.48	144.94
Region	8.28	100.00

Figure 7. PLI for GDP per capita



or trading partners for GDP or for its components such as capital formation, consumption goods and government outlays.

One of the most common methods of calculating price similarity index is the ratio of Paasche to Laspeyres index, which measures Paasche - Laspeyres Spread (PLS). Countries with similar price structure will have a value of PLS close to 1, without being greater than 1. A PLS notably higher than 1 indicates either serious distortion in the price structure of the countries in question or non-comparability of their price structures.

Apart from PLS, there are other methods for calculating price similarity indices. The advantage of PLS is that it is easy to understand but its disadvantage is that it is affected by quantity differences. Two countries with quite similar price structure and significantly different expenditure structure can show low similarity index and vice versa. Table 11 shown below is based on the coefficient of similarity price structures driven from correlation of national price ratios.<sup>1</sup>

Looking at the average coefficient of similarity of price structure, Lebanon (0.44), Egypt (0.52) and Qatar (0.52) show relatively low figures when compared with the rest of the countries in the region. The Syrian Arab Republic and Yemen have 0.61 and 0.60 similarity coefficient, respectively. The remaining countries show 0.65 or higher with Oman (0.71) and Jordan (0.69) showing the highest similarity with the regional average.

Obviously, GCC countries on average show higher similarity with each other than with countries from the non-GCC

<sup>1</sup> S. Sergeev, "Measures of the similarity of the country's price structures and their practical application", a paper presented at Conference of European Statisticians, Geneva 12-14 November 2001; and S. Sergeev, "Aggregation Methods on the Basis of Structural International Prices", paper presented at a Joint World Bank OECD Seminar, 2001.

Table 11. Coefficients of similarity of price structures for GDP: ESCWA ICP 2005 comparison

	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	Egypt	Iraq	Jordan	Lebanon	Syria	Yemen
Bahrain	1.00	0.89	0.91	0.80	0.88	0.34	0.59	0.72	0.27	0.60	0.54
Kuwait	0.89	1.00	0.86	0.71	0.86	0.36	0.54	0.63	0.32	0.49	0.71
Oman	0.91	0.86	1.00	0.72	0.91	0.49	0.73	0.83	0.47	0.64	0.73
Qatar	0.80	0.71	0.72	1.00	0.71	0.23	0.46	0.58	0.18	0.42	0.70
Saudi Arabia	0.88	0.86	0.91	0.71	1.00	0.45	0.67	0.70	0.48	0.50	0.47
Egypt	0.34	0.36	0.49	0.23	0.45	1.00	0.70	0.60	0.63	0.65	0.47
Iraq	0.59	0.54	0.73	0.46	0.67	0.70	1.00	0.79	0.54	0.76	0.62
Jordan	0.72	0.63	0.83	0.58	0.70	0.60	0.79	1.00	0.53	0.78	0.42
Lebanon	0.27	0.32	0.47	0.18	0.48	0.63	0.54	0.53	1.00	0.47	0.55
Syria	0.60	0.49	0.64	0.42	0.50	0.65	0.76	0.78	0.47	1.00	0.82
Yemen	0.54	0.47	0.62	0.42	0.55	0.71	0.73	0.70	0.47	0.82	1.00
Average - Total	0.65	0.61	0.72	0.52	0.67	0.52	0.65	0.69	0.44	0.61	0.60
Average Gulf	0.87	0.83	0.85	0.74	0.84	0.37	0.60	0.69	0.34	0.53	0.52
Average Non-Gulf	0.51	0.47	0.63	0.38	0.56	0.66	0.70	0.68	0.53	0.70	0.69
Inter-country Max	0.89	0.86	0.91	0.72	0.91	0.71	0.79	0.83	0.63	0.82	0.82
Inter-country Min	0.27	0.32	0.47	0.18	0.45	0.23	0.46	0.53	0.18	0.42	0.42

group. For example, Bahrain's average similarity index of 0.87 with the other GCC countries is much higher compared to its average similarity index of 0.51 with respect to non-GCC countries. Bahrain has the highest similarity index with Oman (0.91) and Kuwait (0.89) and the lowest with Lebanon (0.27) and Egypt (0.34).

Similarly, on average non-GCC countries exhibit relatively higher coefficient of similarity with each other than they do with their GCC counterparts. For example, Egypt's average similarity index of 0.66 with the other non-GCC countries is notably higher compared to its average similarity index of 0.37 with respect to the average of its GCC neighbors. Egypt has the highest similarity index with Yemen (0.71) and Iraq (0.70) and the lowest with Qatar (0.23) and Bahrain (0.34).

Another interesting finding relates to similarity indices of Jordan and Oman. Both are of interest because they served as ring countries. The results confirm that the choice of the two countries as ring countries representing the region was a good decision. The ring comparison described in section 3.8 is a new method developed to link regional PPPs and establish globally consistent PPPs without changing the relative results within a region. Interestingly, Jordan's average similarity coefficient with respect to GCC countries (0.69) is virtually the same as its average similarity index with respect to its non-GCC counterparts (0.68). Oman's similarity index of 0.63 with the non-GCC countries as a group is the highest for a GCC country. The corresponding figures for Saudi Arabia (0.56), Bahrain (0.51), Kuwait (0.47) and Qatar (0.38) are notably lower.

Lebanon seems to hold a distinctive position within the region. Its similarity coefficient is the lowest both in the regional and non-GCC comparisons. That may be attributed to Lebanon's unique economic structure. Lebanon is a small

country and mainly relies on its services sector, which is concentrated on few services: banking, tourism, health and education. Its tradable sectors, such as industry and agriculture, are weak. Lebanon is also characterized by a consumption-driven economy with very low savings. It relies on external inflows, mainly remittances, to fund its high consumption level.

Lebanon has the highest similarity index of 0.63 with Egypt, from the non-GCC countries, and the lowest of 0.18 with Qatar, from the GCC countries. Lebanon's economic structure is very distinct from Qatar's, which is characterized by high investment level and net exports, while it is the closest to Egypt's economy, which also earns significant income from tourism and remittances. It should be noted that Egypt took part in both Africa and Western Asia comparisons. It also served as a ring country for the Africa region.

### Comparison of GCC and non-GCC States

One peculiar characteristic of the Western Asia region is that it can be divided into two distinct subsets of countries - the GCC States with high income per capita and the rest with middle to low per capita income. The six GCC members are oil exporters-Bahrain, Kuwait, Oman, Qatar and Saudi Arabia. (The United Arab Emirates, a GCC member, did not participate in the program.) The rest are agro-industrial or service oriented economies and most are oil importers. They are Egypt, Iraq, Jordan, Lebanon, the Syrian Arab Republic and Yemen.

The standards of living, consumption patterns and price structures of the two sets of countries are vastly different and comparison of countries in each group separately is of interest to data users. The GCC countries may find it interesting to see the results of a comparison confined to GCC members only. For example, the comparison between Kuwait and Oman will be different from that in

The results confirm that the choice of Jordan and Oman as ring countries representing the region was a good decision. Interestingly, Jordan's average similarity coefficient with respect to GCC countries (0.69) is virtually the same as its average similarity index with respect to its non-GCC counterparts (0.68). Oman's similarity index of 0.63 with the non-GCC countries as a group is the highest for a GCC country.

the entire Western Asia regional comparison. That is because the comparisons are multilateral, in which the number and composition of countries will have an effect, however small, on the results of the comparison of any two countries. In general, the EKS method minimizes the deviations of the bilateral PPPs from the multilateral PPPs. Nevertheless, the addition of a country to a region or to a regional group changes the PPPs for all countries because of the additional binaries that would enter in the EKS PPP calculation.<sup>2</sup>

The change would be more pronounced if the new country entering the comparison shows significant difference in its price and expenditure structure compared to the average price and expenditure structure for the group. In that sense, the relationship between Kuwait and Oman would be affected more if, for example, Yemen was added in the GCC comparison than if the United Arab Emirates was added.

In each group a base country was chosen - Oman for GCC and Jordan for non-GCC countries. Expenditure weights, prices and exchange rates, and hence the nominal values were the same as in the whole group. The results of the two sets of comparisons are presented separately for GDP and actual final household consumption. Table 12 presents PLI and GDP estimates for the regional comparison for 11 countries as well as for the GCC comparison covering five GCC countries. The results from the non-GCC comparison are shown in table 13. The two tables show that the

<sup>2</sup> The EKS method is multilateral and calculates the parity between two countries as the geometric mean of all the direct and indirect bilateral comparison between them. Take, for example, four countries A, B, C and D. The direct binaries obtained from direct bilateral comparison between A and B represent the geometric mean of price ratios between the two countries (A/B). The indirect binaries between A and B are driven indirectly through the comparison of A with C and B with C (A/C\*C/B) and through a fourth country D (A/D\*D/B). EKS counts the direct binaries twice and each indirect binary once (see Annex II for a detailed presentation.)

Country	All countries in one group		Gulf countries separately	
	PLI	GDP	PLI	GDP
Country	Oman = 1.00	Oman = 1.00	Oman = 1.00	Oman = 1.00
Qatar	1.25	3.38	1.20	3.53
Kuwait	1.21	2.21	1.17	2.29
Bahrain	1.09	1.34	1.07	1.37
Saudi Arabia	1.06	1.04	1.06	1.05
Oman	1.00	1.00	1.00	1.00

Country	All countries in one group		Non-Gulf countries separately	
	PLI	GDP	PLI	GDP
Country	Jordan = 1.00	Jordan = 1.00	Jordan = 1.00	Jordan = 1.00
Lebanon	1.05	2.38	1.07	2.34
Egypt	0.55	1.11	0.49	1.25
Jordan	1.00	1.00	1.00	1.00
Syria	0.71	0.95	0.64	1.04
Iraq	0.71	0.75	0.64	0.82
Yemen	0.68	0.53	0.61	0.59

ranking of countries has not been altered neither in terms of GDP values nor in terms of PLI (except in one case in which Jordan and the Syrian Arab Republic switch places.)

Table 12 shows that the PLI for Qatar (1.25), Kuwait (1.21) and Bahrain (1.09) in the regional comparison are higher than their corresponding estimates in the GCC comparison, 1.20, 1.17, and 1.07, respectively. The corresponding GDP of Qatar, Kuwait, and Bahrain with respect to Oman are slightly higher in the GCC comparison than in the regional comparison. In the regional comparison, Qatar's GDP

is 3.38 times that of Oman. The corresponding figure in the GCC comparison is 3.53. The relationship between Saudi Arabia and Oman remains the same in both scenarios.

In general, the changes are more pronounced for non-GCC countries. Egypt's PLI went from 0.55 to 0.49. Yemen went from 0.68 to 0.61. An important point to note is that the effect of an 'outlier' country will have a larger effect the smaller the group of countries. For example, Lebanon in table 13 has more effect on countries such as Egypt and Yemen when fewer countries are in the comparison than when all coun-

## 2.3 COUNTRY PROFILE

### Bahrain

**Gross domestic product (GDP):** Bahrain is the smallest economy in the region accounting for 1.52 per cent of the region's total GDP measured in PPP terms. However, it becomes the 2nd smallest economy in the region accounting for 1.93 per cent of the region's total GDP when measured in exchange rate terms. Its price level of 127, which is 27 per cent higher than the regional average explains the observed drop from 1.93 to 1.52 when considering PPP-adjusted GDP.

**GDP per capita:** Bahrain has the 3rd highest GDP per capita in the region measured in both PPP and exchange rate terms.

**Actual final household expenditure:** Bahrain accounts for 1.37 per cent and 2.09 per cent of the total actual final household expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 153 per cent of the regional average.

**Collective consumption expenditure by government:** Bahrain accounts for 0.76 per cent and 1.14 per cent of the total collective government expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 150 per cent of the regional average.

**Gross fixed capital formation:** Bahrain accounts for 1.83 per cent and 1.91 per cent of the total gross fixed capital formation of the region measured in PPP and exchange rate terms, respectively, with price level of 104 per cent of the regional average.

#### Some highlights:

Bahrain has the highest real per capita GDP in the following categories in the region:

- Clothing and footwear
- Health by household
- Net purchases from abroad

### Egypt

**Gross domestic product (GDP):** Egypt is the 2nd largest economy in the region accounting for 25.04 per cent of the region's total GDP measured in PPP terms and 14.23 per cent in exchange rate terms. Its price level of 57, which is 43 per cent lower than the regional average explains the observed increase from 14.23 to 25.04 when considering PPP-adjusted GDP.

**GDP per capita:** Egypt has the 7th highest GDP per capita measured in PPP and the 9th highest measured in exchange rate terms.

**Actual final household expenditure:** Egypt accounts for 37.78 per cent and 22.68 per cent of the total actual final household expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 60 per cent of the regional average.

**Collective consumption expenditure by government:** Egypt accounts for 20.06 per cent and 9.26 per cent of the total collective government expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 46 per cent of the regional average.

**Gross fixed capital formation:** Egypt accounts for 17.48 per cent and 13.38 per cent of the total gross fixed capital formation of the region measured in PPP and exchange rate terms, respectively, with price level of 77 per cent of the regional average.

### Iraq

**Gross domestic product (GDP):** Iraq is the 4th largest economy in the region accounting for 6.7 per cent of the region's total GDP measured in PPP terms. However, it becomes the 5th largest economy accounting for 4.89 per cent of the region's total GDP measured in exchange rate terms. Its price level of 73, which is 27 per cent lower than the regional average explains the observed increase from 4.89 to 6.7 when considering PPP-adjusted GDP.

**GDP per capita:** Iraq has the 2nd lowest GDP per capita measured in both PPP and exchange rate terms.

**Actual final household expenditure:** Iraq accounts for 7.69 per cent and 5.70 per cent of the total actual final household expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 74 per cent of the regional average.

**Collective consumption expenditure by government:** Iraq accounts for 19.75 per cent and 12.20 per cent of the total collective government expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 62 per cent of the regional average.

**Gross fixed capital formation:** Iraq accounts for 2.75 per cent and 2.60 per cent of the total gross fixed capital formation of the region measured in PPP and exchange rate terms, respectively, with price level of 94 per cent of the regional average.

#### Some highlights:

Iraq has the lowest real per capita GDP in the following categories:

- Construction
- Education by household
- Restaurants and hotels
- Recreation and culture
- Housing, water, electricity, gas and other fuels
- Cloth and footwear

### Jordan

**Gross domestic product (GDP):** Jordan is the 2<sup>nd</sup> smallest economy in the region accounting for 1.76 per cent of the region's total GDP measured in PPP terms. However, it appears to be the smallest economy accounting for 1.82 per cent of the region's total GDP measured in exchange rate terms. Its price level of 103, which is 3 per cent higher than the regional average explains the observed drop from 1.82 to 1.76 when considering PPP-adjusted GDP.

**GDP per capita:** Jordan has the 8th highest GDP per capita measured in PPP and the 7th highest GDP per capita measured in exchange rate terms.

**Actual final household expenditure:** Jordan accounts for 3.07 per cent and 3.66 per cent of the total actual final household expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 119 per cent of the regional average.

**Collective consumption expenditure by government:** Jordan accounts for 2.03 per cent and 1.59 per cent of the total collective government expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 78 per cent of the regional average.

**Gross fixed capital formation:** Jordan accounts for 3.06 per cent and 3.10 per cent of the total gross fixed capital formation of the region measured in PPP and exchange rate terms, with price level of 101 per cent of the regional average.

### Kuwait

**Gross domestic product (GDP):** Kuwait is the 3rd largest economy in the region accounting for 8.27 per cent of the region's total GDP measured in PPP terms and 11.63 per cent in exchange rate terms. Its price level of 141, which is 41 per cent higher than the regional average explains the observed drop from 11.63 to 8.27 when considering PPP-adjusted GDP.

**GDP per capita:** Kuwait has the 2nd highest GDP per capita measured in both PPP and exchange rate terms.

**Actual final household expenditure:** Kuwait accounts for 5.12 per cent and 9.17 per cent of the total actual final household expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 179 per cent of the regional average.

**Collective consumption expenditure by government:** Kuwait accounts for 5.76 per cent and 10.39 per cent of the total collective government expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 180 per cent of the regional average.

**Gross fixed capital formation:** Kuwait accounts for 8.58 per cent and 9.50 per cent of the total gross fixed capital formation of the region measured in PPP and exchange rate terms, respectively, with price level of 111 per cent of the regional average.

#### Some highlights:

Kuwait has the highest real per capita GDP in the following categories:

- Furnishing, household equipment and routine household maintenance
- Recreation and culture
- Housing, water, electricity, gas and other fuels
- Food and non-alcoholic beverages
- Restaurants and hotels

### Lebanon

**Gross domestic product (GDP):** Lebanon is the 9th largest economy in the region accounting for 2.87 per cent of the region's total GDP measured in PPP terms. However, it becomes the 8th largest economy accounting for 3.1 per cent in exchange rate terms. Its price level of 108, which is 8 per cent higher than the regional average explains the observed drop from 3.1 to 2.87 when considering PPP-adjusted GDP.

**GDP per capita:** Lebanon has the 6th highest GDP per capita measured in both PPP and exchange rate terms.

**Actual final household expenditure:** Lebanon accounts for 4.52 per cent and 5.83 per cent of the total actual final household expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 129 per cent of the regional average.

**Collective consumption expenditure by government:** Lebanon accounts for 2.95 per cent and 2.69 per cent of the total collective government expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 91 per cent of the regional average.

**Gross fixed capital formation:** Lebanon accounts for 4.11 per cent and 3.80 per cent of the total gross fixed capital formation of the region measured in PPP and exchange rate terms, respectively, with price level of 92 per cent of the regional average.

#### Some highlights:

Lebanon has the highest real per capita GDP in the following categories:

- Education by household
- Tobacco

Lebanon has the lowest real per capita GDP in net purchases from abroad in the region.

### Oman

**Gross domestic product (GDP):** Oman is the 7th largest economy in the region accounting for 3.82 per cent of the region's total GDP measured in PPP terms. However, it becomes the 6th largest economy accounting for 4.44 per cent in exchange rate terms. Its price level of 116, which is 16 per cent higher than the regional average explains the observed drop from 4.44 to 3.82 when considering PPP-adjusted GDP.

**GDP per capita:** Oman has the 5th highest GDP per capita measured in both PPP and exchange rate terms.

**Actual final household expenditure:** Oman accounts for 2.74 per cent and 3.74 per cent of the total actual final household expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 137 per cent of the regional average.

**Collective consumption expenditure by government:** Oman accounts for 4.72 per cent and 5.62 per cent of the total collective government expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 119 per cent of the regional average.

**Gross fixed capital formation:** Oman accounts for 4.39 per cent and 4.47 per cent of the total gross fixed capital formation of the region measured in PPP and exchange rate terms, respectively, with price level of 102 per cent of the regional average.

#### Some highlights:

Oman has the highest real per capita GDP in miscellaneous goods and services in the region.

### **Qatar**

**Gross domestic product (GDP):** Qatar is the 6th largest economy in the region accounting for 4.18 per cent of the region's total GDP measured in PPP terms. However, it becomes the 4th largest economy accounting for 6.06 per cent in exchange rate terms. Its price level of 145, which is 45 per cent higher than the regional average explains the observed drop from 6.06 to 4.18 when considering PPP-adjusted GDP.

**GDP per capita:** Qatar has the highest GDP per capita measured in both PPP and exchange rate terms.

**Actual final household expenditure:** Qatar accounts for 1.51 per cent and 2.75 per cent of the total actual final household expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 182 per cent of the regional average.

**Collective consumption expenditure by government:** Qatar accounts for 2.59 per cent and 4.11 per cent of the total collective government expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 159 per cent of the regional average.

**Gross fixed capital formation:** Qatar accounts for 8.68 per cent and 11.38 per cent of the total gross fixed capital formation of the region measured in PPP and exchange rate terms, respectively, with price level of 131 per cent of the regional average.

#### **Some highlights:**

Qatar has the highest real per capita GDP in the following categories:

- Machinery and equipment
- Changes in inventories and acquisitions less disposals of valuables
- Transport
- Communication

### **Saudi Arabia**

**Gross domestic product (GDP):** Saudi Arabia is the largest economy in the region accounting for 36.75 per cent of the region's total GDP measured in PPP terms and 45.4 per cent in exchange rate terms. Its price level of 124, which is 24 per cent higher than the regional average explains the observed drop from 45.4 to 36.75 when considering PPP-adjusted GDP.

**GDP per capita:** Saudi Arabia has the 4th highest GDP per capita measured in both PPP and exchange rate terms.

**Actual final household expenditure:** Saudi Arabia accounts for 23.8 per cent and 34.65 per cent of the total actual final household expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 146 per cent of the regional average.

**Collective consumption expenditure by government:** Saudi Arabia accounts for 33.5 per cent and 48.96 per cent of the total collective government expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 146 per cent of the regional average.

**Gross fixed capital formation:** Saudi Arabia accounts for 39.23 per cent and 41.91 per cent of the total gross fixed capital formation of the region measured in PPP and exchange rate terms, respectively, with price level of 107 per cent of the regional average.

#### **Some highlights:**

Saudi Arabia has the highest real per capita GDP in the following categories:

- Food and non-alcoholic beverages
- Transport
- Communication

### The Syrian Arab Republic

**Gross domestic product (GDP):** Syria is the 5th largest economy in the region accounting for 5.62 per cent of the region's total GDP measured in PPP terms. However, it becomes the 7th largest accounting for 4.09 per cent in exchange rate terms. Its price level of 73, which is 27 per cent lower than the regional average explains the observed increase from 4.09 to 5.62 when considering PPP-adjusted GDP.

**GDP per capita:** Syria has the 9th highest GDP per capita measured in PPP and has the 8th highest GDP per capita measured in exchange rate terms.

**Actual final household expenditure:** Syria accounts for 8.03 per cent and 6.28 per cent of the total actual final household expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 78 per cent of the regional average.

**Collective consumption expenditure by government:** Syria accounts for 4.4 per cent and 2.40 per cent of the total collective government expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 54 per cent of the regional average.

**Gross fixed capital formation:** Syria accounts for 6.26 per cent and 5.40 per cent of the total gross fixed capital formation of the region measured in PPP and exchange rate terms, respectively, with price level of 86 per cent of the regional average.

#### Some highlights:

Syria has the lowest real per capita GDP in the following categories:

- Tobacco
- Changes in inventories and acquisitions less disposals of valuables
- Miscellaneous goods and services

### Yemen

**Gross domestic product (GDP):** Yemen is the 8th largest economy in the region accounting for 3.46 per cent of the region's total GDP measured in PPP terms. However, it becomes the 9th largest economy accounting for 2.41 per cent in exchange rate terms. Its price level of 70, which is 30 per cent lower than the regional average explains the observed increase from 2.41 to 3.46 when considering PPP-adjusted GDP.

