PART IV
Stories Behind Data—Using Price Data and Statistics to Track Socioeconomic Development
Overview

Price data and statistics serve a wide range of purposes for development practitioners and policymakers. In the case of the COVID-19 pandemic, data on fluctuations in prices of consumer goods and services, in particular costs for face masks, medical equipment, and medicines, helped authorities develop pandemic-related policies to ensure these essential items were kept affordable at a time when they were needed most.

As previously mentioned in this report, the Russian invasion of Ukraine further contributed to supply chain disruptions that emerged during the pandemic, pushing prices to levels not seen for decades. These inflationary pressures have caused an increased cost of living crisis, with the impacts being felt most amongst the extreme poor. In this difficult environment, price and inflation data are critical in helping policy makers formulate actions and interventions to minimize the adverse impacts of high inflation.

Irrespective of the pandemic, price data have always been an important source of information for policymakers. In Part II of the report, we noted how central banks regularly examine inflation data to keep track of price movements over time, which in turn, become the basis for inflation targets and the setting of interest rates. Spatial variations in prices of essential goods and services also inform policies regarding cost of living, minimum wages, and determination of poverty thresholds.

National statistical systems routinely collect data on prices and among various indices, the consumer price index (CPI) is one of the most commonly compiled development indicators. The CPI is designed to measure how prices of goods and services commonly consumed by households change over time. In addition to the CPI, government statisticians also compile other price indices, such as the producer price index (PPI), export and import price index, residential property price index, and others. The CPI and other indices track price movements temporally within an economy or a geographical area.

Another key price data gathering initiative across economies of the world is the International Comparison Program (ICP), one of the largest and longest-running statistical initiatives in the world (WBG 2021a). It measures price levels across economies and produces purchasing power parities (PPPs). PPPs are the ratio of prices in the national currency of a specific basket of goods and services in an economy to the cost of purchasing the same basket in a reference economy.

While the scope of the CPI is temporal price movements over time for household consumption expenditures within a single economy, the PPPs reflect spatial price indices across economies for the same time period, with their scope covering all main categories of gross domestic product including household consumption expenditures. The PPPs allow comparisons of price levels across economies and of ‘real’ gross domestic product and its components across economies by expressing these metrics in a common currency.
The ICP is a global partnership implemented under the auspices of the United Nations Statistical Commission (UNSC) with the World Bank leading the implementation of the program in collaboration with regional and international development partners and national statistical agencies. Since the 2005 ICP benchmark, the Asian Development Bank has led the implementation of ICP for Asia and the Pacific (ADB 2019). The UNSC has now made the ICP a permanent part of its global statistical program, highlighting its important role for policymaking (ADB 2020; WBG n.d.).

This chapter briefly describes the importance of price statistics in policymaking and turns its focus on the ICP, highlighting the importance of ICP in providing measures of comparisons of price levels and real sizes of economies across the world through a collaborative global partnership. It discusses the critical role of statistical agencies of the participating economies of the world in its implementation, and finally presents experiences of the 22 economies that participated in the implementation of the 2017 ICP in Asia and the Pacific and their efforts to integrate ICP implementation with the regular CPI price collection.

**How Are Price Data Used for Policymaking?**

**Data on movements in prices paid by consumers are an important resource for policymakers in formulating a wide array of programs for socioeconomic development.**

Inflation has deep impacts across an economy, including on consumer spending, business investment, job creation, government programs relating to tax policies, interest rates, and other areas (Andres and Hernando 1997; Barro 1995). In general, very low inflation can signal weakness in an economy and potential risk for deflation, while very high inflation can signal an overheated economy and the threat of uncontrolled price hikes if left unchecked. National authorities typically target moderate inflation levels ranging from 2% to 4%, to ensure prices are kept relatively stable and financial stability is maintained, while governments roll out programs to promote economic growth (Ball 1992).

The term inflation is typically used in reference to the consumer price index, or CPI, one of the indicators commonly used to track changes in cost of living. It includes headline CPI and core CPI, which are typically reported by government statistics offices. In general, the CPI captures temporal changes in prices paid for a market.

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1 Other agencies implementing the program at the regional levels are: African Development Bank (AfDB); Statistical Office of the European Communities (Eurostat); Organisation for Economic Co-operation and Development (OECD); Interstate Statistical Committee of the Commonwealth of Independent States (CIS-STAT); the United Nations Economic and Social Commission for Western Asia (UN-ESCWA); and United Nations Economic Commission for Latin America and the Caribbean (UN-ECLAC).