**GDP per capita:** Yemen has the lowest GDP per capita measured in both PPP and exchange rate terms.

**Actual final household expenditure:** Yemen accounts for 4.37 per cent and 3.44 per cent of the total actual final household expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 70 per cent of the regional average.

**Collective consumption expenditure by government:** Yemen accounts for 3.49 per cent and 1.65 per cent of the total collective government expenditure of the region measured in PPP and exchange rate terms, respectively, with price level of 47 per cent of the regional average.

**Gross fixed capital formation:** Yemen accounts for 3.63 per cent and 2.56 per cent of the total gross fixed capital formation of the region measured in PPP and exchange rate terms, respectively, with price level of 71 per cent of the regional average.

#### Some highlights:

Yemen has the lowest real per capita GDP in the following categories:

- Communication
- Machinery and equipment
- Transport
- Health by household
- Furnishing, household equipment and routine household maintenance
- Health and education by government





### 3.1 FRAMEWORK OF COMPARISON

In principle, GDP estimates can be compiled from income, expenditure or production frontiers. The ICP approach consists of comparing volume of outputs (real values of GDP and its main components) by means of expenditure estimates and price level comparisons. That is dictated more by operational feasibility than by anything else. The production-side approach is also operationally possible, albeit more difficult than the expenditure approach; it divides GDP by industrial origin measured by value-added produced by agriculture, mining, manufacturing and services, and their sub-components. From policy-making and analysis perspectives, PPPs by industry of origin provide valuable insight into productivity and growth analysis and are in high demand. However, producing PPPs by industrial category is a difficult undertaking owing to differences in production methods and patterns, which are generally significantly higher than observed differences in expenditure patterns. Moreover, the production side approach demands price information both for the final product and its intermediate inputs, requiring double deflation. As a result, since its inception, the ICP has focused on the expenditure-side approach.

Simply put, the ICP calculates PPPs as weighted averages of inter-country price ratios. Thus, computation of PPPs requires two sets of data for all participating countries in the region: (1) national annual average prices of items selected for each of the 155 basic headings; and (2) final expenditure on

GDP for the basic headings.

The GDP in ICP is divided into 26 categories, which are further split into 61 groups, 126 classes and 155 basic expenditure headings (see table 14). The categories, groups and classes provide a coherent framework for data organization and presentation. The framework provides consistent definitions and classifications relating to a general conceptual understanding of how different activities occurring in various parts of the economy are inter-connected. As such, they help tailor policy-making according to different needs and purposes. A basic heading (BH) consists of a group of homogenous and well-defined goods or services for which a sample of products can be selected that are both representative of their type and of the volume of purchases made in participating countries and are comparable between the countries.

From a national accounts compilation perspective, a BH represents the smallest GDP aggregate for which expenditure data are available. BH expenditures are used as weights in the calculation of aggregated PPPs in order to reflect expenditure patterns of the participating countries. If no BH breakdowns were applied and the PPPs of an analytical category or group were compiled as an unweighted average of purchasing power ratios, the resulting PPP would be less accurate. For example, the dispersion of price ratios within “beef and veal” BH is expected to be smaller than within the broad “meat” category, which includes other BHs such as “lamb, mutton



and goat” and “poultry,” among others. In some countries, beef and veal are more popular while mutton or poultry may be preferred in others. Given price differences in beef, poultry and lamb, neglecting the weight at the BH level will yield less accurate PPPs.

Many countries had difficulties in estimating expenditure weights for all 155 basic headings and the estimated weights were not always accurate. However, even limited accuracy at the BH level can be useful because the use of approximate weights is even better than using no weights at all. The potential errors associated with BH weights will usually “wash out” at higher aggregation level and hence will have only limited effect on the published results which, on the whole, will benefit from the more detailed classifications.

### 3.2 HOW PRODUCTS WERE SELECTED

*Principles of product selection:* One of the most important factors bearing on the quality of the PPP data is the selection of goods and services to be priced. For each category, say household consumption, there are groups such as food, clothing, housing, furniture, etc. Within each group, say food, there are further breakdowns such as fruits and vegetables, which are further split into finer BH expenditures.

Rice, beef and veal, butter and margarine are examples of BHs under food. Going further into the detailed specifications, it becomes clearer that, although countries will have many overlapping categories and items, they will also have country-specific categories and items. In order to obtain comparisons for goods that are not consumed in all countries, countries participating in the ICP must agree to a common set of expenditure headings and a set of overlapping commodities within each heading that reflects those expenditures.

The selection of products is governed by two sometimes conflicting criteria: comparability and representa-

Table 14. Number of categories, groups, classes, basic headings and products by main aggregates

Main aggregates categories	Categories	Groups	Classes	Basic Headings	West Asia Products
<b>11.00 Individual consumption expenditure by households</b>	<b>13</b>	<b>43</b>	<b>90</b>	<b>110</b>	<b>862</b>
- .01 Food and non-alcoholic beverages!		2	11	29	353
- .02 Alcoholic beverages, tobacco and narcotics		3	5	5	21
- .03 Clothing and footwear		2	5	5	162
- .04 Housing, water, electricity, gas and other fuels		4	7	7	12
- .05 Furnishings, household equipment and maintenance		6	12	13	83
- .06 Health		3	7	7	68
- .07 Transport		3	13	13	29
- .08 Communication		3	3	3	12
- .09 Recreation and culture		6	13	13	59
- .10 Education		1	1	1	11
- .11 Restaurants and hotels		2	2	2	20
- .12 Miscellaneous goods and services		7	10	10	30
- .13 Net purchases abroad		1	1	2	2
<b>12.00 Individual consumption expenditure by NPISHs</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>13.00 Individual consumption expenditure by government</b>	<b>5</b>	<b>7</b>	<b>16</b>	<b>21</b>	<b>25</b>
- .01 Housing		1	1	1	1
- .02 Health		2	7	12	13
- .03 Recreation and culture		1	1	1	5
- .04 Education		2	6	6	5
- .05 Social protection		1	1	1	1
<b>14.00 Collective consumption expenditure by government</b>	<b>1</b>	<b>1</b>	<b>5</b>	<b>5</b>	<b>32</b>
<b>15.00 Gross fixed capital formation</b>	<b>3</b>	<b>6</b>	<b>11</b>	<b>12</b>	<b>142</b>
- .01 Machinery and equipment		2	7	8	99
- .02 Construction		3	3	3	34
- .03 Other products		1	1	1	9
<b>16.00 Change in inventories &amp; acquisitions</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>4</b>
- .01 Change of inventories		1	1	2	2
- .02 Acquisitions less disposals of valuables		1	1	2	2
<b>18.00 Balance of exports and imports</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>
<b>GDP</b>	<b>26</b>	<b>61</b>	<b>126</b>	<b>155</b>	<b>1068</b>

tivity. In order to avoid comparing products of different quality, size and delivery conditions, the products included in the list should be as comparable as possible. Comparing identical items means that there should be no differences in either the quantity or quality of the specifications selected among countries, which significantly influence the use of the given good or service. It would not be appropriate, for instance, to observe the price of rice in 1 kg package in one country while observing it in a 10 kg package (and dividing it by 10) in another country.

Moreover, the physical and functional properties of a product should be the same (e.g., the make and model, as well as the capacity, power and functionality). That relates to all such properties that may have significant influence on the price of a given product. To the extent possible, types of outlet and service delivery should also be the same when matching items across countries. Similarly, delivery conditions need to be consistent, including packaging, return policy, warranty and transportation cost.

Representativity means the product should be typical of the consumption pattern of countries under investigation. It has expenditure and price dimensions. From an expenditure perspective, if a product is representative, it accounts for a noticeable share of overall expenditure on the BH for which it is chosen and is widely available in retail outlets. From a price perspective, representativity means that the average price of the product reflects the average price level for most products within the BH. In short, to be representative, the product must account for a noticeable share of expenditure on the BH, and also represent the average price level for most of the products in the BH. Unfortunately, what are comparable across countries are not always representative and *vice versa*. The ICP requires striking a delicate balance between comparability and representativity.

*Product selection in practice:* ICP 2005 used a version of the Eurostat-OECD Expenditure Classification, which contains 155 basic headings (see table 14). Selection of products to represent the BH for household consumption expenditure was done in close consultation with experts at the national statistical offices of the participating countries. The products to be priced for government consumption expenditure and GFCF were selected by ICP Global Office and all countries in all regions were required to price a standard set of goods and services for those expenditure components.

The classification of individual items into BHs is governed by the objective of drawing homogenous products and minimize the dispersion of individual price ratios within BHs. That is defined as the lowest breakdown of GDP for which reasonably robust expenditure weight can be compiled. A typical BH is rice. Under that heading, nine varieties of rice were included for price collection in the Western Asia region. In comparison, in the Asia-Pacific region where rice is a main staple in most countries, the rice BH contains 12 varieties of rice.

### 3.3 STRUCTURED PRODUCT DESCRIPTION (SPD)

The lack of region-specific list of products based on the market realities of the respective regions was one of the main problems of the past ICP. That happened because the list established for ongoing Eurostat-OECD Comparison Program was modified to serve other regions. The Structured Product Description (SPD) approach was introduced in the 2005 ICP round to facilitate the creation of region-specific lists of products. The SPD approach provides a general framework based on an array of price-determining characteristics, such as package type, model, variety, size, outlet, etc. The objective is to clarify, simplify and standardize the process. The SPDs were used to derive a set of product

The selection of products is governed by two sometimes conflicting criteria: comparability and representativity.

.....

Comparability: in order to avoid comparing products of different quality, size and delivery conditions, the products included in the list should be as comparable as possible. The physical and functional properties of a product should be the same.

.....

Representativity means the product should be typical of the consumption pattern of countries under investigation. It has expenditure and price dimensions. From an expenditure perspective, if a product is representative, it accounts for a noticeable share of overall expenditure on the BH for which it is chosen and is widely available in retail outlets. From a price perspective, representativity means that the average price of the product reflects the average price level for most products within the BH.

**Basic Heading: Maintenance and repair of the dwelling****Product Name:** Paint, indoor use - ready-to-use**Product Description**

- Preferred Pricing Quantity: 5 Liters
- Range: 5 - 10 Liters
- Package: Plastic container or tin
- Type: Ready-to-use indoor washable emulsion
- Colour: White, mat finish
- Fertility: Approximately 7 m<sup>2</sup>/l
- Brand: Locally well known brand
- Comments: No water to be added

specifications specific to each region based on market surveys in a selected number of representative countries. A compendium of product specifications along with corresponding pictures was prepared and distributed to the participating countries. Examples of product specifications are shown on the left.

**3.4 HOW THE PRICE SURVEY FRAMES WERE ESTABLISHED**

The Western Asia region is composed of countries with diverse characteristics. There are both large and small countries, very rich and relatively poor, oil-producers and non-oil producers. In addition, in many cases their populations comprise both local as well as significant numbers of migrant workers. When the population features are superimposed on those physical features, it becomes complex to determine, unambiguously, the optimum sampling procedure for selecting the outlets most frequented by shoppers, identifying the products in the ICP list, and choosing the most popular, the prices of which should be collected.

In principle, the item prices should be collected in many markets and outlets stratified by regions, and rural and urban areas over a span of a year to obtain national annual averages. In practice, however, not all countries in all regions find that possible. In some cases, cost considerations limit price collection to capital cities and/or other major cities. In such cases, adjustment factors from national CPI and other price indices are utilized to adjust for regional and seasonal variations.

It is neither feasible nor necessary to price all products available in different markets. For practical and resource purposes, only a relatively small number of them are selected for which prices are to be collected. The number of selected products covering GDP may vary from 1000 to well over 5000, depending on the level of economic development and the diversification of the markets of the

**Basic Heading: Fresh or chilled fruit****Product Name:** Strawberry**Product Description**

- Preferred Pricing Quantity: 1 Kilograms
- Packaging: Bulk or Loose
- Type: Strawberries
- Quality: Premium
- Processing: Fresh whole, intact

**Basic Heading: Audio-visual, photographic and information processing****Product Name:** Scanner, Flatbed**Product Description**

- Brand: Canon or equivalent brands such as HP, Epson, Canon, Sony, Brother
- Model: Mid-level model, e.g. Canon LiDE 60
- Type: Flatbed scanner
- Optical Resolution: 1200 x 2400 dpi or Other
- Bit Depth: 48 bit or Other
- Maximum Scanning Size: A4 or 8.5 in x 11.7 in
- USB Interface: Yes
- Power Supply: Via USB
- Exclude: Film adapter unit
- Comments: Specify brand, model and all technical specifications on the corresponding SPD form



participating countries. For Western Asia, the number was 1068 for the current comparison. As reflected in table 14, that includes 862 items under household consumption, 57 under government outlays and 142 for capital formation covering both machinery and equipment as well as construction projects.

Countries were required to price a minimum number of products in each of the BH classifications. The minimum depends on the importance and heterogeneity of each BH. For example, more products are priced under bread than under tobacco. Furthermore, the higher the dispersion of prices around the average, the greater the number of products to be priced. Some products such as postage stamps and gasoline have regulated prices, and in that case fewer observations are needed to obtain robust average. The greater the dispersion of prices around the average, for example clothing, the greater the number of observations and outlets to be covered.

### 3.5 COMPILING EXPENDITURE WEIGHTS

PPPs are first computed for the basic headings and then aggregated using expenditure weights. Therefore, in addition to price data, the computation of aggregated PPPs requires national GDP expenditures broken down into 155 expenditure basic headings. The GDP expenditure weights reflect national preferences showing how a nation chooses to spend its resources. The ultimate objective of the ICP is to show the levels of GDP and related aggregates converted into a common currency using PPPs, which means that the weights should reflect the expenditure patterns of each country as accurately as possible. In addition, the estimated levels of GDP in national currencies must also be accurately estimated. If the levels are wrong, the comparisons of PPP-converted GDP and related aggregates will also be wrong and the whole purpose of the ICP will be undermined.

The responsibility for providing the expenditure estimates according to the

desired classification lies with each country's national statistical office. All Western Asia countries estimate their national accounts according to the 1993 SNA. More specific guidance on estimating the expenditure weights is provided in Chapter III of the ICP Handbook.

The national accounts weights for most countries are reasonably accurate at the higher levels of aggregation at which they are usually published. However, the ICP requires a much more detailed breakdown than the one which is normally compiled by national statistical organizations. The accuracy and comprehensiveness of the national accounts data also varies between countries. In almost all countries, BH expenditure weights had to be estimated using secondary sources. Some measure of approximations and imputations could not be avoided at the more detailed levels. As a result, comparisons of results at lower aggregate levels are not as robust as they are for higher-level aggregates.

The requirement that expenditure data should be available for each BH needs not be interpreted very strictly. Even in countries with very developed statistics, it cannot be expected that expenditure data for all BHs will be observed or collected on a regular basis and based on a primary source of data. Estimates based on some benchmark information can be used. The expenditure data for BHs are used as weights, and even limited accuracy can be useful since the use of estimated weights is better than using no weights at all. If some errors are committed by separating particular BHs from each other, they will not directly affect the published results that cover only the analytical categories. Of course, the better the estimations of the detailed weights, the more accurate the end results will be. But countries should not be discouraged from making approximate estimations. The potential deviations committed will have, in most cases, limited effect on the PPP results published.

PPPs are first computed for the basic headings and then aggregated using expenditure weights. Therefore, in addition to price data, the computation of aggregated PPPs requires national GDP expenditures broken down into 155 expenditure basic headings. The GDP expenditure weights reflect national preferences showing how a nation chooses to spend its resources.

The challenge of compiling BH national accounts data in some countries was seen more as an opportunity to improve the data rather than an impediment. Country experts worked together to ensure that international standards and practices were followed. A number of regional workshops were organized and conducted by international experts aimed at sharing experiences and best practices.

### 3.6 DATA VALIDATION

An important feature of the 2005 round of ICP surveys has been the thoroughness with which data were reviewed and authenticated. The process was aided by new computer tools and firm commitments to data quality by national, regional and global coordinators. Increased resources to fund meetings and travel also helped. Data were collected using the price collection module (PCM) of the ICP Tool Pack, an integrated software developed for data collection, editing and processing. That put data collection by all Western Asia countries on a common platform and enabled easy exchange of data and improved communication between national and regional coordinators.

Before the data were transmitted to UN-ESCWA, they had gone through an extensive process of editing and validation. That is an iterative process – the countries do the preliminary checking, then UN-ESCWA conducts further edits and validation using the data processing module (DPM) and refers questionable entries back to countries for correction or confirmation. It was necessary to repeat the process a number of times.

Although edits are done throughout the data processing cycle, there are two different editing steps that are taken before attempting to compute BH level parities: (i) establish internal consistency of the data within the country, and (ii) establish consistency across coun-

tries. Establishing internal consistency involves ensuring that the price of an item bears an acceptable relationship with the prices of other items. For instance, a bottle of beer served in a restaurant should cost more than a bottle of the same beer bought in a grocery store; hourly wage rates of plumbers and electricians should be broadly similar; or the price of the same item should not differ too much from one market to another without proper justification, and so on.

Preliminary checks for internal consistency are done at the country level. They consist of checking, among other things, that (i) prices match specifications; (ii) when substitutes are priced, they are closely described; (iii) the number of observations per item is adequate; (iv) obvious outliers are eliminated; (v) units are correctly reported, such as kilograms not pounds, or single units rather than dozens; or (vi) the unit of observation is close to the reference unit.

As a regional coordinator, UN-ESCWA performed additional checks for regional consistency. That was checked initially by comparing the “dollar” prices – that is comparing the prices after they have been converted to a reference currency by exchange rates. Again, outliers are spotted by adopting several measures of dispersion. The process has been formalized in the DPM of the ICP software, in the form of “Quaranta tables” and “Dikhanov tables”. The Quaranta tables look at the data product-by-product and identify prices that seem to be out of line from the regional average at the BH level. The Dikhanov tables look at all the data – across countries as well as over all BHs within a country – and provide color-coded information on degrees of dispersion from the central tendency. The findings are communicated to national coordinators for further checking.

Similar diagnostic tables were produced for checking and authenticating national accounts data. The problem

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areas identified by the tables were discussed in round table meetings. Several such meetings were held before the participating countries could sign off on the data. Despite all the efforts, PPP estimates for some countries looked counter-intuitive in some areas. When no obvious data errors were spotted, international experts were dispatched to the problem countries to make sure that they paid proper attention to matching quality. As a result of the visits, some prices were confirmed, others were revised and yet others were dropped from the country list.

It can be said with a great deal of confidence that the data collected and reported in that exercise are as good as they can be, given the circumstances prevailing in the participating countries.

### 3.7 THE PPP CALCULATION IN OUTLINE

Regional PPPs are computed in two stages:

1. For BHs, individual item price ratios are averaged without using weights.
2. For higher levels of aggregation up to GDP, the BH - PPPs computed in stage 1 are averaged using BH expenditure weights.

In a later stage, all regional results are linked to produce a globally consistent set of PPPs and volume measures. The linking method using ring countries is described in section 3.8.

Consider two countries— Saudi Arabia, as a base country, whose currency is the Saudi rial, and Egypt, whose currency is the Egyptian pound, and a BH, rice. The standard method of computing a BH - PPP involves the following steps. The first is computing price ratios (price parities) for the various types of rice included within the BH “rice”. The price of each type of rice submitted by Egypt is divided by the price submitted for the same rice product by Saudi Arabia, the base country. The second step is computing the geometric mean of the price

ratios of Egypt to that of Saudi Arabia (expressed as pound/rial). The resulting ratio is the PPP of rice in Egypt relative to that in Saudi Arabia.

Now consider the next aggregation level - food - which includes other headings such as bread, meat, fish, dairy products, vegetables, among others, in addition to rice. The aggregate PPP for food is obtained as an average of the price parities within the food heading, weighted by their relative importance in each country. Similarly, the PPP for total GDP is a weighted average of all the price parities. Volume comparisons of GDP can then be obtained by dividing GDP in local currency units by the PPP.

Since ICP compares a number of countries in a region, the PPPs should have two essential characteristics: transitivity and base country-invariance. Transitivity requires that a direct comparison between any pair of countries (e.g., Saudi Arabia and Egypt) should be equal to an indirect comparison via any third country (e.g., Egypt and Lebanon, and Saudi Arabia and Lebanon). Base country-invariance means that the relative positions of countries (inter-country relations) remain the same regardless of the choice of a base country (refer to annex II for more detailed description).

### 3.8 LINKING REGIONAL RESULTS TO GLOBAL COMPARISON

The ICP is organized by regions. First, regional surveys are conducted on the basis of region-specific baskets of goods and services, and regional PPPs are computed from regional average prices. Regional PPP estimates are usually expressed in regional numeraire currencies, for example, Argentine peso for Latin America and Hong Kong dollar for Asia. Regional results are then linked to produce a globally consistent set of PPPs expressed in a common international currency, often the US dollar.

The linking of regions for the last ICP round (1993-1996) of world comparisons was done on the basis of several

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binary comparisons. For example, Japan participated both in the Asia and OECD regional comparisons and so was used as a bridge to link the results from the two regions. Mexico took part in both the OECD and Latin America comparisons and served as a bridge between the two. It is widely recognized that the linking of regional results in the last rounds had been rather weak. One of the major problems had been that the results depended on the price and expenditure structures of the country serving as a bridge.

In an effort to improve the global results, a new method, called the ring approach, was introduced for the current round of ICP. That approach involves choosing a subset of representative countries from each region to price a common product list in addition to their regional lists. The number of ring countries from each region was determined by the number of countries in the region. Africa, which has 48 countries in the regional comparison, is represented by six ring countries. South America and Western Asia, with 10 and

11 countries, respectively, in their regional comparisons, are represented by two ring countries each. Asia and Eurostat/OECD are represented by four ring countries each (see table 15). What distinguishes that approach from the previous bridge country - based linking is that it is basically multilateral. It seeks to link regions by establishing a separate list of products to be priced by a selected number of ring countries from each region. From a global perspective, ring countries serve as a small sample of countries stratified by regions.

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

\* The CIS region was linked using a bridge method. Russia that took part in the CIS and OECD comparison served as a bridge.





# 4

## DEALING WITH “COMPARISON RESISTANT” AREAS

There are special areas where direct comparisons are difficult to establish. In some cases, finding adequate comparable products is difficult (e.g., construction projects). In other cases, there are no adequate services for which market prices can be observed (e.g., health, education and other services provided by the government). There are still other special areas where quality differences across countries are so varied that it is difficult to make meaningful comparisons (e.g., housing rentals, private clinics and private education). Those and other similar areas are collectively referred to as “comparison resistant.” There is neither an easy, nor a widely accepted solution for them. In the short term, the ICP has to settle for less than ideal solutions, while concurrently making the necessary efforts to overcome the problem. Compromises are dictated by practical situations.