2 Box 4.1 presents a discussion of how cost of living is measured empirically.
basket of goods and services commonly consumed by households. The breakdown of items typically follows the categories of the Classification of Individual Consumption by Purpose (COICOP) developed by the United Nations Statistics Division (UN 2018). Core CPI excludes categories such as food and energy as these prices may be volatile or sensitive to factors outside the broader economy. Headline CPI captures all categories (IMF et al. 2020). CPI data is usually compiled monthly, highlighting the importance of it as a source of timely information on price movements for policymaking. Table 4.1, meanwhile, shows examples of specific policy uses of data derived from consumer price movements.

Table 4.1: Policy Uses of Data on Consumer Price Movements

<table>
<thead>
<tr>
<th>Use</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indexation of wage</td>
<td>One of the original rationales behind compilation of consumer price data was the need to link wage determination to a price index that captures cost of living.</td>
</tr>
<tr>
<td>Indexation of social security benefits</td>
<td>In a number of economies, it is a common practice to index the rates at which social security benefits (e.g., retirement pensions, unemployment benefits, sickness benefits, child allowances) are payable based on consumer price data.</td>
</tr>
<tr>
<td>Indexation of interest, rents, and other contractual payments</td>
<td>Payments for rents and interest are commonly indexed to the CPI. It is also possible for housing rent payments to be associated with the CPI or another index, like a house price index.</td>
</tr>
<tr>
<td>Taxation</td>
<td>Changes in CPI can impact tax payments in multiple ways. Tax laws can be modified to include some form of indexing.</td>
</tr>
<tr>
<td>Real consumption and real income</td>
<td>Price indices deflate expenses and income to obtain real consumption and income measures, which involve volume comparisons over time or space.</td>
</tr>
</tbody>
</table>


Box 4.1: How is the Cost of Living Measured?

Since the cost of living has a profound effect on people’s well-being it is important to collect data on it and assess the different impacts across demographic groups and how this can change over time (The Lancet Public Health 2022). National statistical systems, particularly national statistics offices, are at the forefront of collecting data on prices of goods and services used to estimate the cost of living in a specific economy.

The standard of living and cost of living are two interrelated economic concepts that are important when examining trends in quality of living. The standard of living is associated with quality of life, while cost of living represents the amount of money needed to support a specific standard of living (Latimaha, Ismail, and Bahari 2020).

At the individual level, standard of living may be quantified based on a person’s income, consumption, expenditures, employment and other economic opportunities, health, and education. For economy-wide indicators, gross domestic product per capita and the Human Development Index (HDI) are among the most commonly used aggregate measures (Bérenger and Verdier-Chouchane 2007).

To compile a consumer price index, most governments gather data to monitor changes in the prices of a basket of goods and services commonly consumed by households, usually based on weights derived from the economy household consumption expenditure surveys. The price data may also help determine the living wage or the minimum amount of money a family needs to meet their basic needs (IMF et al. 2020). At the global level, the International Comparison Program (ICP) collects data on prices for the purpose of compiling purchasing power parities (PPPs), price level indexes and PPP based measures of gross domestic product (GDP) expenditures for economies of the world.

(continued on next page)
**Box 4.1: How is the Cost of Living Measured? (continued)**

As shown in the table below, data on prices are also monitored by other research agencies and private institutions, such as the Economist Intelligence Unit (EIU), Numbeo, and Mercer, that each compile their own cost-of-living index for major cities of several world economies to help companies assess the appropriate level of compensation for employees residing in different cities across world. On the other hand, price level indexes for household consumption from the ICP provide a measure of costs of living across economies.

Across the indices in the table, there are variations in the list of specific goods and services included in calculations, while data collection and index compilation methods may also differ, which must be taken into account when comparing results from these different measures.

<table>
<thead>
<tr>
<th>Index</th>
<th>Data Collection Approach</th>
<th>Global Coverage</th>
<th>Frequency of update</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer Price Index</td>
<td>Prices collected to produce CPIs for 12 commodity groups and lower levels following COICOP classification.</td>
<td>National and subnational coverage</td>
<td>Usually, monthly</td>
</tr>
<tr>
<td>ICP’s Purchasing Power Parity and Price level Index</td>
<td>Participating economies collect and compile data on prices of a comparable basket of household and nonhousehold items, GDP expenditures, population estimates, and market exchange rates. Follows framework of System of National Accounts and related classifications. Economy-wide collection of prices from representative sample outlets in rural and urban areas.</td>
<td>176 economies in the latest 2017 ICP benchmark (19 economies from East Asia and the Pacific, 6 economies from Central Asia, and 7 economies from South Asia) Non-participating economies are imputed using regression models</td>
<td>Usually once in six years in the past. Latest 2017 ICP benchmark available. Extrapolation for years post benchmark by - World Development Indicators (WDI) Next ICP comparison is ongoing for reference year 2021</td>
</tr>
<tr>
<td>EIU’s Worldwide Cost of Living Index</td>
<td>Price data are collected from supermarkets, medium-priced retailers, and more expensive specialty shops. Compares more than 400 individual prices across more than 200 products and services.</td>
<td>172 cities (in 2022)</td>
<td>twice a year</td>
</tr>
<tr>
<td>Numbeo Cost of Living Index</td>
<td>Data collected from authoritative sources such as websites of supermarkets, taxi company websites, governmental institutions, newspaper articles, and other surveys</td>
<td>540 cities, 136 from Asia and the Pacific and includes indexes for cities and economy levels.</td>
<td>twice a year</td>
</tr>
<tr>
<td>Mercer Cost of Living Index</td>
<td>Evaluates more than 200 goods and services, highlights essential factors such as currency fluctuations, cost inflation, and accommodation price instability.</td>
<td>400 cities</td>
<td>twice a year</td>
</tr>
</tbody>
</table>