### 4.1 HEALTH, EDUCATION AND GOVERNMENT SERVICES

It may be recalled that total expenditures in health and education are the sums of individual consumption expenditures by households and individual expenditures by government. Some health and educational services are bought by households on a private basis and others are provided or paid (fully or partly) by the government. Thus, some prices paid by households are available in the market place and others have to be estimated as a sum

of the household and government payments (“full price” concept).

For private health and education, observed market prices are collected and used in the calculation of PPPs. Volumes are measured indirectly by dividing expenditure by the relevant prices. When such services are provided by public entities, they are often provided free of charge or at a nominal cost. Hence they are called non-market services, which, by definition, do not have market prices that can be collected and compared.

Computation of PPPs for publicly-provided services in health, education and other services presents particular problem, as it is difficult to quantify outputs. For instance, the output of a doctor cannot be measured by the number of patients treated, or of a teacher by the number of students in attendance or by the number of graduates, or of a policeman by the number of arrests made. Since outputs are not directly observable, the practice in national accounts compilation is to use input data to measure outputs. Comparison across countries, therefore, can be made only by comparing the costs of inputs.

Public expenditures in health, education and collective government services consist of compensation of employees, intermediate consumption, consumption of fixed capital, net taxes on production, gross operating surplus, and receipts from sales (as a negative figure). In the absence of any



real prices for government services, an alternative method has to be used to calculate PPPs. The method used in national accounts is to value the services at their costs of production. It is also used for the ICP.

In general, where available, private sector prices of selected items were applied as proxies or reference price for the intermediate consumption and fixed capital components of government expenditures. Some of the intermediate goods, such as drugs and hospital beds (or in the case of education, for example, textbooks and computers) may be subsidized. However, full un-subsidized prices need to be collected, otherwise subsidized prices divided into total expenditure by households and government would give inflated estimates of real quantities.

Compensation of employees is the largest component. It is in fact the only cost component for which separate price collection is needed. The process bears a close similarity to the construction of a list of products for pricing in the main list for household. Government employees of the relevant sector are matched on the basis of closely specified skill levels, including level of education, years of experience and detailed job description for the position and data on their annual compensation, all of which are collected.

The list of occupations covers health (e.g., doctor, nurse, laboratory technician, community health worker, etc.), education (e.g., primary school teacher, university lecturer, etc.), defense (e.g., army private of infantry, naval able seaman, air force ground crewman, etc.) and other (prison guard, chauffeur, civil engineer, bookkeeping clerk, database administrator, cleaner, telephone switchboard operator, office assistant, etc.). A total of 50 occupations are covered. For each occupation, wages are obtained on a standardized definition (including such items as special allowances, benefits in kind, social contributions) from

the relevant government ministries (see box 1).

Obviously, the same quantity of input does not produce the same quantity of output in every country. For example, a teacher's productivity in one country could be vastly different from that of a teacher in a different country. A teacher with better facilities, such as computer and text books available for himself/herself and to his/her students is likely to have higher productivity level as well as better quality output in terms of the quality of graduates he or she will produce. Similarly, for example, policemen in Yemen and Bahrain may perform at different levels not because they necessarily have different levels of education or years of experience, but because of differences in access to transport, communication and other equipment. Similarly, doctors may have equivalent degrees from the same university and similar experience but their effectiveness differs because of differences in access to diagnostic and patient care facilities.

Evidently, apart from the level of skill as determined by education and experience, productivity of human capital or labor, in general, depends on physical capital. Therefore, once data on compensation are collected, they need to be adjusted for productivity differences to adjust for output volume and quality differences. Labor productivity is measured by output per employee. To make productivity adjustment, Western Asia used the framework provided by the Cobb-Douglas production function in which output is expressed as a function of labor and capital. If the contribution of labor is ( $\alpha$ ) per cent, then the contribution of capital is assumed to be  $(1-\alpha)$  per cent.

Labor is estimated from employment data for age group 15 to 64. In government, the number of employees is estimated as total compensation divided by average annual compensation. Then estimates of capital per labor should be

made. That is calculated by estimating current capital stock from a stream of investments for about 25 years, appropriately discounted for depreciation. That operation would be better computed separately for health, education and government. However, for lack of information, capital per labor is measured for the entire economy. Because it is difficult to obtain estimates of capital stocks in a common currency, capital per labor is actually computed as a product of output per labor and capital to output ratio calculated on national basis. To determine the contribution of labor and capital, first the labor coefficient should be measured. It is also measured for the entire economy. Labor coefficient is measured by share of wages in GDP, which is usually higher for high-income countries and lower for low-income countries (for a detailed description, see annex III).

Output per labor in the government sector is adjusted by applying the coefficient for capital to the estimate of capital per labor estimated for the entire economy. If capital output ratios and capital labor ratios could be computed for specific sectors, the procedure would yield much better results. Future rounds of ICP will explore those possibilities.

#### 4.2 CONSTRUCTION

The objective is to calculate appropriate cross-country price indices with which to deflate expenditures on construction in the national accounts. The main problems in comparing construction projects arise from the enormous variety of projects because no two projects are exactly the same. In addition, there are many differences between countries regarding construction standards, nature of the terrain, climate conditions, labor-equipment mix in the means of construction, as well as local construction means and methods. Those differences cause problems in trying to meet the criteria of both representativity and

#### Box 1. CODE: 106 - Nurse

Nurses assist doctors in their tasks, deal with emergencies in their absence, and provide professional nursing care for the sick, injured, physically and mentally disabled, and others in need of such care, or they deliver or assist in the delivery of babies, provide antenatal and postnatal care and instruct parents in baby care.

Nurses must have qualifications that are legally recognized. In some countries it is a requirement to have a university degree in order to be able to practice as a nurse while in other countries a lower-level educational certificate is considered sufficient. In general, a nurse should have at least two years of formal training in a specialized institution.

#### Their tasks include:

Giving nursing care and treatment to ill, injured or disabled patients;

Assisting doctors in their tasks, dealing with emergencies and giving first-aid treatment in their absence;

Administering medicine and drugs, applying surgical dressings and giving other forms of treatment prescribed by physicians;

Checking on general health and progress of expectant mothers during pregnancy, and giving them professional advice and care;

Delivering babies in normal births and assisting doctors with difficult deliveries.

#### Relevant 1988 ISCO codes:

- 2230 Nursing and midwifery professionals
- 3231 Nursing associate professionals
- 3232 Midwifery associate professionals

comparability in producing the necessary PPPs. Experience has shown that it is difficult to find, for example, a typical residential building that is widely available and also comparable across countries.

Construction projects are peculiar to countries and, as such, are comparison resistant. For ICP 2005, the basket of construction components (BOCC) approach was developed to address some peculiarities in the construction sector relevant to comparison of international costs. Those peculiarities are expected to have significant impact on the assessment of completed facilities, but much less impact on the assessment of actual costs associated with several key systems and components of the facilities. The BOCC method relies on breaking construction projects into well-defined systems, which are in turn broken down into well-defined construction components. For example, residential building is divided into eight systems: site work, substructure, superstructure, exterior shell, interior partition, interior/exterior finishes, mechanical/plumbing and electrical work. The substructure system is divided into a number of components, such as aggregate base, metal window frames and column footings. The PPPs for construction are based on the costs of the components.

A construction component falls between a construction project (e.g., an apartment building or a storage facility) and a construction input (e.g., a bag of cement or a piece of reinforcing steel). The construction component can be defined as an aggregation of several construction work items, including the material actually put in place (e.g., concrete, steel or lumber), labor (e.g., masons, plumbers or carpenters) and equipment (e.g., bulldozers, cranes or dump trucks) required to construct a well-defined and quantified task.

The BOCC taxonomy of 'projects, systems and components' and the identification of clusters of materials, labor

and equipment use within the chosen components allow countries to build up uniform blocks, which can subsequently be applied in various quantities to obtain the final construction project. BOCC underlines the importance of the various components comprising different sets of labor and materials, as well as equipment use. For all of those elements, specific prices can be found and, therefore, easily combined (for more details, see annex IV).

#### 4.3 HOUSING

In the 2005 round of ICP, regions used one or a combination of two approaches to compute PPPs for housing rent. The first and preferred approach is the direct market rent approach, where rental data for comparable housing types (apartment, house and so forth) are used to compute the PPP for the dwelling BH. Though most preferred the direct market rent approach, it is rarely used outside the Eurostat/OECD comparison because of absence or weakness of required data (in some countries the rental market is very small and the data unreliable). The second approach is the "quantity method", where physical indicators on the number of units and price - determining physical characteristics and amenities of dwellings are used to produce directly comparable volume indices on dwelling. The common ICP approach is to calculate volume (real quantity) indirectly by dividing expenditure values by the corresponding PPPs. But when the quantity method is used, PPPs are obtained indirectly by dividing expenditure values by quantity (more details are provided in annex V).

#### 4.4 NET EXPORT

In ICP Western Asia 2005, export and import balances are not entered as separate headings in the GDP expenditures account but are lumped together as net exports. Since exports and imports are actual international transactions at official exchange rates, they are regarded

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as proxies for price relatives and are assigned as PPPs for net exports. That method is, however, not consistent with PPPs used for other categories of final expenditure on GDP, which are calculated using the relevant price relatives weighted by the corresponding expenditure estimates.

The assignment of exchange rates as PPPs for net exports has been a cause of concern for some countries participating in ICP-Western Asia program, that are characterized by large net exports—positive or negative. That practice can potentially give a wrong impression about some economies. The distortion in the GDP estimation stemming from the use of exchange rate for net foreign balance as a proxy for PPP depends on the dispersion between the exchange rate and the PPPs for GDP and its major components, and on the size and sign of the net foreign balance. If, for instance, net exports of a country are 20 per cent of its GDP in national currency and if its PLI for GDP is 2.0, then in real terms (PPP-converted values), its external balance will shoot up to 40 per cent of GDP; if the PLI is 0.5, then the external balance in real accounts will be slashed by 10 per cent. The average PLI for GDP will also be very different from the PLI for the rest of the economy (without net exports).

ICP experts have struggled to find separate price data for exports and imports, which figure very differently in domestic expenditure. Exchange rates are prices of currencies, not of the underlying goods and services, and when net exports are not close to zero, the use of exchange rates as prices introduces a distorting effect. Yet information on comparable items of exports and imports across national boundaries is hard to come by. Exports leave the country; they do not figure in the prices of any specific items. However, their proceeds add to the resources available for expenditure. Imports, on the other hand, add to the stock of goods and services that are domestically absorbed – some as final consumption, some as capital goods and others as intermediate items.

They all have different impact on overall prices. In an ideal world, it should be possible to account for those differences.

In the absence of the required information, the use of the overall PPP for domestic absorption (consumption, government, investment and imports) as a reference PPP for net exports has been suggested as an alternative to the use of exchange rate. However, that or any other suggestion will have to wait for the next ICP round when experts from all regions look into the matter more closely.

#### 4.5 PPPs FOR NON-BENCHMARK COUNTRIES

Several countries did not participate in ICP 2005. The primary reason was the lack of funding for collecting the national prices or compiling expenditure weights, and the costs of participating in regional and global workshops and training seminars. PPP estimates for non-benchmark countries have been estimated by regression equations using information from benchmark countries. To obtain estimates of PPP-based GDP per capita for non-benchmark countries, the World Bank uses a regression procedure linking ICP-based GDP per capita with Atlas GNI per capita and secondary school enrollment ratios.

The estimating equation takes the following form:

$$\ln(ICPY) = b_1(AtlasY) + b_2(HSER) + c$$

where

*ICPY* refers to PPP adjusted Gross Domestic Product per capita obtained within the ICP 2005 for 146 countries,

*AtlasY* stands for Atlas GNI per capita (Those estimates are converted to a common currency using exchange rates.),

*HSER* represents gross secondary school enrollment ratio, *c* is an error term.

The equation is used to predict PPP-

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based GDP for non-benchmark countries.

Secondary school enrollment ratios are used as proxies for inter-country productivity differentials for unskilled and skilled human capital. The rationale here is that *ICPY* and *AtlasY* differ mainly because of wage differentials among nations due to constraints on the international mobility of labor.

#### 4.6 PPPS FOR NON-BENCHMARK YEARS

Once the PPP estimates are obtained for a given benchmark or base year, for example 2005, the PPPs and associated PPP-adjusted GDP per capita estimates are extrapolated back and forth to generate time series. PPP-based estimate of one year is extrapolated to another year in two equivalent ways: (1) adjust base year PPP by relative rates of inflation in the country vis-à-vis the base country and use it to deflate current year national currency value to obtain current year real value, or (2) move real value of the base year to current year by constant price growth rate and apply base country inflation rate to obtain real value for the current year expressed in base currency.

Readers are advised to note that PPP-based estimates of say 1993 base year when extrapolated to 2005 will not necessarily be consistent with the estimates obtained from 2005 benchmark year. That is the main benefit and objective of running successive rounds of ICP and regularly updating PPP data, and the differences stem mainly from the following factors:

(1) The methodology of the treatment of problematic areas like housing, non-market services etc., may be different in successive ICP rounds. (In general, better methods are introduced in each successive round.)

(2) The product baskets in successive rounds of ICP may be different and ICP baskets will also be different from national baskets used in calculating national rates of inflation.

(3) The magnitude of sampling and non-sampling errors in the two surveys may be different.

(4) The two benchmark surveys may use different aggregation formulas.

(5) The number of countries participating in ICP rounds may be different. For example, if the 1993 ICP Western Asia had 11 participants (as in 2005) instead of 8, then the relationship between Jordan and Oman would be different because those are multilateral comparisons and third parties will have influence, however small, on the comparison of any two countries.

Even if the general methodologies, aggregation procedures and the group of countries in the two surveys were the same, the extrapolated values will not necessarily equal new benchmark values. That is because ICP surveys work with current year estimates so that successive benchmark estimates reflect changes from one year to another not only in quantities but also in prices. Extrapolating one benchmark year value to another by relative rates of inflation will yield changes in quantity only and will fail to capture any changes in the composition of the quantity, which may result from changes in relative prices and interplay of supply and demand of complementary and substitute products.





# 5

## BENEFITS FOR COUNTRIES PARTICIPATING IN ICP

### 5.1 INFORMING POLICY DECISIONS

From a country point of view, participating in ICP surveys produces detailed and timely data useful for policy-making. Economic policy is formulated on the basis of a performance appraisal of the economy in question. The appraisal usually involves comparing the situation of the economy in the most recent period of time with its situation in the previous period or periods. Price and volume measures are obviously needed in order to distinguish real from nominal changes and to measure rates of inflation and real growth. However, an appraisal of economic performance does not only require comparisons with past periods but also with other countries, especially neighboring or economically similar countries. Given internationally comparable product, income and expenditure data, countries will find it easier to draw on the experience of other countries to better anticipate their resource requirements and the likely change in overall demand and its composition.

Because PPP-based GDP measures volumes, it is used in comparing key ratios between countries where the numerator or denominator is also expressed in volume terms. Examples include:

- CO<sub>2</sub> emissions per unit of GDP
- Energy consumption per unit of GDP
- GDP per employee
- GDP per hour worked

Those key ratios are used by national governments as well as international organizations for analytical

purposes. For example, the Millennium Development Goals use the first two ratios in defining targets for environmental goals. Comparative statistics on GDP per worker and GDP per hour of work are of great interest to policy makers, media and general public.

Governments, media and general public like to compare their country within “regional groups”, which might be geographical – Western Asia, Latin America, Africa – or political – OPEC, ASEAN, OECD, MERCOSUR. To assess the economic size of those groups and the size of individual member countries, GDP must be converted to a common currency using PPPs.

From a national perspective, policy makers in the area of economic and financial management should ask a number of questions, the answers to which can only be found if the economic accounts were deflated with PPPs. For example, policy makers should be interested in knowing how their country’s price level compare with those it does business with. It is not sufficient to know a country’s general price level in its domestic market. It is also necessary to know the price levels for different products (food, clothing, durable goods, equipment, etc.) and the costs of government and other services (health, education, construction, transportation, etc.). Such information is critical to assess tax, subsidy and general price policies.

There are two examples of comparison that are deemed to be of great importance for national, social



**Box 2.****Lebanon: ICP & Tool Pack Offer New Vision of Data Collection\***

Dr. Maral Tutelian, *Director General, CAS, Lebanon*

The Lebanese Central Administration for Statistics (CAS) reported that ICP provided Lebanon with an opportunity to extend price collection of goods and services all over the country. This made a huge difference as the CPI price collection was limited only to the capital, Beirut, and its nearby suburbs. At the same time, the ICP also provided a platform for Lebanon to refine its method of defining specifications of goods and services in the CPI. The ICP Tool Pack software was a great help for managing data storage. It also offered options for data comparison at several levels and provided a speedy tool to manage the field work and to correct outliers.

The CAS states that the experience that Lebanon has gained from the implementation of the ICP will provide a solid background of comparable data between the Lebanese regions for the first time in the country's history. This will allow regional comparison and analysis of the socioeconomic situation and the level of poverty. The ICP is now an important tool to facilitate the smooth implementation of CPI extension covering the whole country.

In summary, the ICP and Tool Pack have offered the Lebanese CAS a new vision of organizing data collection and managing regional databases, as well as an experience in harmonizing specifications and price collection practices across regions.

\* ICP Newsletter February, 2006

and economic policies. One concerns the relationship between average prices of consumption goods compared with investment goods and what should be the normal progression of that relationship as a function of economic growth. The other concerns the free delivery of health and education services where the experience of other countries in the same region may have a beneficial effect. In either case, there are no possible meaningful comparisons in the absence of PPP-adjusted expenditures.

The ICP can give policy makers information not only on whether prices in general are really higher or lower in other countries, but also on goods and services relatively cheap or expensive in their own country compared to other countries. ICP data are thus particularly useful for assessing the comparative advantage of a country. Some countries such as India are expanding the horizon of the program by using the ICP methodology to compare cost of living differences and economic disparities across different provinces within the country.

**5.2 CAPACITY-BUILDING**

One of the stated objectives of the current ICP round surveys was to build statistical capacity at the national, regional and global levels so as to make the program sustainable. That would, consequently, enable the countries to improve quality and delivery of basic statistics in a timely manner to their national and international clients.

The tools used in the capacity-building process were:

- Handbooks and manuals containing guidance on best practices
- Computer software - ICP Tool Pack - to facilitate collecting and processing data
- Critical review and identification of weakness in national accounts statistics
- Easy access to international experts in times of need.

Judged from early indications, it seems that tremendous progress has been made toward meeting that important objective in Western Asia as well as other regions.

One of the major problems for countries in Western Asia, as in other regions, was to break down final expenditures on GDP into 155 BHs. That is a substantially more detailed breakdown than any country in the Western Asia region customarily compiles for its own national accounts. Several methods were used to obtain the 155 BH breakdowns including, in particular, the “commodity flow” method, which involves matching the supply of individual commodities from domestic production or from imports with the final uses of each item between consumption, capital formation and exports. Commodity flow is a powerful technique for ensuring consistency of the production and expenditures recorded in the national accounts and ICP 2005 can be credited with introducing that method to many participating countries.

The main objective of the ICP is to compare GDP and related aggregates across countries. For comparisons to be meaningful, it is essential that GDP estimates in local currency units are realistic and cover all economic activities included within the 1993 SNA production boundary. ICP 2005 helped focus the attention of statisticians in the participating countries on the underlying quality of their national accounts estimates. ICP 2005 provided an incentive for countries in several regions to review their estimation procedures and, where necessary, to revise their GDP estimates.

Price statistics are the main input into the ICP. Almost all countries have a CPI of some kind and so they have experience in collecting and comparing prices of consumer goods and services. The ICP requires higher standards of product comparability than are usually specified for CPIs. The SPDs developed

### Box 3.

#### ICP Experience Will Refine Egypt's CPI\*

Dr. Mohamed F. Abulata, *Senior Advisor, Central Agency for Public Mobilization and Statistics, Arab Republic of Egypt*

The Egyptian authorities confirm that the present round of ICP has given substantial attention to capacity-building in the national statistical offices in the fields of price statistics and national accounts. Egypt will build upon the experiences gained from the ICP to improve its CPI in several aspects: (1) adopting detailed SPD to ensure that the reported price is exactly related to the same product, which is priced in various data collection centers; (2) increasing numbers and types of outlets so that a better price average may be attained; (3) devising software with a built-in validation capacity (Tool Pack) in compiling CPI; and (4) upon satisfactory testing of the CPI module of the Tool Pack and on assurance from the World Bank for its continued support, Egypt would like to use the ICP Tool Pack for CPI compilation. This would be a great benefit to both the CPI and ICP as it allows greater integration of the two programs.

\* ICP Newsletter February, 2006

for ICP can be used to enhance the comparability, and hence the quality, of CPIs.

### 5.3 HANDBOOK AND MANUALS

Written by a team of international experts, the ICP Handbook provides in-depth scholarly treatment of the concepts, methods and implementation of ICP. It discusses in great detail how to compile quality price and national accounts statistics that not only constitute the main ingredients of PPP calculation but also form the backbone of national statistics. Thus, improving those statistics serves both national and ICP needs. Side by side with the Handbook, which is technical and can at times be intimidating, ICP manuals provide easy step-by-step instructions on the various tasks involved in data planning, compiling, validating and processing. They form, together with numerous training materials produced by international experts, a storehouse of reference materials that can be tapped at any time, as they are available on the Internet.

SPDs were an important innovation introduced into ICP 2005. They provide a framework for describing a product in terms of its price-forming characteristics. They encourage country experts to think logically about what items to choose not only for ICP but also for any other price index, such as CPI, wholesale price index and the like. One of the most difficult aspects of ICP is to ensure quality matching not only across countries but also among different markets and outlets within a country. SPDs help in reducing significantly the incidence and severity of quality mismatch.

### 5.4 ICP TOOL PACK

A potentially far-reaching contribution to capacity-building has been the development of computer software to capture, validate and compute PPPs. ICP Tool Pack has two main modules:

The Price Collection Module, or PCM, captures data and transmits them

to regional coordinators. It has been designed in such a way that countries can use it for their own CPI, and several countries in the Western Asia region have signaled their intention to do so.

The Data Processing Module, or DPM, enables country and regional coordinators to compile the data, detect errors and eliminate outliers. It has programs that look at individual item prices in each basic heading across all countries (the Quaranta table) and at all prices across basic headings and countries (the Dikhanov table). Those programs greatly facilitate the process of spotting errors and validating data, thus making the data as robust as can be.

Finally, regional and global coordinators use the module to compute PPPs quickly to keep track of the results, as the data are being edited, revised and validated. There are many iterations before the data and results are finalized, and the Tool Pack makes the process quick and easy.

### 5.5 TRAINING

Thanks to an intensive training program, all participating countries in the region now have Tool Pack installed on their computers and trained staff to run them. It took a while to perfect the software and develop local expertise. The staff were also trained in concepts and methods of ICP and all aspects of planning surveys, collecting prices, compiling national accounts based on 1993 SNA and validating the data. There were training sessions on how to deal with difficult areas such as housing, construction, health, education and government services. When individual countries faced difficulties in certain areas, international experts were dispatched to provide help. Often a neighboring country expert volunteered to help. Since price and national accounts are the bread and butter of national statistics, the trainings have significantly raised the level of expertise and capacity of local staff to produce better quality national statistics.

One of the most difficult aspects of ICP is to ensure quality matching not only across countries but also among different markets and outlets within a country. SPDs help in reducing significantly the incidence and severity of quality mismatch.

### **5.6 CRITICAL REVIEW OF NATIONAL STATISTICS**

ICP required every country to follow the concepts and practices in compilation of price and national accounts statistics as outlined in the ICP Handbook. Not every country was up to par in every aspect. Some countries needed help, for instance, in setting up a sampling frame for price data, compiling national accounts according to the 1993 SNA and producing a detailed breakdown of GDP expenditure at BH level. Not every country had the basic data or the expertise to produce the data. So when data were submitted, other participants as well as international experts subjected them to intense scrutiny, identified areas of weakness and offered assistance to fix them. The scrutiny also identified areas where countries could seek technical assistance from bilateral and multilateral donors. Thus, a process has begun to bring all country data to international standards and make them increasingly comparable across countries.

### **5.7 ACCESS TO INTERNATIONAL EXPERTS**

The ICP exercise has produced a pool of national and international experts who worked together. Regional and global coordinators have been ready to dispatch experts wherever they were needed. As a result, many of those experts are familiar with individual country problems and are easily accessible to countries as well as regional and global coordinators.



# Annex I

## DETAILED TABLES

The following tables are calculated using the EKS method (see annex II for details). EKS is considered to be the most appropriate method to compare different aggregates of GDP across economies. It must be noted, however, that expenditures by aggregate are not additive to higher levels of aggregation.

In addition to what is published here, more detailed information is available upon request. Such data may include BH expenditures and PPPs for a total of 100-plus lines. The detailed information provides significant insight into the price relatives of different expenditure categories for research purposes, but its use should be restricted to research and even then with appropriate precaution and caveats. Requests for regional data may be directed to UN-ESCWA. Requests for global estimates covering more than one region should be directed to the ICP Global Office.

**Table A1** Nominal per capita GDP and selected components in national currencies, 2005

**Table A2** Purchasing power parity estimates, national currency per Western Asia currency, 2005

**Table A3** Real per capita GDP and its components in Western Asia currency converted at regional PPPs, 2005

**Table A4** Indices of real per capita GDP (converted at regional PPPs), regional average = 100, 2005

**Table A5** Nominal per capita GDP and selected components in US dollar (converted at official exchange rates), 2005

**Table A6** Indices of nominal per capita GDP (converted at official exchange rates), regional average = 100, 2005

**Table A7** Price level indices (PPP/Exchange rate), 2005

**Table A8** Nominal total GDP and selected components in millions of national currencies, 2005

**Table A9** Real total GDP and its components in millions of Western Asian currency (converted at regional PPPs), 2005

**Table A10** Indices of real total GDP (converted at regional PPPs), regional average = 100, 2005

**Table A11** Nominal total GDP and selected components in millions of US dollars (converted at official exchange rates), 2005

**Table A12** Indices of nominal total GDP (converted at official exchange rates), regional average = 100, 2005



Table A1: Nominal per capita GDP and selected components in national currencies, 2005

Category Name	Bahrain	Egypt	Iraq	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabia	Syria	Yemen
GROSS DOMESTIC PRODUCT	6,775	8,159	1,787,746	1,634	9,601	8,654,782	4,725	188,585	51,149	80,034	158,179
ACTUAL FINAL HOUSEHOLD EXPENDITURE	3,553	6,277	1,007,362	1,588	3,655	7,845,488	1,922	41,310	18,847	59,397	108,993
INDIVIDUAL CONSUMPTION EXPENDITURE BY HOUSEHOLDS	3,171	5,968	830,653	1,437	3,159	7,409,016	1,660	33,792	14,619	55,676	101,600
FOOD AND NON ALCOHOLIC BEVERAGES	633	2,668	323,792	457	540	2,261,878	417	5,632	3,346	24,780	44,819
TOBACCO	18	175	7,958	48	76	168,520	9	104	66	153	2,219
CLOTHING AND FOOTWEAR	228	494	52,428	85	295	489,831	119	2,546	1,157	5,163	9,533
HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS	607	825	158,565	271	672	815,946	326	7,101	2,678	14,203	17,999
FURNISHINGS, HOUSEHOLD EQUIPMENT AND ROUTINE HOUSEHOLD MAINTENANCE	311	233	77,244	63	490	510,802	97	2,661	1,586	1,884	4,404
HEALTH	230	282	66,441	68	60	607,871	26	1,369	389	4,257	3,077
TRANSPORT	333	254	93,253	141	451	588,696	230	6,325	1,758	1,956	5,631
COMMUNICATION	75	167	11,701	58	93	110,849	72	1,909	422	184	746
RECREATION AND CULTURE	113	162	10,088	27	150	237,557	41	1,351	631	809	1,377
EDUCATION	146	203	2,310	87	117	1,005,127	35	2,185	485	905	677
RESTAURANTS AND HOTELS	73	198	7,224	45	87	420,974	43	641	720	1,087	2,638
MISCELLANEOUS GOODS AND SERVICES	190	436	20,281	81	199	491,138	211	1,970	658	295	8,641
NET PURCHASES FROM ABROAD	216	-129	-631	7	0.0	-300,171	34	0	722	0	-159
INDIVIDUAL CONSUMPTION EXPENDITURE BY GOVERNMENT	383	310	176,709	152	496	436,471	262	7,518	4,229	3,722	7,393
HEALTH	141	32	86,633	54	145	44,884	76	2,275	1,247	586	1,049
EDUCATION	242	278	90,077	97	351	391,587	186	5,243	2,982	3,136	6,344
COLLECTIVE CONSUMPTION EXPENDITURE BY GOVERNMENT	441	583	489,570	157	941	821,278	656	14,034	6,050	5,148	11,865
GROSS FIXED CAPITAL FORMATION	1,203	1,375	170,149	500	1,405	1,900,649	852	63,432	8,462	18,941	30,083
MACHINERY AND EQUIPMENT	373	637	103,508	197	259	421,417	439	30,086	3,665	9,684	11,209
CONSTRUCTION	827	701	48,126	247	1,145	1,267,384	284	25,738	4,050	9,258	17,741
OTHER PRODUCTS	36	37	18,515	55	0	211,848	129	7,608	748	0	1,133
CHANGES IN INVENTORIES AND ACQUISITIONS LESS DISPOSALS OF VALUABLES	62	53	10,3175	57	173	-14,913	4	3,633	675	-5,043	-773
BALANCE OF EXPORTS AND IMPORTS	1,517	-128	17,490	-668	3,428	-1,897,719	1,292	66,177	17,114	1,590	8,011

Table A2: Purchasing power parity estimates, national currency per Western Asia currency, 2005

Category Name	Bahrain	Egypt	Iraq	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabia	Syria	Yemen
GROSS DOMESTIC PRODUCT	0.48	3.28	1,073.76	0.73	0.41	1,628.83	0.45	5.28	4.63	37.89	133.55
ACTUAL FINAL HOUSEHOLD EXPENDITURE	0.57	3.47	1,092.37	0.84	0.52	1,943.44	0.53	6.61	5.46	40.78	150.78
INDIVIDUAL CONSUMPTION EXPENDITURE BY HOUSEHOLDS	0.58	3.64	1,155.15	0.89	0.50	1,998.69	0.52	6.57	5.24	44.50	164.40
FOOD AND NON-ALCOHOLIC BEVERAGES	0.47	4.79	1,343.49	0.84	0.37	1,883.00	0.45	4.54	4.94	46.14	187.85
TOBACCO	0.42	5.68	1,449.98	0.81	0.32	1,949.12	0.44	3.96	3.96	43.72	121.90
CLOTHING AND FOOTWEAR	0.47	3.97	1,102.72	0.75	0.62	3,342.89	0.45	5.31	4.39	50.41	147.06
HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS	1.03	2.51	1,383.85	1.26	0.76	1,498.03	0.82	17.37	6.34	47.58	145.72
FURNISHINGS, HOUSEHOLD EQUIPMENT AND ROUTINE HOUSEHOLD MAINTENANCE	0.43	4.24	832.84	0.88	0.40	2,126.51	0.41	4.25	3.96	44.55	182.73
HEALTH	1.14	3.35	947.47	1.23	1.15	3,175.01	0.88	12.70	8.36	50.52	142.18
TRANSPORT	0.45	3.02	1,115.48	0.74	0.36	1,740.25	0.43	3.70	4.69	50.73	179.33
COMMUNICATION	0.32	5.63	966.03	0.42	0.28	1,597.68	0.34	3.29	5.07	29.73	190.79
RECREATION AND CULTURE	0.43	3.24	1,239.72	0.73	0.43	1,777.28	0.38	4.18	5.43	31.75	164.97
EDUCATION	1.09	1.98	1,194.90	1.31	1.15	2,583.42	1.07	15.95	14.82	37.60	54.26
RESTAURANTS AND HOTELS	0.38	4.03	1,099.50	0.84	0.38	2,781.28	0.37	3.57	4.45	33.23	151.04
MISCELLANEOUS GOODS AND SERVICES	0.50	3.80	1,118.85	0.97	0.56	2,145.53	0.47	4.93	5.20	38.18	186.11
NET PURCHASES FROM ABROAD	0.38	5.78	1,473.00	0.71	0.29	1,507.50	0.38	3.64	3.75	52.14	191.42
INDIVIDUAL CONSUMPTION EXPENDITURE BY GOVERNMENT	0.56	2.20	711.58	0.54	0.65	1,546.07	0.58	6.39	6.14	17.75	68.76
HEALTH	0.57	1.45	809.41	0.59	0.46	1,416.25	0.56	4.54	5.26	23.44	76.38
EDUCATION	0.56	2.36	656.36	0.52	0.74	1,575.44	0.59	7.34	6.62	16.30	66.18
COLLECTIVE CONSUMPTION EXPENDITURE BY GOVERNMENT	0.57	2.67	910.01	0.55	0.53	1,370.83	0.46	5.78	5.48	28.41	90.44
GROSS FIXED CAPITAL FORMATION	0.39	4.42	1,391.26	0.72	0.32	1,394.30	0.39	4.77	4.01	44.94	135.00
MACHINERY AND EQUIPMENT	0.38	6.10	1,305.91	0.68	0.32	1,462.21	0.37	3.86	3.63	55.76	186.89
CONSTRUCTION	0.42	3.63	1,633.26	0.77	0.34	1,537.94	0.44	4.75	4.49	39.10	109.73
OTHER PRODUCTS	0.29	3.00	972.68	0.68	0.19	772.25	0.35	14.78	3.69	36.96	197.31

Table A3: Real per capita GDP and its components in Western Asia currency converted at regional PPPs, 2005

Category Name	Bahrain	Egypt	Iraq	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabia	Syria	Yemen
GROSS DOMESTIC PRODUCT	14,171	2,484	1,665	2,234	23,387	5,314	10,580	35,744	11,041	2,112	1,184
ACTUAL FINAL HOUSEHOLD EXPENDITURE	6,192	1,810	922	1,880	6,985	4,037	3,659	6,248	3,451	1,457	723
INDIVIDUAL CONSUMPTION EXPENDITURE BY HOUSEHOLDS	5,499	1,638	719	1,614	6,275	3,707	3,218	5,141	27,890	1,251	618
FOOD AND NON-ALCOHOLIC BEVERAGES	1,352	557	241	542	1,459	1,201	924	1,240	677	537	239
TOBACCO	41	31	6	60	23	87	21	26	167	4	18
CLOTHING AND FOOTWEAR	480	125	48	114	479	147	266	480	264	102	65
HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS	591	328	115	215	888	545	399	409	423	299	124
FURNISHINGS, HOUSEHOLD EQUIPMENT AND ROUTINE HOUSEHOLD MAINTENANCE	724	55	93	71	1,228	240	233	627	401	42	24
HEALTH	202	84	70	55	52	192	30	108	47	84	22
TRANSPORT	744	84	84	192	1,252	338	530	1,710	375	39	31
COMMUNICATION	231	30	12	139	330	69	213	579	83	6	4
RECREATION AND CULTURE	265	50	8	37	344	134	107	323	116	26	8
EDUCATION	133	103	2	67	102	389	33	137	33	24	13
RESTAURANTS AND HOTELS	191	50	7	54	231	151	117	179	162	33	18
MISCELLANEOUS GOODS AND SERVICES	377	115	18	83	353	229	450	400	127	8	46
NET PURCHASES FROM ABROAD	575	-22	0	10	0	-199	87	0	193	0	0
INDIVIDUAL CONSUMPTION EXPENDITURE BY GOVERNMENT	682	141	248	279	762	282	453	1,176	689	210	108
HEALTH	249	22	107	92	312	32	134	501	237	25	14
EDUCATION	432	118	137	187	471	249	317	714	450	192	96
COLLECTIVE CONSUMPTION EXPENDITURE BY GOVERNMENT	779	218	538	283	1,786	599	1,433	2,427	1,104	181	131
GROSS FIXED CAPITAL FORMATION	3,066	311	122	696	4,347	1,363	2,176	13,286	2,112	421	223
MACHINERY AND EQUIPMENT	970	104	79	292	806	288	1,173	7,802	1,010	174	60
CONSTRUCTION	1,989	193	30	321	3,359	824	642	5,415	903	237	162
OTHER PRODUCTS	12	12	20	80	0	274	372	515	203	0	6

Table A4: Indices of real per capita GDP (converted at regional PPPs), regional average = 100, 2005

Category Name	Bahrain	Egypt	Iraq	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabia	Syria	Yemen
GROSS DOMESTIC PRODUCT	358	63	42	57	591	134	268	904	279	53	30
ACTUAL FINAL HOUSEHOLD EXPENDITURE	324	95	48	99	366	211	192	327	181	76	38
INDIVIDUAL CONSUMPTION EXPENDITURE BY HOUSEHOLDS	334	99	44	98	381	225	195	312	170	76	38
FOOD AND NON-ALCOHOLIC BEVERAGES	259	107	46	104	280	230	177	238	130	103	46
TOBACCO	184	137	24	266	104	385	93	117	74	16	81
CLOTHING AND FOOTWEAR	365	95	36	87	364	111	202	364	200	78	49
HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS	203	113	39	74	305	187	137	140	145	103	42
FURNISHINGS, HOUSEHOLD EQUIPMENT AND ROUTINE HOUSEHOLD MAINTENANCE	555	42	71	55	942	184	178	480	307	32	19
HEALTH	287	119	1000	79	73	272	42	153	66	120	31
TRANSPORT	486	55	55	125	817	221	346	1,117	245	25	21
COMMUNICATION	538	69	28	324	769	162	497	1,349	193	14	9
RECREATION AND CULTURE	500	94	15	69	648	252	202	609	219	48	16
EDUCATION	211	163	3	106	162	618	52	218	52	38	20
RESTAURANTS AND HOTELS	324	83	11	91	392	257	199	305	275	56	30
MISCELLANEOUS GOODS AND SERVICES	403	122	19	89	378	244	480	427	135	8	50
NET PURCHASES FROM ABROAD	3,590	-139	-3	59	0	-1242	543	0	1,202	0	-5
INDIVIDUAL CONSUMPTION EXPENDITURE BY GOVERNMENT	261	54	95	107	292	108	173	450	264	80	41
HEALTH	334	29	144	123	419	43	181	673	319	34	18
EDUCATION	231	63	74	100	253	133	170	383	241	103	51
COLLECTIVE CONSUMPTION EXPENDITURE BY GOVERNMENT	180	50	124	65	412	138	330	660	254	42	30
GROSS FIXED CAPITAL FORMATION	433	44	17	98	613	192	307	1,875	298	60	31
MACHINERY AND EQUIPMENT	328	35	27	99	272	97	397	2,636	341	59	20
CONSTRUCTION	550	54	8	89	929	228	178	1,498	250	66	45
OTHER PRODUCTS	24	24	37	156	0	534	724	1,001	394	0	11

Table A5: Nominal per capita GDP and selected components in US dollar (converted at official exchange rate), 2005

Category Name	Bahrain	Egypt	Iraq	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabia	Syria	Yemen
GROSS DOMESTIC PRODUCT	18,019	1,412	1,214	2,304	32,882	5,741	12,289	51,809	13,640	1,535	826
ACTUAL FINAL HOUSEHOLD EXPENDITURE	9,450	1,086	684	2,240	12,517	5,204	4,997	11,349	5,026	1,139	569
INDIVIDUAL CONSUMPTION EXPENDITURE BY HOUSEHOLDS	8,433	1,033	564	2,026	10,818	4,915	4,316	9,284	3,898	1,068	531
FOOD AND NON-ALCOHOLIC BEVERAGES	1,682	462	220	644	1,849	1,500	1,086	1,547	892	475	234
TOBACCO	47	30	5	68	26	112	24	29	18	3	12
CLOTHING AND FOOTWEAR	606	86	36	120	1,010	325	310	700	309	99	50
HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS	1,614	143	108	382	2,300	541	847	1,951	714	272	94
FURNISHINGS, HOUSEHOLD EQUIPMENT AND ROUTINE HOUSEHOLD MAINTENANCE	828	40	52	88	1,678	339	251	731	423	36	23
HEALTH	611	49	45	96	204	403	68	376	104	82	16
TRANSPORT	885	44	63	199	1,543	391	599	1,738	469	38	30
COMMUNICATION	200	29	8	82	319	74	188	524	112	4	4
RECREATION AND CULTURE	300	28	7	38	512	158	107	371	168	16	7
EDUCATION	386	35	2	123	400	667	90	600	129	17	4
RESTAURANTS AND HOTELS	194	34	5	64	298	279	111	176	192	21	14
MISCELLANEOUS GOODS AND SERVICES	505	75	14	114	680	326	548	541	175	6	45
NET PURCHASES FROM ABROAD	575	-22	0	10		-199	87	0	193	0	0
INDIVIDUAL CONSUMPTION EXPENDITURE BY GOVERNMENT	1,017	54	120	214	1,699	290	681	2,065	1,128	71	39
HEALTH	375	6	59	77	497	30	197	625	333	11	6
EDUCATION	643	48	61	137	1,202	260	484	1,440	795	60	34
COLLECTIVE CONSUMPTION EXPENDITURE BY GOVERNMENT	1,173	101	332	221	3,221	549	1,706	3,856	1,613	99	62
GROSS FIXED CAPITAL FORMATION	3,199	238	116	705	4,810	1,261	2,216	17,426	2,257	363	157
MACHINERY AND EQUIPMENT	992	110	70	278	888	280	1,142	8,265	977	186	59
CONSTRUCTION	2,198	121	33	349	3,922	841	738	7,071	1,080	178	93
OTHER PRODUCTS	9	6	13	77	0	141	336	2,090	199	0	6
CHANGES IN INVENTORIES AND ACQUISITIONS LESS DISPOSALS OF VALUABLES	162	9	70	81	593	-10	10	998	180	-97	-4
BALANCE OF EXPORTS AND IMPORTS	4,035	-22	12	-942	11,741	-1,259	3,361	18,180	4,564	31	42

Table A6: Indices of nominal per capita GDP (converted at official exchange rates), regional average = 100, 2005

Category Name	Bahrain	Egypt	Iraq	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabia	Syria	Yemen
GROSS DOMESTIC PRODUCT	456	36	31	58	831	145	311	1,310	345	39	21
ACTUAL FINAL HOUSEHOLD EXPENDITURE	495	57	36	117	656	273	262	594	263	60	30
INDIVIDUAL CONSUMPTION EXPENDITURE BY HOUSEHOLDS	512	63	34	13	656	298	262	563	237	65	32
FOOD AND NON-ALCOHOLIC BEVERAGES	323	89	42	124	355	288	208	297	171	91	45
TOBACCO	207	135	24	304	114	498	107	127	78	13	52
CLOTHING AND FOOTWEAR	462	65	27	92	768	247	236	531	234	75	38
HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS	554	49	37	131	790	186	291	670	245	94	32
FURNISHINGS, HOUSEHOLD EQUIPMENT AND ROUTINE HOUSEHOLD MAINTENANCE	634	31	40	68	1,286	260	192	560	324	28	18
HEALTH	867	69	64	136	290	573	96	534	147	116	23
TRANSPORT	578	29	41	130	1,008	255	391	1,135	306	25	20
COMMUNICATION	465	67	19	190	744	171	436	1,221	262	8	9
RECREATION AND CULTURE	565	53	123	71	964	297	201	699	317	29	14
EDUCATION	614	56	3	195	636	1,060	143	954	205	28	6
RESTAURANTS AND HOTELS	330	58	8	108	507	475	189	299	326	35	23
MISCELLANEOUS GOODS AND SERVICES	539	81	15	121	726	348	586	578	187	6	48
NET PURCHASES FROM ABROAD	3,590	-139	-3	59	0	-1,242	543	0	1,202	0	-5
INDIVIDUAL CONSUMPTION EXPENDITURE BY GOVERNMENT	390	21	46	82	651	111	261	791	432	27	15
HEALTH	503	7	79	103	668	40	265	840	447	15	7
EDUCATION	344	26	33	74	644	139	259	772	426	32	18
COLLECTIVE CONSUMPTION EXPENDITURE BY GOVERNMENT	270	23	77	51	743	126	393	889	372	23	14
GROSS FIXED CAPITAL FORMATION	451	34	16	99	679	178	313	2,459	318	51	22
MACHINERY AND EQUIPMENT	335	37	24	94	300	95	386	2,793	330	63	20
CONSTRUCTION	608	34	9	97	1,085	233	204	1,956	299	49	26
OTHER PRODUCTS	18	13	25	150	0	273	653	4,065	388	0	12
CHANGES IN INVENTORIES AND ACQUISITIONS LESS DISPOSALS OF VALUABLES	370	21	160	184	1,349	-23	23	2,272	410	-220	-9
BALANCE OF EXPORTS AND IMPORTS	470	-3	1	-110	1,367	-147	391	2,116	531	4	5