COICOP = Classification of Individual Consumption by Purpose, CPI = consumer price index, GDP = gross domestic product.

Notes: The information presented in this table corresponds to commonly used metrics for cost of living but does not constitute an exhaustive list.

Sources: Asian Development Bank summary based on information presented by International Labour Organization; International Comparison Program (ICP) – World Bank; The Economist Intelligence Unit (The EIU); Numbeo and Mercer (accessed 20 March 2023).
Among different measures presented in the Table that compare cost of living across cities and/or the economies of the world, Numbeo presents such indexes for a large number of economies of the world in addition to more than 500 major cities. Despite methodological differences of Numbeo's Cost of Living Index with ICP, it presents an opportunity to compare the economy level Cost of Living Index with the Price Level Indexes (PLIs) for household consumption expenditures from ICP. The Figure below plots the rankings of 112 economies common between Numbeo and the ICP database for the year 2017 – the latest benchmark year for which ICP comparisons are available. The rankings of economies are based on the Cost of Living Index for Numbeo and PLI for household consumption expenditures from the ICP for the year 2017. The higher the Cost of Living Index or the PLI, the higher the rank for the corresponding measure. In general, the Figure shows that rankings of several economies are clustered around the diagonal of the rectangle pointing to similarities in rankings, however, for many economies the rankings are quite different from the two measures. This could be because of differences in the composition of the goods and services, methods and sources of data, and more importantly the methods and weights used in aggregating product prices to an overall measure of cost of living.

Importantly, the latest cost of living index data from the main indices available annually, all point to a significant recent spike in the cost of living. For example, the EIU’s Worldwide Cost of Living Index for 2022 shows that, on average, prices in local-currency terms in the world’s biggest cities increased by 8.1% compared to 2021. This is the fastest rate observed since 2000, signaling a global cost-of-living crisis triggered by the Russian invasion of Ukraine and previous COVID-19 pandemic-related restrictions.
**Differences between producer and consumer prices provide insights into the evolution of global value chains over time.**

While Part III of this report discussed recent trends in global value chains, differences between CPI and PPI provide additional insights into the extent to which firms continue to scale up production and allocate their resources more efficiently through the shift of production chains across borders. While the basket for CPI includes goods and services commonly consumed by the average person, including imports, the PPI is calculated based on all outputs that domestic producers sell, including intermediate goods and services, but excluding imports. This means that the PPI measures the average cost for a producer and is often used to adjust revenue streams in order to measure output growth in real terms (Figure 4.1).

![Figure 4.1: Difference between CPI and PPI](image)

Source: Asian Development Bank visualization adopted from Box 3.1 of ADB’s *Key Indicators for Asia and the Pacific 2016*.

While it is commonly expected that trends in the PPI and CPI will vary due to differences in how they are composed and weighted, there is evidence that they moved in similar patterns until the 2000s. More recent data from Asia, however, shows diverging trends. Global value chains can provide an explanation for this growing divergence as companies now conduct different stages of production in different locations, making it less likely that producer and consumer prices will move together.

This is partly due to trade liberalization and technological advancements that have made it easier for companies to find locations with lower costs and better resources. As a result, there are an increasing numbers of imported consumer goods and services not included in the basket used to calculate PPI, which explains the weaker correlation between PPI and CPI movements. Nonetheless, this issue remains an important policy concern for some economies (Wei and Xie 2019).
The International Comparison Program (ICP)

The ICP is one of the largest and longest running global statistical initiatives, highlighting the importance of PPPs and related indicators in policy making.