Table A7: Price level indices (PPP/Exchange rate), 2005

Category Name	Bahrain	Egypt	Iraq	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabia	Syria	Yemen
GROSS DOMESTIC PRODUCT	1.27	0.57	0.73	1.03	1.41	1.08	1.16	1.45	1.24	0.73	0.70
ACTUAL FINAL HOUSEHOLD EXPENDITURE	1.53	0.60	0.74	1.19	1.79	1.29	1.37	1.82	1.46	0.78	0.79
INDIVIDUAL CONSUMPTION EXPENDITURE BY HOUSEHOLDS	1.53	0.63	0.78	1.26	1.72	1.33	1.34	1.81	1.40	0.85	0.86
FOOD AND NON-ALCOHOLIC BEVERAGES	1.24	0.83	0.91	1.19	1.27	1.25	1.17	1.25	1.32	0.88	0.98
TOBACCO	1.13	0.98	0.98	1.14	1.10	1.29	1.15	1.09	1.06	0.84	0.64
CLOTHING AND FOOTWEAR	1.26	0.69	0.75	1.06	2.11	2.22	1.17	1.46	1.17	0.97	0.77
HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS	2.73	0.44	0.94	1.77	2.59	0.99	2.13	4.77	1.69	0.91	0.76
FURNISHINGS, HOUSEHOLD EQUIPMENT AND ROUTINE HOUSEHOLD MAINTENANCE	1.14	0.73	0.57	1.24	1.37	1.41	1.08	1.17	1.06	0.85	0.95
HEALTH	3.02	0.58	0.64	1.73	3.95	2.11	2.28	3.49	2.23	0.97	0.74
TRANSPORT	1.19	0.52	0.76	1.04	1.23	1.15	1.13	1.02	1.25	0.97	0.94
COMMUNICATION	0.86	0.97	0.66	0.59	0.97	1.06	0.88	0.91	1.35	0.57	1.00
RECREATION AND CULTURE	1.13	0.56	0.84	1.03	1.49	1.18	1.00	1.15	1.45	0.61	0.86
EDUCATION	2.91	0.34	0.81	1.85	3.93	1.71	2.78	4.38	3.95	0.72	0.28
RESTAURANTS AND HOTELS	1.02	0.70	0.75	1.19	1.29	1.84	0.95	0.98	1.19	0.64	0.79
MISCELLANEOUS GOODS AND SERVICES	1.34	0.66	0.76	1.37	1.93	1.42	1.22	1.35	1.39	0.73	0.97
NET PURCHASES FROM ABROAD	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
INDIVIDUAL CONSUMPTION EXPENDITURE BY GOVERNMENT	1.49	0.38	0.48	0.77	2.23	1.03	1.50	1.76	1.64	0.34	0.36
HEALTH	1.51	0.25	0.55	0.83	1.59	0.94	1.47	1.25	1.40	0.45	0.40
EDUCATION	1.49	0.41	0.45	0.74	2.55	1.05	1.53	2.02	1.77	0.31	0.35
COLLECTIVE CONSUMPTION EXPENDITURE BY GOVERNMENT	1.50	0.46	0.62	0.78	1.80	0.91	1.19	1.59	1.46	0.54	0.47
GROSS FIXED CAPITAL FORMATION	1.04	0.77	0.94	1.01	1.11	0.92	1.02	1.31	1.07	0.86	0.71
MACHINERY AND EQUIPMENT	1.02	1.06	0.89	0.96	1.10	0.97	0.97	1.06	0.97	1.07	0.98
CONSTRUCTION	1.11	0.63	1.11	1.09	1.17	1.02	1.15	1.31	1.20	0.75	0.57
OTHER PRODUCTS	0.78	0.52	0.66	0.96	0.64	0.51	0.90	4.06	0.98	0.71	1.03

Table A8: Nominal total GDP and selected components in millions of national currencies, 2005

Category Name	Bahrain	Egypt	Iraq	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabia	Syria	Yemen
GROSS DOMESTIC PRODUCT	503	571,129	49,990,680	8,942	23,593	32,499,000	11,856	153,290	1,182,514	1,479,667	3,208,501
ACTUAL FINAL HOUSEHOLD EXPENDITURE	2,639	439,390	28,168,832	8,692	8,981	29,460,073	4,821	33,579	435,734	1,098,132	2,210,804
INDIVIDUAL CONSUMPTION EXPENDITURE BY HOUSEHOLDS	2,355	417,722	23,227,526	7,862	7,762	27,821,108	4,164	27,468	337,968	1,029,329	2,060,851
FOOD AND NON-ALCOHOLIC BEVERAGES	470	186,758	9,054,196	2,499	1,327	8,493,429	1,047	4,578	77,363	458,127	909,108
TOBACCO	13	12,265	222,517	265	18	632,799	23	84	1,524	2,828	45,010
CLOTHING AND FOOTWEAR	169	34,589	1,466,047	467	725	1,839,331	299	2,070	26,753	95,456	193,368
HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS	451	57,743	4,433,942	1,480	1,650	3,063,903	818	5,772	61,918	262,578	365,084
FURNISHINGS, HOUSEHOLD EQUIPMENT AND ROUTINE HOUSEHOLD MAINTENANCE	231	16,297	2,159,972	342	1,204	1,918,080	242	2,163	36,662	34,824	89,339
HEALTH	171	19,711	1,857,879	372	147	2,282,575	65	1,113	8,998	78,696	62,403
TRANSPORT	247	17,746	2,607,636	773	1,107	2,210,573	578	5,141	40,649	36,169	114,222
COMMUNICATION	56	11,703	327,181	317	229	416,240	181	1,551	9,748	3,405	15,122
RECREATION AND CULTURE	84	11,335	282,093	146	368	892,036	103	1,099	14,592	14,954	27,920
EDUCATION	108	14,240	64,591	477	287	3,774,285	87	1,776	11,206	16,731	13,730
RESTAURANTS AND HOTELS	54	13,844	201,992	247	214	1,580,770	107	521	16,653	20,104	53,500
MISCELLANEOUS GOODS AND SERVICES	141	30,497	567,113	441	488	1,844,240	529	1,601	15,208	5,459	175,264
NET PURCHASES FROM ABROAD	161	-9,006	-17,632	37	0	-1,127,154	84	0	16,695	0	-3,218
INDIVIDUAL CONSUMPTION EXPENDITURE BY GOVERNMENT	284	21,669	4,941,306	830	1,219	1,638,964	657	6,111	97,766	68,803	149,953
HEALTH	105	2,228	2,422,526	297	35	168,542	190	1,849	28,832	10,826	21,268
EDUCATION	180	19,440	2,518,780	533	862	1,470,423	467	4,262	68,934	57,977	128,686
COLLECTIVE CONSUMPTION EXPENDITURE BY GOVERNMENT	327	40,773	13,689,829	857	2,311	3,083,928	1,645	11,407	139,874	95,182	240,674
GROSS FIXED CAPITAL FORMATION	893	96,226	4,757,878	2,734	3,451	7,137,000	2,138	51,560	195,632	350,181	610,198
MACHINERY AND EQUIPMENT	277	44,559	2,894,403	1,081	637	1,5824,36	1,102	24,455	84,726	179,029	227,365
CONSTRUCTION	614	49,075	1,345,744	1,353	2,814	4,759,069	712	20,921	93,620	171,153	359,863
OTHER PRODUCTS	3	2,592	517,730	300	0	795,495	324	6,184	17,286	0	22,971
CHANGES IN INVENTORIES AND ACQUISITIONS LESS DISPOSALS OF VALUABLES	45	3,710	2,885,081	314	425	-56,000	10	2,953	15,615	-93,230	-15,675
BALANCE OF EXPORTS AND IMPORTS	1,127	-8970	489,060	-3,656	8,424	-7,126,000	3,242	53,791	395,660	29,402	162,500

Table A9: Real total GDP and its components in millions of Western Asia currency (converted at regional PPPs), 2005

Category Name	Bahrain	Egypt	Iraq	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabia	Syria	Yemen
GROSS DOMESTIC PRODUCT	10,523	173,884	46,557	12,227	57,468	19,952	26,545	29,054	25,5260	39,048	24,024
ACTUAL FINAL HOUSEHOLD EXPENDITURE	4,598	126,662	25,787	10,290	17,165	15,159	9,181	5,079	79,790	26,930	14,663
INDIVIDUAL CONSUMPTION EXPENDITURE BY HOUSEHOLDS	4,083	114,671	20,108	8,834	15,419	13,920	8,074	4,179	64,499	23,129	12,536
FOOD AND NON-ALCOHOLIC BEVERAGES	1,003	39,013	6,739	2,967	3,586	4,511	2,319	1,008	15,646	9,930	4,840
TOBACCO	31	2,158	154	327	57	325	52	21	385	65	369
CLOTHING AND FOOTWEAR	357	8,713	1,330	623	1,178	550	667	390	6,099	1,893	1,315
HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS	439	22,966	3,204	1,177	2,182	2,045	1000	332	9,769	5,519	2,506
FURNISHINGS, HOUSEHOLD EQUIPMENT AND ROUTINE HOUSEHOLD MAINTENANCE	538	3,847	2,594	389	3,019	902	584	509	9,261	782	489
HEALTH	150	5,882	1,961	303	127	719	75	88	1,077	1,558	439
TRANSPORT	552	5,876	2,338	1,050	3,075	1,270	1,329	1,390	8,661	713	637
COMMUNICATION	172	2,079	339	762	812	261	535	471	1,921	115	79
RECREATION AND CULTURE	197	3,496	228	200	845	502	269	263	2,686	471	169
EDUCATION	99	7,174	54	364	250	1,461	82	111	756	445	253
RESTAURANTS AND HOTELS	142	3,437	184	293	567	569	293	146	3,746	605	354
MISCELLANEOUS GOODS AND SERVICES	280	8,017	507	453	867	860	1,128	325	2,924	143	942
NET PURCHASES FROM ABROAD	427	-1,558	-12	52	0	-748	218	0	4452	0	-17
INDIVIDUAL CONSUMPTION EXPENDITURE BY GOVERNMENT	507	9,870	6,944	1,527	1,873	1,060	1,136	956	1,5924	3,877	2,181
HEALTH	185	1,534	2,993	502	767	119	337	407	5486	462	278
EDUCATION	321	8225	3,838	1,021	1,158	933	795	581	1,0412	3,557	1,945
COLLECTIVE CONSUMPTION EXPENDITURE BY GOVERNMENT	579	15,279	15,044	1,549	4,387	2,250	3,595	1,972	2,5520	3,351	2,661
GROSS FIXED CAPITAL FORMATION	2,277	21,762	3,420	3,808	10,681	5,119	5,459	10,800	48,829	7,791	4,520
MACHINERY AND EQUIPMENT	721	7,301	2,216	1,596	1,981	1,082	2,943	6,342	23,361	3,210	1,217
CONSTRUCTION	1,477	13,529	824	1,755	8,253	3,094	1,611	4,402	20,866	4,377	3,280
OTHER PRODUCTS	9	865	532	439	0	1,030	934	418	4,685	0	117

Table A10: Indices of real total GDP (converted at regional PPPs), regional average = 100, 2005

Category Name	Bahrain	Egypt	Iraq	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabia	Syria	Yemen
GROSS DOMESTIC PRODUCT	1.52	25.04	6.70	1.76	8.27	2.87	3.82	4.18	36.75	5.62	3.46
ACTUAL FINAL HOUSEHOLD EXPENDITURE	1.37	37.78	7.69	3.07	5.12	4.52	2.74	1.51	23.80	8.03	4.37
INDIVIDUAL CONSUMPTION EXPENDITURE BY HOUSEHOLDS	1.41	39.62	6.95	3.05	5.33	4.81	2.79	1.44	22.28	7.99	4.33
FOOD AND NON-ALCOHOLIC BEVERAGES	1.10	42.61	7.36	3.24	3.92	4.93	2.53	1.10	17.09	10.85	5.29
TOBACCO	0.78	54.72	3.89	8.30	1.45	8.23	1.32	0.54	9.76	1.64	9.36
CLOTHING AND FOOTWEAR	1.54	37.69	5.75	2.70	5.10	2.38	2.89	1.69	26.39	8.19	5.69
HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS	0.86	44.91	6.27	2.30	4.27	4.00	1.96	0.65	19.10	10.79	4.90
FURNISHINGS, HOUSEHOLD EQUIPMENT AND ROUTINE HOUSEHOLD MAINTENANCE	2.35	16.79	11.32	1.70	13.17	3.94	2.55	2.22	40.42	3.41	2.13
HEALTH	1.21	47.52	15.84	2.45	1.03	5.81	0.60	0.71	8.70	12.58	3.55
TRANSPORT	2.05	21.85	8.69	3.91	11.44	4.72	4.94	5.17	32.21	2.65	2.37
COMMUNICATION	2.28	27.56	4.49	10.10	10.76	3.45	7.10	6.24	25.46	1.52	1.05
RECREATION AND CULTURE	2.11	37.49	2.44	2.14	9.06	5.38	2.88	2.82	28.80	5.05	1.81
EDUCATION	0.89	64.93	0.49	3.29	2.26	13.22	0.74	1.01	6.84	4.03	2.29
RESTAURANTS AND HOTELS	1.37	33.26	1.78	2.83	5.48	5.50	2.84	1.41	36.25	5.85	3.43
MISCELLANEOUS GOODS AND SERVICES	1.70	48.75	3.08	2.76	5.27	5.23	6.86	1.98	17.78	0.87	5.73
NET PURCHASES FROM ABROAD	15.18	-55.37	-0.43	1.84	0.00	-26.57	7.76	0.00	158.18	0.00	-0.60
INDIVIDUAL CONSUMPTION EXPENDITURE BY GOVERNMENT	1.11	21.52	15.14	3.33	4.09	2.31	2.48	2.08	34.73	8.45	4.76
HEALTH	1.41	11.73	22.90	3.84	5.87	0.91	2.58	3.11	41.98	3.53	2.13
EDUCATION	0.98	25.09	11.71	3.11	3.53	2.85	2.42	1.77	31.76	10.85	5.93
COLLECTIVE CONSUMPTION EXPENDITURE BY GOVERNMENT	0.76	20.06	19.75	2.03	5.76	2.95	4.72	2.59	33.50	4.40	3.49
GROSS FIXED CAPITAL FORMATION	1.83	17.48	2.75	3.06	8.58	4.11	4.39	8.68	39.23	6.26	3.63
MACHINERY AND EQUIPMENT	1.39	14.05	4.26	3.07	3.81	2.08	5.66	12.20	44.95	6.18	2.34
CONSTRUCTION	2.33	21.32	1.30	2.77	13.00	4.88	2.54	6.94	32.88	6.90	5.17
OTHER PRODUCTS	0.10	9.58	5.90	4.86	0.00	11.41	10.34	4.63	51.89	0.00	1.29

Table A11: Nominal total GDP and selected components in millions of US dollars (converted at official exchange rates), 2005

Category Name	Bahrain	Egypt	Iraq	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabia	Syria	Yemen
GROSS DOMESTIC PRODUCT	13,380	98,832	33,938	12,612	80,798	21,558	30,833.8	42,113	315,337	28,379	16,762
ACTUAL FINAL HOUSEHOLD EXPENDITURE	7,018	76,035	19,123	12,260	30,757	19,542	12,538.5	9,225	116,196	21,061	11,550
INDIVIDUAL CONSUMPTION EXPENDITURE BY HOUSEHOLDS	6,262	72,285	15,769	11,089	26,583	18,455	10,829.4	7,546	90,125	19,742	10,766
FOOD AND NON-ALCOHOLIC BEVERAGES	1,249	32,318	6,147	3,524	4,543	5,634	2,723.7	1,258	20,630	8,787	4,749
TOBACCO	35	2,122	151	373	63	420	60.1	23	406	54	235
CLOTHING AND FOOTWEAR	450	5,986	995	659	2,483	1,220	778.2	569	7,134	1,831	1,010
HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS	1,198	9,992	3,010	2,088	5,651	2,032	2,126.2	1,586	16,511	5,036	1,907
FURNISHINGS, HOUSEHOLD EQUIPMENT AND ROUTINE HOUSEHOLD MAINTENANCE	615	2,820	1,466	482	4,122	1,272	629.8	594	9,777	668	467
HEALTH	454	3,411	1,261	525	502	1,514	170.2	306	2,400	1,509	326
TRANSPORT	657	3,071	1,770	1,090	3,791	1,466	1,503.2	1,412	10,840	694	597
COMMUNICATION	148	2,025	222	447	785	276	470.4	426	2,600	65	79
RECREATION AND CULTURE	223	1,961	192	206	1,258	592	268.0	302	3,891	287	146
EDUCATION	287	2,464	44	673	983	2,504	226.3	488	2,988	321	72
RESTAURANTS AND HOTELS	144	2,396	137	348	733	1,049	279.0	143	4,441	386	280
MISCELLANEOUS GOODS AND SERVICES	375	5,277	385	622	1,670	1,223	1,375.9	440	4,056	105	916
NET PURCHASES FROM ABROAD	427	-1,558	-12	52	0	-748	218.3	0	4,452	0	-17
INDIVIDUAL CONSUMPTION EXPENDITURE BY GOVERNMENT	756	3,750	3,355	1,171	4,174	1,087	1,709.1	1,679	26,071	1,320	783
HEALTH	278	386	1,644	419	1,221	112	494.4	508	7,688	208	111
EDUCATION	477	3,364	1,710	752	2,953	975	1,214.7	1,171	18,382	1,112	672
COLLECTIVE CONSUMPTION EXPENDITURE BY GOVERNMENT	871	7,056	9,294	1,209	7,916	2,046	4,279.3	3,134	37,300	1,826	1,257
GROSS FIXED CAPITAL FORMATION	2,376	16,652	3,230	3,856	11,820	4,734	5,559.4	14,165	52,169	6,716	3,188
MACHINERY AND EQUIPMENT	736	7,711	1,965	1,524	2,183	1,050	2,866.0	6,719	22,594	3,434	1,188
CONSTRUCTION	1632	8,492	914	1,909	9,637	3,157	1,851.1	5,748	24,965	3,283	1,880
OTHER PRODUCTS	7	449	352	423	0	528	842.3	1,699	4,610	0	120
CHANGES IN INVENTORIES AND ACQUISITIONS LESS DISPOSALS OF VALUABLES	121	641	1,959	443	1,456	-37	24.9	811	4,164	-1,788	-82
BALANCE OF EXPORTS AND IMPORTS	2,996	-1,552	332	-5,156	28,849	-4,727	8431.7	1,4778	105,509	564	849

Table A12: Indices of nominal total GDP (converted at official exchange rates), regional average = 100, 2005

Category Name	Bahrain	Egypt	Iraq	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabia	Syria	Yemen
GROSS DOMESTIC PRODUCT	1.93	14.23	4.89	1.82	11.63	3.10	4.44	6.06	45.40	4.09	2.41
ACTUAL FINAL HOUSEHOLD EXPENDITURE	2.09	22.68	5.70	3.66	9.17	5.83	3.74	2.75	34.65	6.28	3.44
INDIVIDUAL CONSUMPTION EXPENDITURE BY HOUSEHOLDS	2.16	24.97	5.45	3.83	9.18	6.38	3.74	2.61	31.14	6.82	3.72
FOOD AND NON-ALCOHOLIC BEVERAGES	1.36	35.30	6.71	3.85	4.96	6.15	2.97	1.37	22.53	9.60	5.19
TOBACCO	0.88	53.82	3.83	9.47	1.60	10.65	1.53	0.59	10.31	1.38	5.96
CLOTHING AND FOOTWEAR	1.95	25.90	4.31	2.85	10.74	5.28	3.37	2.46	30.86	7.92	4.37
HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS	2.34	19.54	5.89	4.08	11.05	3.97	4.16	3.10	32.29	9.85	3.73
FURNISHINGS, HOUSEHOLD EQUIPMENT AND ROUTINE HOUSEHOLD MAINTENANCE	2.68	12.31	6.40	2.10	17.99	5.55	2.75	2.59	42.67	2.91	2.04
HEALTH	3.67	27.56	10.19	4.24	4.05	12.23	1.37	2.47	19.39	12.19	2.63
TRANSPORT	2.44	11.42	6.58	4.05	14.10	5.45	5.59	5.25	40.31	2.58	2.22
COMMUNICATION	1.97	26.84	2.94	5.93	10.40	3.66	6.24	5.65	34.46	0.87	1.05
RECREATION AND CULTURE	2.39	21.03	2.05	2.21	13.49	6.35	2.87	3.24	41.73	3.08	1.56
EDUCATION	2.59	22.30	0.40	6.09	8.89	22.66	2.05	4.42	27.04	2.90	0.65
RESTAURANTS AND HOTELS	1.40	23.18	1.33	3.37	7.09	10.15	2.70	1.38	42.97	3.73	2.70
MISCELLANEOUS GOODS AND SERVICES	2.28	32.09	2.34	3.78	10.16	7.44	8.37	2.68	24.66	0.64	5.57
NET PURCHASES FROM ABROAD	15.18	-55.37	-0.43	1.84	0.00	-26.57	7.76	0.00	158.18	0.00	-0.60
INDIVIDUAL CONSUMPTION EXPENDITURE BY GOVERNMENT	1.65	8.18	7.32	2.55	9.10	2.37	3.73	3.66	56.86	2.88	1.71
HEALTH	2.13	2.95	12.58	3.21	9.34	0.86	3.78	3.89	58.83	1.59	0.85
EDUCATION	1.46	10.26	5.22	2.29	9.01	2.98	3.71	3.57	56.07	3.39	2.05
COLLECTIVE CONSUMPTION EXPENDITURE BY GOVERNMENT	1.14	9.26	12.20	1.59	10.39	2.69	5.62	4.11	48.96	2.40	1.65
GROSS FIXED CAPITAL FORMATION	1.91	13.38	2.60	3.10	9.50	3.80	4.47	11.38	41.91	5.40	2.56
MACHINERY AND EQUIPMENT	1.42	14.84	3.78	2.93	4.20	2.02	5.51	12.93	43.48	6.61	2.29
CONSTRUCTION	2.57	13.38	1.44	3.01	15.18	4.97	2.92	9.06	39.34	5.17	2.96
OTHER PRODUCTS	0.08	4.97	3.89	4.69	0.00	5.84	9.33	18.82	51.06	0.00	1.33
CHANGES IN INVENTORIES AND ACQUISITIONS LESS DISPOSALS OF VALUABLES	1.56	8.32	25.39	5.75	18.88	-0.48	0.32	10.52	53.98	-23.18	-1.06
BALANCE OF EXPORTS AND IMPORTS	1.99	-1.03	0.22	-3.42	19.12	-3.13	5.59	9.79	69.93	0.37	0.56



# Annex II

## METHODS OF COMPUTING PPP

### GENERAL COMMENTS

PPP is weighted average of inter-country price ratios. The prerequisites for PPP calculation for all participating countries are as follows: (a) a set of authenticated prices of items grouped into basic headings (BHs), and (b) a set of BH level expenditure on GDP. The expenditure is used as weights. There are many methods for computing PPP, each differing from the other in the way ratios are formed and weights are applied.

The following are some desirable characteristics of a formula:

1. **Transitivity:** a comparison between A and B, and A and C should yield an indirect comparison between B and C, which is equal to a direct comparison between B and C;
2. **Base country-invariance:** relationship between any two countries should remain the same regardless of the base country chosen;
3. **Characteristicity:** the results should be characteristic of the pair of countries being compared. The effect of a third country should be minimal;
4. **Additive consistency:** PPP-derived real values of components should add up to totals.

Not all formulas have all the features, and each has its strength and weakness. So, a choice has to be made.

There are two classes of formulas as follows:

1. **Binary**, where countries are compared one pair at a time and the existence of a third country will not affect the results of the pair;

2. **Multilateral**, where all the countries in the group are compared simultaneously, so a third country will affect comparison between any pair of countries.

Regional PPPs are computed in two stages as follows:

Stage 1: For BHs, aggregating the individual item price ratios, which do not have expenditure weights;

Stage 2: For higher levels of aggregation including GDP, aggregating the basic heading PPPs computed in stage 1, weighted by their respective GDP expenditures.

Regional PPPs are linked to globally consistent PPPs in terms of a global currency in a separate exercise called “ring” comparison, which is explained in this annex.

### BASIC HEADING LEVEL PPPs

#### (a) Geometric mean

The simplest method of computing BH level PPP is the geometric mean. Divide all available prices by the respective prices of the base country to obtain item level price ratios. Then compute the geometric mean of all available price ratios. If there are  $m$  price ratios, multiply them all and obtain the  $m^{th}$  root.

$$(1) \quad ppp_{jk} = GM_{jk} = \left[ \prod_{i=1}^{i=m} \frac{p_{ji}}{p_{ki}} \right]^{1/m} \quad i=1,2,\dots,m; p_{ji} \neq 0, p_{ki} \neq 0$$



Where:

$P_{ij}$  = price of item  $i$  in country  $j$

$p_{ik}$  = price of item  $i$  in country  $k$

$ppp_{jk}$  = ppp for  $j^{th}$  country with respect to base country  $k$ .

Note that ratios can be formed only for those items that have a match with the base country.

### (b) Laspeyres, Paasche and Fisher indices

There are no expenditure weights for individual products but, to reflect their importance within a BH, countries mark their representative items with asterisks (\*). If the PPP is to be computed with representative items only, then compute two different sets of price ratios: one for the representative items of the base country (need not be representative in the numerator country) and another for the representative items of the numerator country (need not be representative in the base country). Then compute geometric means of the two sets. Since there is no clear-cut choice between the two, compute a geometric mean of the two means to obtain what is analogous to Fisher ideal index. The formulas for computing those PPPs are as follows:

$$(2) \quad L^*_{jk} = \left[ \prod_{i=1}^{i=m} \frac{P_{ij}}{p^*_{ik}} \right]^{1/m}$$

$$(3) \quad S^*_{jk} = \left[ \prod_{i=1}^{i=m} \frac{p^*_{ij}}{P_{ik}} \right]^{1/m}$$

$$(4) \quad ppp^*_{jk} = F^*_{jk} = \sqrt{L^*_{jk} \times S^*_{jk}}$$

Where:  $p^{*ik}$  = price of representative item  $i$  in the base country  $k$

$p^{*ij}$  = price of representative item  $i$  in the numerator country  $j$

$L^{*jk}$  = Laspeyres (asterisk) price index of country  $j$  with respect to country  $k$

$S^{*jk}$  = Paasche (asterisk) price index for country  $j$  with respect to country  $k$

$F^{*jk}$  = Fisher (asterisk) price index for country  $j$  with respect to country  $k$

$ppp^*_{jk}$  = PPP (asterisk) for country  $j$  with respect to country  $k$ .

Those indices differ from the classical

definition of Laspeyres, Paasche and Fisher, which involves weights and will be discussed in the paragraph on PPP for higher levels of aggregation. To distinguish special indices from the classical ones, they have been marked with asterisks (\*).

All the above indices are binary, as they compare two countries at a time. They are not necessarily transitive and, in a multilateral sense, are not base country-invariant (although bilateral Fisher indices are base country-invariant).

### (c) The EKS method

As ICP compares a number of countries at a time, it needs indices that are transitive and base country-invariant. The binary indices can be transformed into multilateral, transitive and base country-invariant indices by the EKS method.

An EKS index of a country  $j$ , relative to country  $k$  (within a comparison of  $n$  countries), is the geometric mean of two direct binary indices between  $j$  and  $k$  and all the indirect indices that can be computed from the rest of the  $n-2$  countries. Since it is a multilateral index, the existence of a third country will affect the index between pairs of countries, but the EKS method attempts to keep that influence to a minimum - EKS method minimizes the sum of squared deviations (in logarithmic terms, the original binary indices from their multilateral EKS counterparts). Equation (5) uses Fisher binary indices while equation (6) uses geometric means.

$$(5) \quad EKS^*_{jk} = \left[ F^{*2}_{jk} = \prod_{l=1}^n \frac{F^*_{jl}}{F^*_{kl}} \right]^{1/n} \quad \text{for } l \neq j, k$$

Where:

$F^{*jk}$  = Fisher price index for country  $j$  relative to country  $k$

$F^{*jl}$  = Fisher price index for country  $j$  relative to country  $l$

$F^{*kl}$  = Fisher price index for country  $k$  relative to country  $l$

$EKS^*$  = EKS index when working with starred or representative items only.

When bilateral indices are formed with all items, whether star marked (representative) or not, the Fisher indices can be replaced by geometric means of all price ratios.

$$(6) \quad EKS_{jk} = \left[ GM^2_{jk} = \prod_{l=1}^n \frac{GM_{jl}}{GM_{kl}} \right]^{1/n} \quad \text{for } l \neq j, k$$

Where:

$GM$  = geometric mean of all available price ratios, star marked or not

$EKS$  = (without the star) is EKS from geometric means rather than Fisher indices.

#### (d) The country product dummy (CPD) method

The CPD is a regression method, which delivers transitive and base country-invariant indices. Natural price logs are expressed as functions of two sets of dummy variables, one set for countries and another for products. A country dummy takes the value of 1 when the country matches otherwise zero. Similarly for a product dummy - it takes the value of 1 when the product matches otherwise zero. The base country dummy is dropped in a regression equation. The exponent of the coefficient of the country dummy is its PPP with respect to the base country. The exponent of the coefficient of the product dummy is its average international price calculated in base country currency. Unlike EKS\* method, CPD approach does not discard any price as long as it is submitted by at least two countries.

$$(7) \quad \ln p_{ij} = \sum \alpha_j C_{ij} + \sum \beta_i P_{ij} + \varepsilon_{ij}$$

Where:

$i = 1, 2, \dots, m$  product;  $j = 1, 2, \dots, n$  country

$\alpha_1 = 0$ ,  $C_{i1}$  are dropped from the equation because country 1 is the base country

$\ln p_{ij}$  is the natural logarithm of price of product  $i$  of country  $j$ ;  $C_{ij}$  is country dummy and  $P_{ij}$  is product dummy, which take the value of 1 for the price

of item  $i$  of country  $j$ , otherwise zero  $\varepsilon_{ij}$  is an error term

$PPP_{j/1} = \text{Exp}(\alpha_j)$  - PPP of country  $j$  over base country 1 is the exponent of the coefficient of the  $j^{\text{th}}$  country dummy  $\text{Exp}(\beta_i)$  - the exponent of the coefficient of the  $i^{\text{th}}$  product dummy is average international price calculated in base country currency.

If one country has more observations than another, the first country will unduly influence the PPP. To equalize the differences in frequency of response, one could weight the observations by the reciprocal number of observations.

Another version of the CPD, which introduces a dummy variable for representativeness of an item, is called country product representativity dummy or CPRD method. That extra variable generally improves the fit of the regression.

$$(8) \quad \ln p_{ij} = \sum \alpha_j C_{ij} + \sum \beta_i P_{ij} + \gamma R_{ij} + \varepsilon_{ij}$$

Where:

$R_{ij}$  is the dummy for representativity of items and takes the value of 1 when the item  $i$  in country  $j$  is representative and zero otherwise. All other variables are the same as in equation (7).

#### PPP FOR HIGHER LEVELS OF AGGREGATION

Depending on the method chosen, aggregation at higher levels may be conducted for GDP as a whole or for specific sub-aggregates, such as consumption, food or services, one at a time or simultaneously. It is necessary to have a complete matrix of basic heading level PPP denominated in the regional currency and an expenditure matrix of equal dimension in local currency units.

There are many competing methods. However, only two of them are used broadly in ICP: the EKS (also used in basic heading PPP calculations) and the GK.

**(a) The EKS index**

As seen before, the EKS index is a multilateral index based on a set of binary comparisons between all pairs of countries in the group. The binaries are made transitive and base country-invariant by obtaining a geometric mean of all direct and indirect bilateral indices. Each kind of bilateral indices can be used in the EKS procedure but the Fisher index is of the classical type in which, as shown below, its two components, Laspeyres and Paasche indices, use expenditure weights associated with each BH.

**(b) Laspeyres, Paasche and Fisher price indices**

In those calculations, the inputs are BH level parities instead of item level prices, and expenditures for BH level instead of the indication of representativity (stars/asterisks). Between country  $j$  and base country  $k$ , the Laspeyres uses base country  $k$  expenditure weights, and the Paasche uses the denominator country  $j$  expenditure weights:

$$(9) \text{ Laspeyres price index (arithmetic mean)} \quad L_{jk} = \frac{\sum_{i=1}^m \left( \frac{PPP_{ij}}{PPP_{ik}} \right) e_{ik}}{\sum_{i=1}^m e_{ik}}$$

$$(10) \text{ Paasche price index (harmonic mean)} \quad S_{jk} = \frac{\sum_{i=1}^m e_{ij}}{\sum_{i=1}^m e_{ij} / \left( \frac{PPP_{ij}}{PPP_{ik}} \right)}$$

The Fisher ideal index is the geometric mean of Laspeyres and Paasche indices for any pair of countries  $j$  and  $k$ :

$$(11) \quad F_{jk} = \sqrt{L_{jk} \cdot S_{jk}}$$

Where for all basic headings  $i = 1, 2, \dots, m$ ,

$PPP_{ik}$  = PPP of basic heading  $i$  in base country  $k$

$PPP_{ij}$  = PPP of basic heading  $i$  in numerator country  $j$

$e_{ik}$  = expenditure weight of basic heading  $i$  in base country  $k$

$e_{ij}$  = expenditure weight of basic head-

ing  $i$  in numerator country  $j$

$m$  = total number of basic headings

$L_{jk}$  = Laspeyres or base country weighted price index for  $j$  with respect to  $k$

$S_{jk}$  = Paasche or numerator country weighted price index for  $j$  with respect to  $k$

$F_{jk}$  = Fisher ideal price index for country  $j$  with respect to country  $k$ .

The EKS computes PPPs for one aggregate only at a time. It is most characteristic of the countries being compared (i.e., least affected by third countries) but it lacks additive consistency, i.e., the PPP-converted values of components may not add up to totals.

**(c) The Geary-Khamis index**

The Geary-Khamis or GK index is a multilateral index. Like EKS, it is also transitive and base country-invariant. However, while the EKS computes PPP for GDP and its various sub-aggregates separately, GK computes them simultaneously. GK computes a single set of average international prices and values the implicit quantities of all countries at the single set of international prices denominated in a base currency. For any aggregate - GDP, consumption, services or other - PPP is the ratio of domestic currency expenditure to the corresponding expenditure in international prices. GK is additively consistent, meaning components add up to totals. However, GK estimates of real values for poorer and smaller countries (more precisely, for the countries' prices, which have lower similarity with the single set of international prices) tend to be higher than those in EKS - so called, Gerschenkron effect.

The international price of a basic heading is quantity weighted average of the PPPs after they have been made commensurate with each other by converting them into the base currency by respective overall PPPs. The overall PPP of a country is the ratio of its total GDP expenditure in national currency to the

corresponding expenditure at international prices.

In that system, international prices  $\Pi$  are required to estimate PPP and PPP to estimate  $\Pi$ . Thus it is a system of simultaneous equations. Though the system as written consists of  $(n+m)$  equations in  $(n+m)$  unknowns ( $m$  basic headings,  $n$  countries), one is redundant (because the PPP of the base country is set equal to 1.0), and the system of equations is homogenous (for any country, quantities valued at international prices equal total national currency expenditure deflated by its PPP). In that method, average “international prices” of  $m$  basic headings, denominated in a base currency, and PPPs for  $(n-1)$  countries are computed simultaneously. That requires solving the system of simultaneous equations (14) and (15):

Start with the identities:  $E = PPP \times Q$ , or  $Q = E/PPP$ , where  $E$ ,  $PPP$  and  $Q$  are matrices of expenditures, PPPs and notional quantities respectively (see equation 13), all of the same dimension,  $m$  by  $n$ ,  $m$  being the number of basic headings and  $n$  the number of countries.  $Q$  is calculated by dividing expenditure by PPP, element by element (equation 13). It is called “notional” because the quantities are derived indirectly and are not observable.

Define

$$(12) \quad E = \{e_{ij}\}, PPP = \{ppp_{ij}\}, Q = \{q_{ij}\}, i = 1, 2, \dots, m; j = 1, 2, \dots, n \text{ and}$$

$$(13) \quad Q = E / PPP; q_{ij} = e_{ij} / ppp_{ij}$$

$$(14) \quad PPP_j = \frac{\sum_{i=1}^m e_{ij}}{\sum_{i=1}^m ppp_{ij} q_{ij}} = \frac{\sum_{i=1}^m e_{ij}}{\sum_{i=1}^m \Pi_i q_{ij}}; i = 1, 2, \dots, m; j = 1, 2, \dots, n-1$$

$$(14a) \quad PPP_n \equiv 1.0. \text{ The } n^{\text{th}} \text{ country is the base; its PPP is set at 1.0.}$$

$$(15) \quad \Pi_i = \sum_{j=1}^m \frac{ppp_{ij}}{PPP_j} \left[ \frac{q_{ij}}{\sum_{j=1}^m q_{ij}} \right] = \sum_{j=1}^m \left[ \frac{e_{ij} / PPP_j}{\sum_{j=1}^m q_{ij}} \right]; i = 1, 2, \dots, m; j = 1, 2, \dots, n.$$

Where:

$\Pi_i$  = is average international price of item  $i$

$ppp_{ij}$  = ppp for basic heading  $i$  in country  $j$   
 $q_{ij}$  = notional quantity of a basic heading  $i$   
 in country  $j$   
 $PPP_j$  = overall purchasing power parity of  
 country  $j$   
 $m$  = number of basic headings  
 $n$  = number of countries

Once a matrix of quantities valued at international prices is established, the PPP of any set of BHs is computed by using equation (14), the ratio between its national currency expenditure and the expenditure in international prices.

### COMPUTATION OF PPP FOR “RING” COMPARISON

The purpose of “ring” comparison is to link all regional results, expressed in regional numeraire currencies, into a globally consistent set and express it in terms of a single global numeraire currency, the US dollar. The mechanism consists of the following:

- ▶ Select a small number of representative countries from each region to form a ring with which to bind the regions together and which can be considered as a special additional region (mini-world).
- ▶ Select a set of products, especially chosen to represent the ring countries.
- ▶ Collect prices of the ring list in special surveys.
- ▶ Compute inter-regional BH-PPPs in a special way described below, considering the regional ring countries as if they formed mini-regions
- ▶ Aggregate the inter-regional BH-PPPs by the use of regional total expenditure (in regional numeraires) to any chosen level, consumption or GDP.
- ▶ Apply the results (inter-regional aggregated PPPs) to convert regional results into a global result.

The process is subject to one condition called “fixity”. It means that the global results must maintain the relative positions

of countries that were established in their respective regional comparisons. That involves computing a scalar to be applied to all countries in the region to convert regional results into global.

Steps in the computation of ring PPPs:

- ▶ Convert prices of each ring country into regional numeraire currencies using regional PPPs at the BH level.
- ▶ For each region and for each item, take a geometric mean of the prices of the ring countries to obtain the sets of single average regional ring prices.
- ▶ Choose a base region (e.g., OECD with the US dollar as the base currency) and, using CPD (equation 8) compute BH level PPP for each region. The PPPs will be units of regional numeraire currencies per US dollar.
- ▶ Take the total real values of each region in regional numeraire currencies to be the regional weights for the respective BHs.
- ▶ Using EKS (equation 6) and with the regional real value weights, aggregate BH level inter-regional PPPs to any chosen aggregate level, say GDP, to obtain global PPPs between regions in terms of global currency.
- ▶ For each country, multiply the regional PPP, which is expressed as units of local currencies per regional currency by the global PPP expressed as units of regional currency per global currency, to obtain a PPP for local currency in terms of global currency.
- ▶ Use that PPP to convert local currency values to global currency in order to obtain a globally consistent set of real values.

That procedure, applied separately to each aggregate, maintains fixity horizontally across countries in the region, but not vertically across aggregates within a country. Only one scalar per region should be applied to all aggregates.





# Annex III

## PRODUCTIVITY ADJUSTMENT

### HEALTH, EDUCATION AND GOVERNMENT SERVICES – LABOR PRODUCTIVITY ADJUSTMENT

The compensation of government employees, used in the ICP to “price” government services, shows enormous variation between countries at different levels of development. Some of the variation is presumably due to differences in productivity. For example, in Western Asia, the price level for the compensation of employees in the government health sector of Kuwait was about 45 times higher than that of Egypt. If no productivity adjustments were made, economies such as Egypt, the Syrian Arab Republic or Yemen, would be seen as having per capita levels of real consumption of government services comparable to that of Kuwait, and even the level of real GDP would be affected for those countries.

To adjust government compensation for productivity, a Cobb-Douglas function was estimated using the equation shown below in its typical specification of constant returns to scale:

$$Y = cL^\alpha K^{1-\alpha}$$

where output ( $Y$ ) is a function of labor ( $L$ ) and the capital stock ( $K$ ), with labor and capital shares of ( $\alpha$ ) and ( $1-\alpha$ ), respectively.

The government production function is expressed as follows:

$$Y_G = cL_G^\alpha K_G^{1-\alpha}$$

Productivity is measured as output per worker,

$$\frac{Y_G}{L_G} = c \left( \frac{K_G}{L_G} \right)^{1-\alpha}$$

where gross domestic product ( $Y_G$ ) is a function of labor input in government sectors ( $L_G$ ) and the capital stock in government sectors ( $K_G$ ), and ( $c$ ) is a scale parameter that depends on the units of measurement.

Because the government-specific capital-labor ratio ( $K_G/L_G$ ) cannot be directly measured, the capital intensity of government in each economy was assumed to be proportional to the whole economy. Thus, ( $K/L$ ) needs to be estimated only for the whole economy.

The capital stock was estimated using the perpetual inventory method with geometric decline as follows:

$$K_{2005} = \sum_{t=1981}^{2005} \frac{I_t}{(1+.05)^{2005-t}}$$

where ( $I_t$ ) is investment in year ( $t$ ) and .05 is the depreciation rate.

With the estimate of the capital stock and data on labor force, labor productivity can be estimated iteratively from the identity,

$$\frac{Y}{L} = c \left( \frac{K}{L} \right)^{1-\alpha} = c \left( \frac{Y}{L} \cdot \frac{K}{Y} \right)^{1-\alpha}$$

Values of ( $\alpha$ ) in the range of 0.5 to 0.7 were used. Western Asia countries were divided into four groups: low income countries with  $\alpha=0.5$ , middle income countries with  $\alpha=0.6$ , high income countries with  $\alpha=0.65$ , and very high income countries with  $\alpha=0.7$ . Capital-output ratios were assigned as 2.35 for low income countries, 2.5 for middle income countries, 3.0 for high income countries and 3.5 for very high income countries.

- The effect of productivity adjustment is to decrease the difference in compensation level between countries. For example, after adjustment, the price level for the compensation of employees in the government health sector of Kuwait is about 15 times higher than that of Egypt, while it was 45 times higher without adjustment.





# Annex IV

## CONSTRUCTION

### **WESTERN ASIA CONSTRUCTION COMPARISON WITH THE BASKET OF CONSTRUCTION COMPONENTS APPROACH**

The basket of construction components (BOCC) approach was used for construction cost comparisons. The BOCC was introduced in the current round as part of the general effort to address long-standing methodological problems, with the objective of improving the quality of the ICP data. Following the ICP practice, the BOCC approach divides the construction industry into three broad sectors: residential, non-residential and civil engineering. Each sector is divided into several standard systems. For example, the residential sector is divided into eight construction systems: site work, substructure, superstructure, exterior shell, interior partitions, interior/exterior finishes, mechanical and plumbing, and electrical work. Each system is further broken down into well-defined building blocks or construction components. Examples of construction components under the superstructure system include: structural column round, structural column square, concrete, reinforcing steel, plywood, skilled and unskilled labor. The approach entails pricing a well-defined set of standard construction components for each system, which form the basis for comparison.

The BOCC approach was developed through an extensive study of construction means, methods and materials in a global context. A conceptual evaluation was completed in 2002, and pointed to

the need to consider new methods for the sector. Consequently, in 2004, a series of visits were made to a number of countries to observe construction practices and assess data availability and collection capacity. Western Asia countries were particularly important in that effort. Direct visits were made to Egypt, Jordan and Kuwait, where the construction industry sector was found to be varied and dynamic, and a number of specific construction components were identified and details obtained.

For each construction component, a structured data collection form was produced following the ICP standard structured product description (SPD) format. An SPD represents a checklist for price determining characteristics, which price collectors must use to identify the component for which they are collecting prices. The SPDs for each construction component provide basic details needed by construction estimators for the pricing of the component, including, as appropriate, dimensional information, material specifications, testing requirements, inclusions and exclusions and other data commonly found in a construction specification.

A set of standard SPDs was proposed and reviewed by construction experts in different regions, including Western Asia. The consultation and review process led to amendments and enhancements of some of the SPDs, subsequently leading to a final set of 34 SPDs for pricing. The price collection is performed by estimating labor and equipment hours



and material quantities, applying appropriate unit rates and summing up to a total price for the component.

Data were collected in 2006, and subsequently validation efforts were undertaken. The validation process consisted of evaluation of the data collected for internal and external consistency. Internal consistency refers to the ability of someone knowledgeable about construction to understand the process by which the prices were determined. That evaluation included assessment of the consistency of unit rates used for the same material in different SPDs, consistency of labor unit rates, and so on, and thus relied on a detailed study of the results provided by a single country. It was done by national construction experts and passed on to Western Asia for further analysis. Further validation was conducted by international experts.

External consistency refers to the comparison of critical ratios (such as productivity and material cost ratios) across similar regions, and thus relied on comparison across countries within a given region. The process was conducted at the regional and global levels and was particularly useful in the validation efforts.