Measurements for comparisons of incomes and standards of living across economies often rely on market exchange rates. However, this method of measurement does not capture differences in price levels and real incomes. To provide reliable measures of comparable price levels across economies, the International Comparison Program (ICP) was initiated in 1968. PPPs produced from ICP are used to convert GDP expenditures recorded in currencies of individual economies to a common currency and at the same time equalize the purchasing powers of different currencies by eliminating the differences in price levels across economies, thus providing real measures to compare economic size and per capita measures. The expenditure estimates expressed in PPP terms provide real comparisons across economies as the expenditures converted using exchange rates, do not take into account, price level differences across economies, and are also affected by fluctuations in exchange rates. Evolving over time, the ICP was established as a permanent global statistical program in 2016 by the United Nations Statistical Commission (UNSC) under the overall management of the World Bank. The ICP is implemented through a unique partnership of economies, regional agencies, and multilateral agencies, with a governance structure for coordinating the program at national, regional, and global levels.
The ICP started as a small research project in 1968, in collaboration with the United Nations Statistical Office and the International Comparisons Unit of the University of Pennsylvania, funded from several sources, including the Ford Foundation and the World Bank. The goal was to set up a regular program of global PPP-based comparisons of GDP. While the first comparisons from the research project involved just 10 economies, over time it has become one of the largest global statistical programs with 176 economies participating in the most recent 2017 benchmark cycle. (Figure 4.2).

**Over time ICP has continuously evolved and participation has expanded making it a truly global program.**

The need for real comparisons of income and expenditure aggregates across economies in the international context, and the limitations of using market exchange rates for comparing sizes of economies, led to the establishment of the ICP. Since its creation,
it has continuously improved by adopting new methodologies for PPP computations, strengthening its governance framework, and increasing geographic coverage to become truly global (Figure 4.3). ADB in its study (ADB 2020) provides a detailed history of the global comparisons and evolution of ICP since the early 20th century.

The earlier phases of ICP in the 1970s and 1980s saw extensive methodological developments with contributions from researchers at the University of Pennsylvania. As participation of economies increased in the 1980s, the ICP moved to the United Nations Statistical Office (now known as the United Nations Statistics Division), with ongoing technical advice from the University of Pennsylvania. Prior to 1985, the main use of PPPs from the ICP was for comparisons of real expenditures across economies. Starting with the 1985 ICP, PPPs for household consumption were used by World Bank researchers to develop an international poverty line which popularly became known as the dollar-a-day poverty line. This signaled the start of the use of PPPs from the ICP to calibrate the international poverty line to monitor absolute poverty in the world.

As discussed in Part I, the extreme poverty line is currently $2.15 which is based on the PPPs for household consumption from the latest available 2017 ICP cycle.

**Figure 4.3: ICP Through the Years**

1968
Launch of first ICP as a research project.
UNSD and the International Comparisons Unit of the University of Pennsylvania established the ICP as a program for PPP-based comparisons of GDP.

1970s
Conduct of first full-scale ICP covering Europe and North America. Three ICP Phases were conducted with benchmark years 1970, 1973, and 1975.

1980
Expansion of ICP coverage in Asia, Latin America, and Africa. The first regional comparisons in 1985 started the process toward regionalization of ICP.

1990
The International Comparison Project was renamed as the International Comparison Program.

1993*
Restructuring of ICP measurement to real output and PPP of different currencies. For the first time, all regions of the world were covered. Regional comparisons were conducted. However, no global comparisons were made.

2005
Greater expansion of ICP covering more economies and regions, including Asia and the Pacific, the Middle East, and Eastern Europe.
PRC’s first participation in ICP.

2010
Conduct of ICP covering 199 economies and providing new insights into the relative size and structure of different economies. Methodological changes introduced for linking regional PPPs to estimate global PPPs which established a firm ICP methodology.

2017
Latest conduct of ICP covering 176 economies and providing updated estimates of the size and structure of the global economy.
The first ICP cycle after its endorsement as a permanent element of the global statistical work program by the UNSC in 2016 and to be implemented every three years.

2021
Conduct of ICP comparison cycle activities for the reference year 2021 ongoing. Originally for 2020 reference year but postponed to 2021 due to the COVID-19 impact on the data collection activities.


* In 1990, The International Comparison Project was renamed as the International Comparison Program.

The 2005 ICP began a new era as the ICP became a fully global partnership with stakeholders at the national, regional, and global levels.

The 2005 ICP was a landmark round as it ushered in a new global governance framework to address the institutional, organizational, and operational issues that emerged in the 1990s with the program increasing coverage of economies across all regions of the world. In 2005, a governance structure was established to make ICP a fully global partnership with several regional organizations invited to function as regional implementing agencies. These are the African Development Bank, ADB, Interstate Statistical Committee of the Commonwealth of Independent States (CIS-STAT), United Nations Economic Commission for Latin America and the Caribbean, United Nations Economic and Social Commission for Western Asia and the Eurostat, and OECD. Their role is to coordinate the regional comparisons and produce regional PPPs. The ICP Global Office was established at the World Bank and was given the responsibility to coordinate the program across all regions and to undertake computations of global PPPs by linking the regional PPPs.

The ICP also seeks to maximize synergies between its own operations and the statistical programs of national agencies in areas of price collection and the compilation of national accounts statistics. In the 2005 ICP benchmark, the number of participating economies grew to 146, with the People's Republic of China participating for the first time. Operational guidelines for standardized implementation and methodologies for regional and global comparisons were developed to overcome shortcomings of earlier phases. In 2011 the ICP saw some critical methodological changes, including linking regional PPPs, computed by the regional implementing agencies, to enable computation of the global PPPs by the World Bank. The number of participating economies in 2011 reached its highest level at 199, the only ICP benchmark in which 20 Pacific Island economies participated, with the Australian Bureau of Statistics taking up the coordination role.3 With the methodologies firmly established, the 2017 ICP with 176 participating economies, saw no further changes and this allowed comparability of results with the 2011 ICP benchmark.

The International Comparison Program has become a permanent element of the global statistical program of the United Nations Statistical Commission.

Because of cost issues, ICP cycles have been implemented only for specific benchmark years. PPPs for nonbenchmark years have been conventionally estimated using extrapolation techniques. Recognizing the increasing demand from users for more frequent and reliable PPPs, the UNSC at its 47th Session in 2016 agreed to make the ICP a permanent element of the global statistical program, with benchmarks to be conducted over three-year cycles beginning with the 2017 ICP. However, due to the COVID-19

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3 The participation of 20 Pacific Island economies in the 2011 ICP was limited to household consumption only. Since the 2005 ICP cycle, Fiji has been a part of the Asia Pacific region of ICP, which is coordinated by ADB.
pandemic, the 2020 cycle was postponed with 2021 becoming the new reference year instead. The 2021 ICP cycle is ongoing, with the results expected to provide insights into the impact of the pandemic on price structures and real expenditures in economies.

The governance structure of the ICP is given in Figure 4.4. It comprises the ICP Governing Board, which provides strategic leadership and sets policies and priorities for the ICP, with representatives from 11 participating economies and the regional and international agencies involved in ICP implementation. The Inter-Agency Coordination Group (IACG), which comprises the regional implementing agencies from the ICP regions responsible for steering the regional program operations and calculating regional PPPs, and the World Bank as global coordinating agency responsible for linking regional results for computation of global PPPs. The national implementing agencies, who are typically the national statistics offices of participating economies in each region, play the most important role of collecting price survey, GDP expenditure and other data, and providing it to the implementing agencies compiling the regional PPPs. And lastly, the ICP Technical Advisory Group is an independent body of experts with the responsibility of ensuring the methodological soundness and quality of ICP results.

Figure 4.4: International Comparison Program Governance Structure


Source: Adapted from p. 83 of the Asian Development Bank 2017 International Comparison Program for Asia and the Pacific: Purchasing Power Parities and Real Expenditures.
Annual average prices for a basket of comparable and representative goods and services covering all GDP components and expenditures are used to calculate regional and global PPPs.

The computation of PPPs for GDP and its components is a data intensive exercise that is only possible as a result of the contributions of the national statistical agencies who collect the required input data. During an ICP benchmark year, participating economies in each region are required to provide specific data sets which include national annual average prices for a pre-defined basket of goods and services of household final consumption expenditures, government final consumption expenditures, gross fixed capital formation (including construction and machinery and equipment items), and gross domestic product expenditures (disaggregated into 155 subcomponents called basic headings), market exchange rates, and size of resident population (ADB 2020, WBG n.d.4).

The framework and scope of the ICP are defined by the System of National Accounts5 and hence the price surveys are designed to be consistent with national accounts practices. This implies that the prices of products selected for price surveys from the regional item basket should be representative of the goods and services in the final consumption and investments of GDP expenditures of each economy in the region. At the same time, the representativity of the products is to be balanced with comparability of products across all economies in the region and across all regions.

To ensure comparability across all economies within a region and across all regions of the world, standard product lists of items of (i) household consumption, (ii) construction, (iii) machinery & equipment, (iv) housing rental, and (v) government compensation are used for price collection surveys. These product lists provide a ‘structured product description’ for each item which contains price determining characteristics to ensure that the same product specifications are priced by all economies on a ‘like-with-like’ basis. The balance between representativity of the products within the economy and the need for comparability across economies is achieved through consultations with participating economies and with regional and global agencies in preparing and updating the product lists for each cycle. It must also be noted that structured product descriptions are revised from one cycle to another due to changes in market conditions.