For the Western Asia data, the validation was completed in rounds. The initial validation process aimed at validating the overall data collection and quality control practices, and helped in highlighting areas for additional work. The process revealed that in some cases, unit prices for materials were showing unexpected variations between various

SPDs, and allowed countries within the region to make additional quality control efforts. The second round of validation involved more complete evaluation procedures relying on a wider range of quality tests. Because the responding countries provide information about the derivation of the price of the component, it was possible to calculate imputed productivity rates from the data and prepare relative cost ratios for critical materials, labor and equipment rentals. For example, if the labor to material ratio for a given country for a specific component is out of line compared to the corresponding ratio for the region as a whole, the component was flagged for further validation. After three rounds of data cleaning and validation, the results were deemed reasonably robust.

Once the data were collected and validated, PPPs were calculated using those data, including both construction industry-specific values and incorporation of construction into the overall economy values. The process requires rolling up from the 34 components to the respective systems to obtain PPPs for systems. PPPs for systems are then rolled up using system weights to compute PPPs for the three construction projects (i.e., residential buildings, non-residential buildings and civil engineering works). Those were in turn aggregated to calculate PPPs for the construction sector.





# Annex V

## HOUSING

For most BHs in the comparison, it is possible to derive the PPP based on the prices of items for the BH. That is the direct price approach. When countries have regular rental surveys, the price approach can be used for rented housing and rental equivalence for owner-occupied housing. PPPs are calculated from already existing statistics drawn from comprehensive rent surveys. With that approach, the dwellings have to be specified broadly because the basic information in the rent surveys will vary between countries with regard to the types of dwellings covered. It is to be noted that the direct price approach should only be used when rents actually paid can be considered representative of the entire stock of dwellings (i.e., of both rented and owner-occupied dwellings).

When rental data is not available, direct quantity comparisons are made instead. In the quantity method, volume relatives are calculated by comparing the volume of dwellings in each country. PPPs are derived indirectly by dividing volume relatives (ratios of the volumes of dwelling services in each country) into value relatives (ratios of expenditure on dwelling services in each country).

In Western Asia, a combination of both approaches was used to derive housing PPPs. Rental data was supplemented with physical quantity indicators to come up with an average PPP for every country.

Rental data were collected from the comprehensive rental surveys that countries conduct as part of their CPI programs. UN-ESCWA and ICP Global Office developed a rental data questionnaire to obtain information on the average rent paid for

specific types of dwellings. Countries agreed that national dwelling stocks can be divided into three major types of dwellings:

1. Villa;
2. Two-bedroom apartment;
3. Typical/traditional Arab house.

All dwelling types were specified to have three amenities: electricity, running water and private toilet. Information was also collected on the weight of the three types of dwellings in the total national dwelling stock.

Two types of PPPs were computed from the information provided in the rental data questionnaire, a CPD-PPP and a weighted CPD-PPP.

The quantity approach uses both quantitative and qualitative data to construct a volume index.

To collect the quantitative indicators required for

- The quantitative data are, in order of preference: the useable surface of dwellings; the number of rooms; the number of dwellings. One or other of those quantities is taken as the quantity index.
- The qualitative data are the percentages of dwellings with facilities such as electricity, inside water supply and inside toilets. The percentages of dwellings with those various facilities are averaged to produce a quality index.
- The quantity index is multiplied by the quality index to obtain the volume index used to measure the relative volumes of dwelling services provided in each country.



the quantity approach, the ICP Global Office developed a questionnaire to obtain detailed data underlying the estimates in the national accounts for both rented dwellings and owner-occupied dwellings (i.e., imputed rent). The numbers of dwellings of each different type (detached houses, apartments and so forth), classified by size, region or locality (urban or rural), as well as the facilities available (electricity, running water and private toilet) were details of particular interest.

Responses by Western Asia countries to the housing questionnaire have facilitated a comparison of volume measures of housing adjusted for quality within the region. However, the data submissions have included many gaps that limited the richness of the comparison. A major shortfall in the Western Asia data was that the only volume measure available for all countries was the number of residences. Only a few countries provided numbers of rooms or areas in square meters.

The derived volume measures are then adjusted for quality. The main indicators of housing quality that have been collected were share of dwellings with electricity, water and inside toilet. Two quality measures have been considered:

1. Quality I measure is a geometric mean of the percentage of residences with water, electricity and inside toilet;
2. Quality II measure weights the combination of all three amenities, and gives space 1/3 the weight of amenities, based upon several studies of the relationship of rents to size and amenities of dwellings using hedonic regression models.

A PPP could be imputed using the real values of dwelling services in each country, adjusted for quality, and the total values of rents recorded in each country's national accounts. In Western Asia, two indirect PPPs were derived for each country; one computed with Quality I adjustment, the other with Quality II adjustment.

Thus, for each country, four PPPs were available:

1. Direct CPD-PPP;
2. Direct weighted CPD-PPP;
3. Indirect Quality I measure-PPP;
4. Indirect Quality II measure-PPP.

For each country in the region, a geometric mean of the four PPPs was computed and considered the housing PPP for the country in question.

Table 1: Rental data questionnaire

Type of Dwelling	Country		Country II		Country III		Country IV	
	Average Yearly Rent	% Weight						
Villa								
Two-bedroom Apartment								
Typical/ Traditional Arab House								

Table 2: Quantity and Quality Indicators Questionnaire  
FORM A ICP Dwelling Services Questionnaires: Total Housing

Volume of Housing						
1	Reference Year for Benchmark					
2	Country					
		1. Total of all Dwellings	2. Type of Construction of Dwellings		3. Location of Dwellings	
			a. Modern Construction	b. Traditional	a. Size of Urban Area	b. Rural
			(1) Houses	(2) Flats	(1) Large	(2) Other
3	Number of Dwelling Units					
4	Number of Rooms					
5	Total Area in sqm of the Unit					
6	Percent of dwelling units with					
7	1 - 2 Rooms					
8	3 - 4 rooms					
9	5+ Rooms					
10	Percent of dwelling units with					
11	Electricity					
12	Inside water					
13	Private toilet					
14	Percent of dwelling units					
	Rented					
	Owner Occupied					
	Assumed growth rate from benchmark period to 2005					

*The derived volume measures are then adjusted for quality. The main indicators of housing quality that have been collected were share of dwellings with electricity, inside water and private toilet.*





# Annex VI

## REFERENCE PPPs

Reference PPPs are used for basic headings for which no prices were collected. They are based on PPPs calculated for other BHs. Ideally, the reference PPPs used for a BH would be those calculated for another BH with similar goods and services. For example, the reference PPP for motor cycles is the measured PPP for motor cars.

When it was impossible to use a reference PPP from similar goods or services, a “neutral” PPP was used instead. For example, the reference PPP used for Insurance was the measured PPP for final consumption expenditure by households.

In Western Asia, a total of 37 reference PPPs were used. The table below shows the total list..

Code	Description	Reference PPPs
100000	<b>GROSS DOMESTIC PRODUCT</b>	
110000	<b>FINAL CONSUMPTION EXPENDITURE BY HOUSEHOLDS</b>	
110100	<b>FOOD AND NON-ALCOHOLIC BEVERAGES</b>	
110110	<b>Food</b>	
110111	Bread and cereals	
110111.1	Rice	
110111.2	Other cereals, flour and other cereal products	
110111.3	Bread	
110111.4	Other bakery products	
110111.5	Pasta products	
110112	<b>Meat</b>	
110112.1	Beef and veal	
110112.3	Lamb, mutton and goat	
110112.4	Poultry	
110112.5	Other meats and meat preparations	
110113	<b>Fish</b>	
110113.1	Fresh, chilled or frozen fish and seafood	
110113.2	Preserved or processed fish and seafood	
110114	<b>Milk, cheese and eggs</b>	
110114.1	Fresh milk	
110114.2	Preserved milk and other milk products	
110114.3	Cheese	



Code	Description	Reference PPPs
110114.4	Eggs and egg-based products	
110115	<b>Oils and fats</b>	
110115.1	Butter and Margarine	
110115.3	Other edible oils and fats	
110116	<b>Fruit</b>	
110116.1	Fresh or chilled fruit	
110116.2	Frozen, preserved or processed fruit and fruit-based products	
110117	<b>Vegetables</b>	
110117.1	Fresh or chilled vegetables other than potatoes	
110117.2	Fresh or chilled potatoes	
110117.3	Frozen, preserved or processed vegetables and vegetable-based products	
110118	<b>Sugar, jam, honey, chocolate and confectionery</b>	
110118.1	Sugar	
110118.2	Jams, marmalades and honey	
110118.3	Confectionery, chocolate and ice cream	
110119	Food products n.e.c.	
110119.1	Food products n.e.c.	
110120	<b>Non-alcoholic beverages</b>	
110121	Coffee, tea and cocoa	
110121.1	Coffee, tea and cocoa	
110122	Mineral waters, soft drinks, fruit and vegetable juices	
110122.1	Mineral waters, soft drinks, fruit and vegetable juices	
110200	<b>ALCOHOLIC BEVERAGES, TOBACCO AND NARCOTICS</b>	
110210	<b>Alcoholic beverages</b>	
110211	Spirits	
110211.1	Spirits	
110212	Wine	
110212.1	Wine	
110213	Beer	
110213.1	Beer	
110220	<b>Tobacco</b>	
110221	Tobacco	
110221.1	Tobacco	
110300	<b>CLOTHING AND FOOTWEAR</b>	
110310	<b>Clothing</b>	
110311	Clothing materials, other articles of clothing and clothing accessories	
110311.1	Clothing materials, other articles of clothing and clothing accessories	
110312	Garments	
110312.1	Garments	
110314	Cleaning, repair and hire of clothing	
110314.1	Cleaning, repair and hire of clothing	
110320	<b>Footwear</b>	
110321	Shoes and other footwear	

Code	Description	Reference PPPs
110321.1	Shoes and other footwear	
110322	Repair and hire of footwear	
110322.1	Repair and hire of footwear	
110400	<b>HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS</b>	
110410	<b>Actual and imputed rentals for housing</b>	
110411	Actual and imputed rentals for housing	
110411.1	Actual and imputed rentals for housing	
110430	<b>Maintenance and repair of the dwelling</b>	
110431	Maintenance and repair of the dwelling	
110431.1	Maintenance and repair of the dwelling	
110440	<b>Water supply and miscellaneous services relating to the dwelling</b>	
110441	Water supply	
110441.1	Water supply	PPPs for household consumption (excluding reference PPPs basic headings)
110442	Miscellaneous services relating to the dwelling	
110442.1	Miscellaneous services relating to the dwelling	PPPs for household consumption (excluding reference PPPs basic headings)
110450	<b>Electricity, gas and other fuels</b>	
110451	Electricity	
110451.1	Electricity	
110452	Gas	
110452.1	Gas	
110453	Other fuels	
110453.1	Other fuels	
110500	<b>FURNISHINGS, HOUSEHOLD EQUIPMENT AND ROUTINE MAINTENANCE OF THE HOUSE</b>	
110510	<b>Furniture and furnishings, carpets and other floor coverings</b>	
110511	Furniture and furnishings	
110511.1	Furniture and furnishings	
110512	Carpets and other floor coverings	
110512.1	Carpets and other floor coverings	
110513	Repair of furniture, furnishings and floor coverings	
110513.1	Repair of furniture, furnishings and floor coverings	Geometric mean of PPPs for cleaning, repair and hire of clothing; repair and hire of footwear; and maintenance and repair of the dwelling
110520	<b>Household textiles</b>	
110521	Household textiles	
110521.1	Household textiles	
110530	<b>Household appliances</b>	
110531	Major household appliances whether electric or not	
110531.1	Major household appliances whether electric or not	
110532	Small electric household appliances	
110532.1	Small electric household appliances	
110533	Repair of household appliances	

Code	Description	Reference PPPs
110533.1	Repair of household appliances	Geometric mean of PPPs for cleaning, repair and hire of clothing; repair and hire of footwear; and maintenance and repair of the dwelling
110540	<b>Glassware, tableware and household utensils</b>	
110541	Glassware, tableware and household utensils	
110541.1	Glassware, tableware and household utensils	
110550	<b>Tools and equipment for house and garden</b>	
110551	Major tools and equipment	
110551.1	Major tools and equipment	
110552	Small tools and miscellaneous accessories	
110552.1	Small tools and miscellaneous accessories	
110560	<b>Goods and services for routine household maintenance</b>	
110561	Non-durable household goods	
110561.1	Non-durable household goods	
110562	Domestic services and household services	
110562.1	Domestic services	
110562.2	Household services	PPPs for domestic services
110600	<b>HEALTH</b>	
110610	<b>Medical products, appliances and equipment</b>	
110611	Pharmaceutical products	
110611.1	Pharmaceutical products	
110612	Other medical products	
110612.1	Other medical products	
110613	Therapeutical appliances and equipment	
110613.1	Therapeutical appliances and equipment	
110620	<b>Out-patient services</b>	
110621	Medical Services	
110621.1	Medical Services	
110622	Dental services	
110622.1	Services of dentists	
110623	Paramedical services	
110623.1	Paramedical services	
110630	<b>Hospital services</b>	
110631	Hospital services	
110631.1	Hospital services	
110700	<b>TRANSPORT</b>	
110710	<b>Purchase of vehicles</b>	
110711	Motor cars	
110711.1	Motor cars	
110712	Motor cycles	
110712.1	Motor cycles	PPPs for motor cars
110713	Bicycles	
110713.1	Bicycles	
110714	Animal drawn vehicles	
110714.1	Animal drawn vehicles	PPPs for bicycles
110720	<b>Operation of personal transport equipment</b>	
110722	Fuels and lubricants for personal transport equipment	

Code	Description	Reference PPPs
110722.1	Fuels and lubricants for personal transport equipment	
110723	Maintenance and repair of personal transport equipment	
110723.1	Maintenance and repair of personal transport equipment	
110724	Other services in respect of personal transport equipment	
110724.1	Other services in respect of personal transport equipment	
110730	<b>Transport services</b>	
110731	Passenger transport by railway	
110731.1	Passenger transport by railway	PPPs for passenger transport by road
110732	Passenger transport by road	
110732.1	Passenger transport by road	
110733	Passenger transport by air	
110733.1	Passenger transport by air	
110734	Passenger transport by sea and inland waterway	
110734.1	Passenger transport by sea and inland waterway	Geometric mean of PPPs for passenger transport by road and passenger transport by air
110735	Combined passenger transport	
110735.1	Combined passenger transport	PPPs for passenger transport by road
110736	Other purchased transport services	
110736.1	Other purchased transport services	
110800	<b>COMMUNICATION</b>	
110810	<b>Postal services</b>	
110811	Postal services	
110811.1	Postal services	
110820	<b>Telephone and telefax equipment</b>	
110821	Telephone and telefax equipment	
110821.1	Telephone and telefax equipment	
110830	<b>Telephone and telefax services</b>	
110831	Telephone and telefax services	
110831.1	Telephone and telefax services	
110900	<b>RECREATION AND CULTURE</b>	
110910	<b>Audio-visual, photographic and information processing equipment</b>	
110911	Audio-visual, photographic and information processing equipment	
110911.1	Audio-visual, photographic and information processing equipment	
110914	Recording media	
110914.1	Recording media	
110915	Repair of audio-visual, photographic and information processing equipment	
110915.1	Repair of audio-visual, photographic and information processing equipment	
110920	<b>Other major durables for recreation and culture</b>	
110921	Major durables for outdoor and indoor recreation	
110921.1	Major durables for outdoor and indoor recreation	
110923	Maintenance and repair of other major durables for recreation and culture	
110923.1	Maintenance and repair of other major durables for recreation and culture	PPPs for repair of audio-visual, photographic and information processing equipment

Code	Description	Reference PPPs
110930	<b>Other recreational items and equipment, gardens and pets</b>	
110931	Other recreational items and equipment	
110931.1	Other recreational items and equipment	
110933	Gardens and pets	
110933.1	Gardens and pets	
110935	Veterinary and other services for pets	
110935.1	Veterinary and other services for pets	Geometric mean of PPPs for gardens and pets; medical services; and paramedical services
110940	<b>Recreational and cultural services</b>	
110941	Recreational and sporting services	
110941.1	Recreational and sporting services	
110942	Cultural services	
110942.1	Cultural services	
110943	Games of chance	
110943.1	Games of chance	PPPs for recreational and sporting services
110950	<b>Newspapers, books and stationery</b>	
110951	Newspapers, books and stationery	
110951.1	Newspapers, books and stationery	
110960	<b>Package holidays</b>	
110961	Package holidays	
110961.1	Package holidays	
111000	<b>EDUCATION</b>	
111010	<b>Education</b>	
111011	Education	
111011.1	Education	
111100	<b>RESTAURANTS AND HOTELS</b>	
111110	<b>Catering services</b>	
111111	Catering services	
111111.1	Catering services	
111120	<b>Accommodation services</b>	
111121	Accommodation services	
111121.1	Accommodation services	
111200	<b>MISCELLANEOUS GOODS AND SERVICES</b>	
111210	<b>Personal care</b>	
111211	Hairdressing salons and personal grooming establishments	
111211.1	Hairdressing salons and personal grooming establishments	
111212	Appliances, articles and products for personal care	
111212.1	Appliances, articles and products for personal care	
111230	<b>Personal effects n.e.c.</b>	
111231	Jewellery, clocks and watches	
111231.1	Jewellery, clocks and watches	
111232	Other personal effects	
111232.1	Other personal effects	
111240	<b>Social protection</b>	
111241	Social protection	
111241.1	Social protection	PPPs for household consumption

Code	Description	Reference PPPs
111250	<b>Insurance</b>	
111251	Insurance	
111251.1	Insurance	PPPs for household consumption (excluding reference PPPs basic headings)
111260	<b>Financial services n.e.c.</b>	
111261	FISIM	
111261.1	FISIM	PPPs for household consumption (excluding reference PPPs basic headings)
111262	Other financial services n.e.c.	
111262.1	Other financial services n.e.c.	PPPs for household consumption (excluding reference PPPs basic headings)
111270	<b>Other services n.e.c.</b>	
111271	Other services n.e.c.	
111271.1	Other services n.e.c.	PPPs for household consumption (excluding reference PPPs basic headings)
111300	<b>BALANCE OF EXPENDITURES OF RESIDENTS ABROAD AND EXPENDITURES OF NON – RESIDENTS ON THE ECONOMIC TERRITORY</b>	
111310	<b>BALANCE OF EXPENDITURES OF RESIDENTS ABROAD AND EXPENDITURES OF NON – RESIDENTS ON THE ECONOMIC TERRITORY</b>	
111311	<b>Balance of expenditures of residents abroad and expenditures of non-residents on the economic territory</b>	
111311.1	Balance of expenditures of residents abroad and expenditures of non-residents on the economic territory	Exchange rates
130000	<b>INDIVIDUAL CONSUMPTION EXPENDITURE BY GOVERNMENT</b>	
130200	<b>HEALTH</b>	
130220	<b>Production of health services</b>	
130221	Compensation of employees	
130221.1*	Compensation of employees	
130222	Intermediate consumption	
130222.1	Intermediate consumption	PPPs for household consumption (excluding reference PPPs basic headings)
130223	Gross operating surplus	
130223.1	Gross operating surplus	PPPs for gross fixed capital formation (excluding reference PPPs basic headings)
130224	Net taxes on production	
130224.1	Net taxes on production	PPPs for production of health services (excluding reference PPPs basic headings)
130225	Receipts from sales	
130225.1	Receipts from sales	PPPs for production of health services (excluding reference PPPs basic headings)
130400	<b>EDUCATION</b>	
130420	<b>Production of education services</b>	
130421	Compensation of employees	
130421.1	Compensation of employees	
130422	Intermediate consumption	
130422.1	Intermediate consumption	PPPs for household consumption (excluding reference PPPs basic headings)
130423	Gross operating surplus	

Code	Description	Reference PPPs
130423.1	Gross operating surplus	PPPs for gross fixed capital formation (excluding reference PPPs basic headings)
130424	Net taxes on production	
130424.1	Net taxes on production	PPPs for production of education services (excluding reference PPPs basic headings)
130425	Receipts from sales	
130425.1	Receipts from sales	PPPs for production of education services (excluding reference PPPs basic headings)
140000	<b>COLLECTIVE CONSUMPTION EXPENDITURE BY GOVERNMENT</b>	
140100	<b>COLLECTIVE SERVICES</b>	
140110	<b>Collective services</b>	
140111	Compensation of employees	
140111.1	Compensation of employees	
140112	Intermediate consumption	
140112.1	Intermediate consumption	PPPs for household consumption (excluding reference PPPs basic headings)
140113	Gross operating surplus	
140113.1	Gross operating surplus	PPPs for gross fixed capital formation (excluding reference PPPs basic headings)
140114	Net taxes on production	
140114.1	Net taxes on production	PPPs for collective services (excluding reference PPPs basic headings)
140115	Receipts from sales	
140115.1	Receipts from sales	PPPs for collective services (excluding reference PPPs basic headings)
150000	<b>EXPENDITURE ON GROSS FIXED CAPITAL FORMATION</b>	
150100	<b>MACHINERY AND EQUIPMENT</b>	
150110	<b>Metal products and equipment</b>	
150111	Fabricated metal products, except machinery and equipment	
150111.1	Fabricated metal products, except machinery and equipment	PPPs for metal products and equipment (excluding reference PPPs basic headings)
150112	General purpose machinery	
150112.1	General purpose machinery	
150113	Special purpose machinery	
150113.1	Special purpose machinery	
150114	Electrical and optical equipment	
150114.1	Electrical and optical equipment	
150115	Other manufactured goods n.e.c.	
150115.1	Other manufactured goods n.e.c.	PPPs for metal products and equipment (excluding reference PPPs basic headings)
150120	<b>Transport equipment</b>	
150121	Road transport equipment	
150121.1	Motor vehicles, trailers and semi-trailers	
150121.2	Other road transport	PPPs for motor vehicles, trailers and semi-trailers
150122	Other transport equipment	
150122.1	Other transport equipment	PPPs for motor vehicles, trailers and semi-trailers

Code	Description	Reference PPPs
150200	<b>CONSTRUCTION</b>	
150210	<b>Residential buildings</b>	
150211	Residential buildings	
150211.1	Residential buildings	
150220	<b>Non-residential buildings</b>	
150221	Non-residential buildings	
150221.1	Non-residential buildings	
150230	<b>Civil engineering works</b>	
150231	Civil engineering works	
150231.1	Civil engineering works	
150300	<b>OTHER PRODUCTS</b>	
150310	<b>Other products</b>	
150311	Other products	
150311.1	Other products	
160000	<b>CHANGES IN INVENTORIES AND ACQUISITIONS LESS DISPOSALS OF VALUABLES</b>	
160100	<b>CHANGES IN INVENTORIES AND ACQUISITIONS LESS DISPOSALS OF VALUABLES</b>	
160110	<b>Changes in inventories and acquisitions less disposals of valuables</b>	
160111	Changes in inventories and acquisitions less disposals of valuables	
160111.1	Changes in inventories and acquisitions less disposals of valuables	Geometric mean of PPPs for durable goods basic headings (110511.1, 110531.1, 110532.1, 110551.1, 110552.1, 110613.1, 110711.1, 110713.1, 110821.1, 110911.1, 110914.1, 110921.1, 110931.1, 111231.1, 150112.1, 150113.1, 150114.1, 150121.1)
170000	<b>BALANCE OF EXPORTS AND IMPORTS</b>	
170100	<b>BALANCE OF EXPORTS AND IMPORTS</b>	
170110	<b>Balance of exports and imports</b>	
170111	Balance of exports and imports	
170111.1	Balance of exports and imports	Exchange rates



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**PPP AGGREGATIONS ACROSS AND ABOVE BASIC HEADINGS**

- Sensitivity of PPP-based Income Estimates to Choice of Aggregation Procedures (Y. Dikhanov)
- Aggregation methods on the basis of structural international prices (S. Sergueev)



# GLOSSARY

**Actual individual consumption** It is measured by the total value of household final consumption expenditure, nonprofit institutions (such as NGOs and charities) serving households' final consumption expenditure, and government expenditure on individual consumption of goods and services (such as education or health).