For regional comparisons, each region has its own list of items which are used for regional comparisons and estimation of regional PPPs. The region-specific items as mentioned earlier, are expected to be representative of the expenditure patterns of the economies in the region. These regional lists are supplemented with additional items selected from a global core list, which is prepared by the World Bank in consultation with regional

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implementing agencies. The regional PPPs are estimated using the prices of items in the regional lists, while the prices of global core lists are used to derive linking factors to estimate the global PPPs from the regional PPPs. Each economy undertakes price surveys from a nationally representative sample of outlets for a subset of items that are part of the regional product lists to compile annual average prices. The items are representative of the expenditures in the economy and prices are collected on a monthly, quarterly, or six-monthly frequency, or on a once-in-a-year basis depending on the product characteristics and price variability. Table 4.2 summarizes the price surveys and number of items in the product lists used in the 2017 ICP for Asia and the Pacific, which was coordinated by ADB.

The principle of high data quality is integral to ICP implementation and sophisticated statistical tools have been developed to validate data quality and comparability across all participating economies. The price data validation process is carried out in three stages. First, is the national or intra-economy validation stage, where prices for each item compiled by a single economy are validated within the economy to correct for outlier price quotations. The prices are submitted to the regional agencies where inter-economy data validation is performed to identify outliers and inconsistent prices across economies (ADB 2020).

<table>
<thead>
<tr>
<th>Survey</th>
<th>Survey Description</th>
<th>No. of Items in 2017 ICP Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household consumption.</td>
<td>Captures the prices of goods and services typically consumed by the households in an economy. Household item prices are collected on a monthly or quarterly frequency from a representative sample of outlets to provide nationally representative prices.</td>
<td>1,054 items including 879 items for regional comparisons and 468 items for global linking.</td>
</tr>
<tr>
<td>Housing.</td>
<td>Captures annual average rents collected for a representative sample of dwellings. Additionally, indicators on number of dwellings, rooms, floor area, and facilities on access to drinking water, private toilet, and electricity are collected for housing stock in the economy.</td>
<td>20 dwelling types representing apartments and houses of different sizes.</td>
</tr>
<tr>
<td>Government consumption.</td>
<td>Captures annual average compensation paid to government employees engaged in selected occupations in production of health, education, and collective services provided by the government. The data is collected from government administrative records of payments made to the employees.</td>
<td>35 government occupations.</td>
</tr>
<tr>
<td>Gross fixed capital formation in construction.</td>
<td>Captures prices of construction items which include material inputs, rental paid for construction equipment, and labor inputs commonly used in the construction of residential buildings, nonresidential buildings, and civil engineering structures. This is a one-time survey conducted in the reference year from a representative sample of suppliers.</td>
<td>52 construction inputs comprising materials (34), equipment rental (10) and labor (8).</td>
</tr>
<tr>
<td>Gross fixed capital formation in machinery and equipment.</td>
<td>Captures prices for representative items of general and special purpose machinery, electrical and optical instruments, fabricated metal products, transport equipment, and other products that form part of the gross fixed capital formation. This is a one-time survey conducted in the reference year from a representative sample of suppliers</td>
<td>161 items of machinery and equipment.</td>
</tr>
</tbody>
</table>

ICP = International Comparison Program.
Third, is the global or interregional validation stage, where prices are collected and compiled for all economies across all regions and are validated by the ICP global office at the World Bank. Outliers and inconsistencies identified at both regional and global levels are resolved by the participating economies cross-checking, verifying, and correcting data, if needed (ADB 2020, WBG 2020).

**Results of the 2017 ICP provide data on purchasing power parities and real expenditures prior to the COVID-19 pandemic, making them especially useful to track post-pandemic economic recovery.**

During the 2017 ICP, 32 Asia Pacific economies participated, 22 of which were directly coordinated by ADB. These 32 regional economies account for about 56% of the global population. The results show these economies contributed 40% of the world’s GDP using purchasing power parities, higher than the contribution of 34% when measured using market exchange rates.

![Figure 4.5: Contribution to Global GDP, Nominal and Real](https://databank.worldbank.org/source/icp-2017)

BRA = Brazil, GDP = Gross Domestic Product, GER = Germany, IND = India, INO = Indonesia, JPN = Japan, PRC = People’s Republic of China, PPP = purchasing power parity, RUS = Russian Federation, UK = United Kingdom, US = United States, US$ = United States dollar, XR = Exchange Rate.


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6 This section is based on the work of Joshi, Accad, and Song (2021). For additional details on the 2017 ICP Asia Pacific economies that were coordinated by the Asian Development Bank, readers may refer to the 2017 *International Comparison Program for Asia and the Pacific: Purchasing Power Parities and Real Expenditures. (ADB 2020).*
Four of the regional economies are among the top 10 largest economies globally, based on purchasing power parities. The People’s Republic of China ranks first with purchasing power parity-based GDP of $19.6 trillion, slightly above the United States with a GDP of $19.5 trillion. India and Japan rank third and fourth with $8.1 trillion and $5.2 trillion, respectively, while Indonesia is in 10th spot, with $2.9 trillion. The combined share of these four economies was about 30% of global GDP, and 74% of the total GDP of the 32 ADB regional members in purchasing power parity terms.

Similar to the increase in the shares of global consumption observed in the region’s economies for the PPP-based GDP, eliminating differences in the prices also showed increases in the shares of household final consumptions expenditures (measured as actual consumption expenditure by households) and in shares of global investment expenditures (measured as gross fixed capital formation).

The 2017 ICP results also show that five economies—Australia, New Zealand, Japan, the Republic of Korea, and Hong Kong, China—had price levels higher than the world average (=100), while the rest had price levels below the world average of which 14 had price levels half (=50) or below half the world average.

A wide diversity is also seen in the per capita real GDP of the 32 Asia Pacific economies in comparison to the global average. The PPP-based per capita GDP for the 32 regional economies was $11,896 which is 28% lower than the world average of $16,596. Singapore was the third richest economy in the world, with per capita real GDP of $93,981—which was more than five times the global average. On the other side, Nepal had per capita income of only $2,900 which is just 17.5% of the world average. Figure 4.6 plots the Price Level Indices for 32 economies against GDP per capita in PPP terms (in log scale) with the pattern showing an expected upward sloping relationship, indicating that richer economies tend to have higher price levels as well.

**At the subnational level, data on spatial variations of prices of goods and services can be used to examine a geographic area’s competitive advantage and make comparisons about socioeconomic development.**

From a policy perspective, it is important to collect spatially disaggregated price data to understand spatial variations in price levels and competitive advantage of locations. Significant declines or increases in prices of specific goods, commodities, or services in one geographic area relative to others may provide a basis for changes in the flow of trade or capital. At the subnational level, data on spatial price variations may help direct locale-specific policy initiatives. For example, Viet Nam publishes a Spatial Cost of Living Index (SCOLI) at subnational levels that reflects differences in the cost of living across administrative regions which provide insights on how living standards, economic performance, general productivity, and price competitiveness vary across geographic regions (Figure 4.7) (WBG 2021a).
Figure 4.6: Real Gross Domestic Product: Total, Per Capita, and Price Levels, 32 Asia Pacific Economies, 2017

**Figure 4.7: Spatial Cost of Living by Region in Viet Nam, 2018-2022**

SCOLI = Spatial Cost of Living Index.

Importance of PPPs

From a statistical point of view, there is a need to control the differences in price levels between economies to facilitate cross-economy comparisons that reflect only variations in the volume of economic outputs as purchasing power of different currencies are equalized. This serves as the rationale behind the ICP's compilation of purchasing power parity (PPP). The PPP measures the amount of national currency units required to purchase a basket of goods and services in an economy that can be purchased with one unit of reference currency in the reference economy (ADB 2020). By expressing this measure in a common currency, PPP-based comparisons differ from comparisons based on market exchange rates in that they distinguish between the relative price levels of different items in economies. In addition, PPP-based comparisons are also less sensitive to volatility of market exchange rates (ADB 2020; WBG n.d.). Data on PPPs can also help policymakers understand how socioeconomic development evolves over time. Along with enabling inter-economy comparisons of real GDP and its components, PPPs are used in monitoring the SDG poverty reduction target against international poverty lines expressed in PPP terms (WBG 2021a). Other PPP-based indicators in the SDG framework help monitor the human development index, income inequality, education, energy intensity, health expenditure, labor productivity, carbon dioxide emissions per unit of GDP, and they are also used in the World Economic Forum's Global Competitiveness Index (ADB 2020; WBG n.d.).

The major recommended uses of PPPs include spatial comparisons of real GDP to measure relative sizes of economies, labor productivity, income per capita, and actual individual consumption (AIC) per capita. They also enable spatial comparisons of price levels and can be used to group economies by volume index of GDP, AIC per capita, and by price levels of GDP or AIC. Other uses include analysis of temporal changes in relative GDP per capita and relative prices, to examine price convergence, and to make spatial comparison of the cost of living. (WBG 2020).

Since 1990, PPPs from the ICP have become an important tool for estimating the incidence of absolute poverty at the regional and global level, with PPP data used to establish international poverty lines and to calculate the number of people living below them in each economy. Additionally, PPPs are used by many international organizations such as the IMF, which uses PPP-converted real GDP in its current quota formula to determine subscriptions from member economies, financial assistance to members, and the share in general allocation of Special Drawing Rights. ADB's Corporate Results Framework 2019-2024, meanwhile, includes SDG indicators whose measurement depends on PPPs to track development progress in Asia and the Pacific. (ADB 2020; WBG2020).