**Additivity** The values of the national accounts aggregates of countries participating in a comparison are equal to the sum of the values of their components when both aggregates and components are valued at current national prices. Additivity must be preserved when the values of the aggregates and their components are valued at international prices. An aggregation method is additive if, for each country being compared, it provides real values for basic headings that sum up to the real values of the aggregates of which they are components. An additive aggregation method provides volumes that satisfy the average test for volumes, but are subject to the Gerschenkron effect (see below).

**Aggregate** A set of transactions relating to a specified flow of goods and services in a given period, such as the total purchases made by resident households on consumer goods and services, the total expenditure by government on collective services or the total value of gross fixed capital formation. The term "aggregate" is also used to mean the value of the specified set of transactions.

**Aggregation** The procedure of computing PPPs above the basic heading level. The process of weighting, summing and averaging basic heading PPPs to obtain PPPs for each level of aggregation up to and including GDP.

**Balance of exports and imports** The free on board (FOB) value of exports of goods and services, less the FOB value of imports of goods and services. When no distinction between goods and services is required, it may be defined as the FOB value of exports of goods and services, less the cost, insurance and freight (CIF) value of imports of goods and services.

**Basic heading** The lowest level of aggregation of items in the GDP breakdown for which parities are calculated. In theory, a basic heading (BH) is defined as a group of similar well-defined goods or services. In practice, it is defined by the lowest level of final expenditure for which explicit expenditure weights can be estimated. Thus, an actual BH can cover a broader range of products than is theoretically desirable. BHs are the building blocks of a comparison. It is at the level of the BH that expenditures are defined, products selected, prices collected, prices edited and PPPs first calculated and averaged.

**Basket** A term often used for the common list of well-defined goods and services from which countries participating in a comparison make a selection of products to price for the purpose of compiling PPPs. Also referred to as "product list" or "item list."

**Bias** A systematic error in a PPP or volume index. Bias can arise for a number of reasons, including failure to respect either representativity, comparability or consistency; the price collection and measurement procedures followed; or the calculation and aggregation formula employed.

**Bilateral comparison** See "binary comparison."

**Binary comparison** A price or volume comparison be-



tween two countries that draws upon data only for those two countries. Also referred to as a “bilateral comparison.”

**Binary PPP** A PPP between two countries calculated using only the prices and weights for those two countries.

**Bridge country** A country that provides the link or bridge between two separate comparisons involving different groups of countries. The bridge country participates in both comparisons and, by doing so, enables the countries in one comparison to be compared with the countries in the other comparison and vice versa.

**Changes in inventories and valuables** (including work in progress) consist of changes in: (a) stocks of outputs that are still held by the units that produced them before being further processed, sold, delivered to other units or used in other ways; (b) 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; and (c) PPPs are not estimated directly; instead, they are imputed using PPPs for consumer goods equipment. Produced assets that are not used primarily for production or consumption, that are expected to appreciate (or at least not decline in real value), that do not deteriorate over time in normal conditions, and that are acquired and held primarily as stores of values.

**Characteristics** The physical and economic attributes of a product that serve to identify it and enable it to be located under some heading of a product classification; the technical parameters and price-determining properties of a product listed in a product specification.

**Clothing and footwear** include expenditures on clothing materials; garments

for men, women and children; other articles of clothing and clothing accessories; cleaning, repair and hire of clothing; all footwear for men, women and children; and repair and hire of footwear.

**COFOG (classification of the functions of government)** allows a range of transactions by general government—including outlays on final consumption expenditure, intermediate consumption, gross fixed capital formation and capital and current transfers—to be classified by function or purpose. A major use of COFOG is to identify which final consumption expenditures of general government benefit households individually and which benefit households collectively.

**COICOP (classification of individual consumption according to purpose)** classifies the individual consumption expenditures of three institutional sectors—households, NPISHs, and general government—by the ends they wish to achieve through those expenditures. Individual consumption expenditures are those made for the benefit of individual households. All final consumption expenditures by households and NPISHs are defined as individual, but only the final consumption expenditures by general government on individual services are treated as individual.

**Collective consumption expenditure by government** Expenditures incurred by general and local governments for collective consumption services such as defense, justice, general administration and the protection of the environment.

**Communication** includes expenditures on postal services and on telephone and telefax equipment and services.

**Comparability** requires participating countries to price products that are identical or, if not identical, equivalent. Pricing comparable products ensures that differences in product prices between countries reflect actual price

differences and are not influenced by differences in quality. Two or more products are comparable if either

- Their physical and economic characteristics are identical, or
- They are sufficiently similar that consumers are generally indifferent to the difference between them.

**Compensation of employees** All payments in cash and kind made by employers to employees in return for work done by them during the accounting period. Those payments comprise gross wages and salaries in cash and kind, employers actual social contributions and imputed social contributions.

**Component** A subset of goods and/or services that make up some defined aggregate.

**Consistency** The requirement that the prices collected by countries are consistent with the prices underlying their estimates of final expenditure on GDP. In most cases, they should be national annual purchasers' prices. As the basis of a comparison is the identity—expenditure = price multiplied by volume—and volumes are obtained by dividing expenditures by prices; using prices that do not correspond to those used to derive the expenditures will result in the volumes being either underestimated or overestimated.

**Construction** includes the construction of new structures and the renovation of existing structures. Structures include residential buildings, non-residential buildings and civil engineering works.

**Consumer durables** Durable goods acquired by households for final consumption (that is, those 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 a year or more.

**Consumption of fixed capital** Durable goods acquired by households for final con-

sumption (i.e., those 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 a year or more.

**CPD method (country product dummy method)** The multilateral method used by ICP to obtain transitive PPPs at the BH level through regression analysis. It treats the calculation of PPPs as a matter of statistical inference, an estimation problem rather than an index number problem. The underlying hypothesis is that, apart from random disturbance, the PPPs for individual products within a BH are all constant between any given pair of countries. In other words, it is assumed that the pattern of relative prices of the different products within a given BH is the same in all countries. It is also assumed that each country has its own overall price level for the BH and that overall price level fixes the levels of absolute prices of the products in the BH for the country. By treating the prices observed in the countries for the BH as random samples, the PPPs between each pair of countries and the common pattern of relative prices can be estimated using classical least-square methods. The method allows sampling errors to be estimated for the PPPs.

**Deflation** The division of the current value of some aggregate by a price index—described as a “deflator”—to value its quantities at the prices of the price reference period.

**ECP (European Comparison Program)** The ICP regional program for Europe carried out under the auspices of the United Nations Economic Commission for Europe. It is organized by Eurostat, the OECD, the Interstate Statistical Committee of the Commonwealth of Independent States, and the State Committee of the Russian Fed-

eration on Statistics.

**Education** includes expenditures by households on pre-primary, primary, secondary, postsecondary and tertiary education; also includes expenditures by government on education benefits and reimbursements and on production of education services..

**EKS (Ëltetö, Köves and Szulc)** method used to aggregate basic heading PPPs to obtain PPPs for each level of aggregation up to and including GDP. Strictly speaking, the EKS method is a procedure whereby any set of intransitive binary index numbers are made transitive. The procedure is independent of the method used to calculate the BH intransitive binary indices. Basically, the method used to obtain the intransitive binary PPPs for a BH or aggregate involves calculating first a matrix of Laspeyres-type PPPs, then a matrix of Paasche-type PPPs, and finally, by taking the geometric mean of the two, a matrix of Fisher-type PPPs. The Fisher-type PPPs are made transitive and multilateral by applying the EKS procedure, which involves replacing the Fisher-type PPP between each pair of countries by the geometric mean of itself squared and all the corresponding indirect Fisher-type PPPs between the pair obtained using the other countries as bridges. The resulting EKS-PPP provide real final expenditures that are not additive, nor are subject to the Gerschenkron effect. EKS results are considered to be better suited to comparisons across countries of the price and volume levels of individual aggregates.

**Error** The difference between the observed value of a PPP or volume index and its “true” value. Errors may be random or systematic. Random errors are generally referred to as “errors.” Systematic errors are called “biases.”

**Expenditure categories** The level of aggregation between main aggregates and expenditure groups.

**Expenditure weights** The shares of expen-

diture components in current-price GDP.

**Final consumption** consists of goods and services used up by individual households or the community to satisfy their individual or collective needs or wants.

**Final expenditure** consists of final consumption expenditure and gross fixed capital formation.

**Fisher-type PPP** The PPP for a BH or an aggregate between two countries that is defined as the geometric mean of the Laspeyres-type PPP and the Paasche-type PPP for the BH or the aggregate (see also “Laspeyres-type PPP” and “Paasche-type PPP” because their formulation depends on whether they are being used to calculate BH-PPPs or to aggregate BH-PPPs).

**Fixity** When results are calculated originally for a group of countries and later for a wider group of countries, the PPPs between the original group of countries shall nevertheless be preserved. Fixity is the convention whereby price and volume relativities between a group of countries that were established in a comparison covering just that group of countries remain unchanged, or fixed, when the countries of the group are included in comparisons with a wider group of countries. For example, price and volume relativities of the ICP regions and Eurostat-OECD remain unchanged in the global comparison.

**Food and non-alcoholic beverages** purchased for consumption at home; excludes food products and beverages sold for immediate consumption away from home by hotels, restaurants, cafés, bars, kiosks, street vendors, automatic vending machines and so forth; cooked dishes prepared by restaurants for consumption off their premises; cooked dishes prepared by catering contractors, whether collected by the customer or delivered to the customer’s home; and products sold specifically as pet foods.

**Furnishings, household equipment and household maintenance** includes expenditures on furniture and furnishings; carpets and other floor coverings; household textiles; appliances; glassware, tableware and household utensils; tools and equipment for house and garden; and goods and services for routine household maintenance.

**GDP** Gross domestic product, expenditure-based, is total final expenditures at purchasers prices, including the FOB value of exports of goods and services, less the FOB value of imports of goods and services.

**General government** The institutional sector that consists of central, regional, state and local government units, together with social security funds imposed and controlled by those units. It includes non-profit institutions engaged in non-market production that are controlled and mainly financed by government units or social security funds. Also referred to as “government.”

**Gerschenkron effect** Applicable only to aggregation methods that use either a reference price structure (i.e., each country’s quantities are valued by a uniform set of prices) or a reference volume structure (i.e., each country’s prices are used to value a uniform set of quantities) to compare countries. For methods employing a reference price structure, a country’s share of total GDP (i.e., the total for the group of countries being compared) will rise as the reference price structure becomes less characteristic of its own price structure. For methods employing a reference volume structure, a country’s share of total GDP will fall as the reference volume structure becomes less characteristic of its own volume structure. The Gerschenkron effect arises because of the negative correlation between prices and volumes.

**GK (Geary-Khamis) method** An average-price method to compute 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 countries after they have been converted into a common currency with PPPs and weighted by quantities. The PPPs are obtained by averaging within participating countries 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. The GK method produces PPPs that are transitive and real final expenditures that are additive. It has a number of disadvantages. One is that a change in the composition of the group can change significantly the international prices, as well as the relationships between countries. Another is that the real final expenditures are subject to the Gerschenkron effect, which can be large. GK results are considered to be better suited to the analysis of price and volume structures across countries.

**Goods** Physical objects for which a demand exists, over which ownership rights can be established and whose ownership can be transferred from one institutional unit to another by engaging in transactions on the market. They are in demand because they may be used to satisfy the needs or wants of households or the community or to produce other goods or services.

**Government final consumption expenditure** Expenditure, including imputed expenditure, incurred by general government on both individual consumption goods and services and collective consumption services.

**Gross fixed capital formation** Measured by the total value of a producer’s acquisitions, less disposals, of fixed assets during the accounting period, plus certain additions to the value of non-

produced assets (such as subsoil assets or major improvements in the quantity, quality, or productivity of land) realized by the productive activity of institutional units.

**Health** includes expenditures by households on medical products, appliances and equipment, outpatient services, and hospital services; also includes expenditures by government on health benefits and reimbursements and on production of health services.

**Household** A small group of persons who share the same living accommodation; who pool some, or all, of their income and wealth; and who consume certain types of goods and services collectively, mainly food and housing. A household can consist of only one person.

**Household final consumption expenditure** Expenditure, including imputed expenditure, incurred by resident households on individual consumption goods and services, including those sold at prices that are not economically significant.

**Housing, water, electricity, gas and other fuels** include expenditures on actual and imputed rentals for housing; maintenance and repair of the dwellings; water supply and services related to the dwellings; and electricity, gas and other fuels.

**ICP (International Comparison Program)** Started as a research project in the 1960s with the ultimate goal of establishing a regular program of worldwide PPP comparisons of GDP. Comparisons were organized for 1970, 1973, 1975, 1980, 1985 and 1993. They covered 10, 16, 34, 60, 64 and 83 countries, respectively. Responsibility for those comparisons was shared by the United Nations Statistics Division and the University of Pennsylvania. The World Bank is the current global coordinator of the ICP.

**Indirect comparison** A price or volume comparison between two countries made through a third country. For example,

in the case of countries A, B and C, the PPP between A and C is obtained by dividing the PPP between A and B by the PPP between C and B as follows:  
 $PPP_{A/C} = PPP_{A/B} / PPP_{C/B}$ .

**Individual consumption expenditure by government** The actual and imputed final consumption expenditure incurred by general government on individual goods and services.

**Individual consumption expenditure by households** The actual and imputed final consumption expenditure incurred by households on individual goods and services; also includes expenditure on individual goods and services sold at prices that are not economically significant. By definition, all final consumption expenditures of households are for the benefit of individual households and are individual. Also referred to as “final consumption expenditure of households” and “household final consumption expenditure.”

**Individual consumption expenditure by NPISHs** The actual and imputed final consumption expenditure incurred by NPISHs on individual goods and services. In practice, most final consumption expenditures of NPISHs are individual in nature, and so, for simplicity, all final consumption expenditures of NPISHs are treated by convention as individual. Also referred to as “final consumption expenditure of NPISHs” and “social transfers in kind.”

**Intermediate consumption** The value of the goods and services, other than fixed assets, that are used or consumed as inputs by a process of production.

**International dollars** PPPs at the global level for each economy are computed with the US dollar = 1.00, making it the numeraire currency. Those PPP conversion factors transform GDP and aggregates in national currency into a common world currency referred to as “real expenditures in the international dollar.” To remove the effect of the United States exchange rate, indices of real expenditure per

capita at the world average = 100 reflect the ratio of national real expenditures per capita to the world average real expenditures per capita.

**Machinery and equipment** includes fabricated metal products, general purpose machinery, special purpose machinery, electrical and optical equipment, transport equipment and other manufactured goods.

**Miscellaneous goods and services** include expenditures on personal care, personal effects, social protection, insurance and financial and other services.

**Multilateral comparison** A price or volume comparison of more than two countries simultaneously that produces consistent relations among all pairs of countries.

**Net exports** are the difference in value between the total exports and imports of an economy during a specific period of time.

**Net purchases from abroad** Purchases by resident households outside the economic territory of the country, less purchases by non-resident households in the economic territory of the country.

**NPISHs (non-profit institutions serving households)** Non-profit institutions that are not predominantly financed and controlled by government, whose main resources are voluntary contributions by households, and that provide goods or services to households free or at prices that are not economically significant.

**Numeiraire currency** The term used for the currency unit selected as 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 US dollar), but it can be an artificial currency unit developed for the purposes of PPP comparisons. The Hong Kong dollar is the numeraire currency for the Asia-Pacific region comparisons.

**Other products** include products of agri-

culture, forestry, fisheries and aquaculture, as well as software products.

**Per capita volumes** Standardized measures of 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 relation to a particular currency or as an index number.

**PLI (price level index)** for a basic heading is defined as the ratio of the basic heading PPP to the exchange rate. It is expressed as an index on a base of 100. A PLI of more than 100 means that when the national average prices are converted at exchange rates, the resulting prices within the basic heading tend to be higher, on average, than prices in the base country (or countries) of the region (and vice versa). At the GDP level, PLIs provide a measure of the differences in the general price levels of countries. They are also referred to as “comparative price levels (CPLs).”

**Product specification** A description or list of the characteristics that can be used to identify a product selected for pricing. Its purpose is to ensure that countries price comparable items. A product specification can be either brand- and model-specific (i.e., a specification in which a particular brand and model or a cluster of comparable brands – and possibly models – is stipulated) or generic (i.e., a specification where only the relevant price-determining and technical characteristics are given and no brand or cluster of brands is designated).

**Productivity adjustment** An adjustment made to the prices paid by non-market producers for labor, capital and intermediate inputs so that they correspond to a common level of multifactor productivity; in practice, an adjustment made to the prices (com-

pensation of employees) paid by non-market producers for labor so that they represent the same level of labor productivity.

**Products** Goods and services that are the result of production. They are exchanged and used for various purposes as inputs in the production of other goods and services, as final consumption, or for investment. Also referred to as “goods and services”, “commodities” or “items”.

**Purchaser’s price** Amount paid by the purchaser, excluding any deductible VAT or similar deductible tax, to take delivery of a unit of a good or service at the time and place required by the purchaser; the purchaser’s price of a good includes any transport charges paid separately by the purchaser to take delivery at the required time and place.

**PPP (purchasing power parity)** between two countries, A and B, is a price relative that measures the number of units of country A’s currency that are needed in country A to purchase the same quantity of an individual good or service as one unit of country B’s currency will purchase in country B.

**Real final expenditures** National final expenditures on GDP that have been converted to a common currency and valued at a uniform price level with PPPs. Expenditures so converted reflect only volume differences between countries. Also referred to as “real values.”

**Recreation and culture** includes expenditures on audiovisual, photographic, and information-processing equipment; other major durables for recreation and culture; other recreational items and equipment; garden and pets; recreational and cultural services; newspapers, books and stationery; and package holidays.

**Reference PPPs** are PPPs that are used for basic headings for which no prices are collected; they are based on prices collected for other basic headings.

**Representative product** is one that accounts for a significant share of the expenditures within a basic heading in the country in question.

**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.

**Restaurants and hotels** include food products and beverages sold for immediate consumption away from home by hotels, restaurants, cafés, bars, kiosks, street vendors, automatic vending machines and so forth; cooked dishes prepared by restaurants for consumption off their premises; cooked dishes prepared by catering contractors, whether collected by the customer or delivered to the customer’s home. Also includes expenditures on accommodation services provided by hotels and similar establishments.

**Seasonal products** Products for which both prices and quantities sold vary significantly throughout the year. Typically, the patterns of variation are repeated from one year to the next. Seasonal products vary from country to country.

**Services** Outputs produced to order and that 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. An exception to that rule is a group of industries, generally classified as service industries, some of whose outputs have characteristics of goods. Those industries are those concerned with the provision, storage, communication and dissemination of information, advice and entertainment in the broadest sense of those terms. The products of those industries, where ownership rights can be established, may be classified either as goods or services, depending on the medium by which the outputs are supplied.

**SNA (System of National Accounts, 1993)** A coherent, consistent, and integrated set of macroeconomic accounts, balance sheets and tables based on a set of internationally agreed-upon concepts, definitions, classifications and accounting rules.

**Taxes on production** Taxes on the goods and services produced as outputs by resident enterprises that become payable as a result of the production of those goods or services (i.e., taxes payable per unit of good or service produced, such as excise duties and non-deductible VAT), plus taxes that resident enterprises may pay as a consequence of engaging in production (taxes such as payroll taxes and taxes on motor vehicles). The former are called “taxes on products,” and the latter “other taxes on production”.

**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.”

**Transport** includes expenditures on purchase of vehicles, operation of personal transport equipment, and transport services.

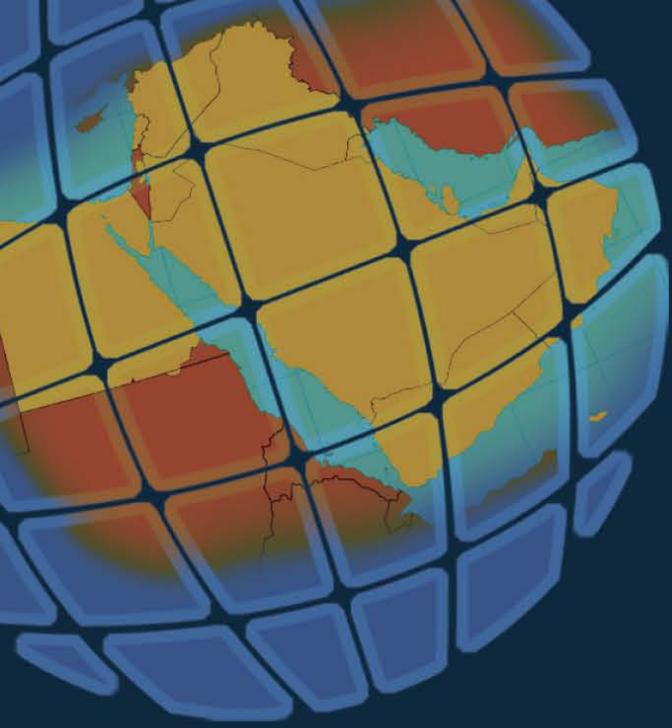
**VAT (value added tax)** A tax on products col-

lected in stages by enterprises. It is a wide-ranging tax usually designed to cover most or all goods and services. Producers are obliged to pay to government only the difference between the VAT on their sales and the VAT on their purchases for intermediate consumption or capital formation. VAT is not usually levied on exports (see also “deductible VAT” and “non-deductible VAT”).

**Volume measures** are 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. 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 GDP level, they are used to compare the economic size of countries. They may be presented either in relation to a particular currency or as an index number.







The International  
Comparison Program