Caveats on Use of PPPs

Amidst the diversity of potential policy uses for PPP data, there are caveats worth noting. For instance, (i) PPPs are not a precise metric to establish the strict ranking of economies; (ii) PPPs over two periods are not directly comparable and should not be used
to comment on domestic inflation; (iii) PPPs are not used for temporal comparisons such as per capita real income over two benchmark years and should not be used to directly measure growth rates; (iv) PPPs are not a yardstick for comparing economic output and productivity by economic sector, and (v) PPPs should not be used as a basis for assessing whether a specific currency is undervalued or overvalued, or as equilibrium exchange rates (WBG 2021b).

Additionally, there are technical nuances worth noting. For instance, while PPPs are calculated for various expenditure components of the entire economy, the data do not necessarily correspond to expenditure patterns of a specific sociodemographic or income group. Instead, price and expenditure data used to calculate PPPs is representative of various components of an economy's GDP-related expenditure namely, final consumption expenditure by households, non-profit institutions, and government; investment expenditure in the economy, and net exports.

While using PPP data, the user must select the appropriate PPP relevant to the given problem because each PPP is representative of a specific basket of goods and services. Furthermore, while there have been attempts to compile PPPs for people living below the poverty line by collecting prices of goods and services paid by the poor in markets and outlets they frequently patronize, the results of this collection have shown that some PPPs are not significantly different from PPPs calculated for the entire population. There are also cases that show that price data collected from poverty specific surveys can affect the numerical values of the PPPs (ADB 2008).

ICP Implementation Experiences and Best Practices from the 2017 ICP in Asia and the Pacific

This section presents a summary of implementation experiences in the 2017 ICP cycle of the 22 economies participating in comparisons for Asia and the Pacific regional grouping, coordinated by ADB. While ADB leads in coordinating technical operations, organizing training workshops, validating data, and computing regional PPPs, the implementing agencies of the participating economies play the most important role of conducting primary price surveys and collecting data. These survey and data collection processes follow uniform concepts and standard survey protocols. Each implementing agency conducts price surveys and provides annual average prices for a representative set of consumption and investment items from the regional product lists and detailed

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7 Implementation experiences are referenced from Chapter 7 of the Asian Development Bank’s 2017 International Comparison Program for Asia and the Pacific: Purchasing Power Parities and Real Expenditures. https://www.adb.org/sites/default/files/publication/639696/icp-2017-results-methodology.pdf and information received from participating economies in ICP.
GDP expenditures which serve as basic inputs for the calculation of regional PPPs and real expenditures. ADB’s partnership with regional economies is based on basic principles of transparency, cooperation, ownership, and commitment to collect high data quality that results in reliable PPPs for the region.

Successful strategies used by economies to implement program activities can serve as best practices for future ICP surveys.

The experiences of agencies implementing the ICP cover a wide range of activities involved in large-scale statistical surveys. The agencies participating in Asia and the Pacific have very diverse statistical capacities and statistical practices. An assessment of their experiences shows both commonalities, as well as diversities, along with the challenges they face in carrying out this complex process.

There are two main data requirements for the ICP. The first is GDP expenditures for 155 basic headings following a standard ICP classification, and secondly the national average prices of a basket of representative and comparable goods and services underlying different basic headings in each economy. As the price surveys cover items of household consumption, government consumption, and gross capital formation, price collection operations and validation procedures have been devised for each of these surveys.

Table 4.2 presented earlier shows the list of surveys and number of items in the product lists for the 2017 ICP cycle for Asia and the Pacific. Among them, the household price survey with a list of more than a thousand items is the biggest and most resource intensive and comprises more than 80% of the price collection work undertaken by the implementing agencies. The household price survey is to be conducted in all four quarters of the year, with prices collected monthly or quarterly for most of the products in the urban and rural markets to account for seasonal variations, giving a national annual average price for each product. The surveys of gross fixed capital formation are specialized surveys of items of construction and machinery and equipment and are conducted only once, preferably during the middle of the year to collect prices of representative products for the benchmark year.

Synergies and harmonization in the ICP price collection and regular national price surveys for consumer price index compilation is advocated as a good practice.

All ICP price surveys are equally important but with more than a thousand items in the regional household consumption basket, and with data collected nationally and throughout the year, household price surveys are the most resource intensive. The 22 participating economies collected prices for more than 4 million quotations for the household survey in 2017 ICP, reflecting the large size of survey operations. If adequate human and financial resources are not provided, the coverage and quality of price data will be consequently affected.
While recommending that the ICP benchmark cycle be implemented every three years, the UNSC also appealed to participating economies to integrate and harmonize ICP activities with their own statistical programs, especially collection of CPI data. Integrating ICP and CPI price surveys is therefore advocated as a best practice. At the same time, implementing agencies should ensure that the basic objectives of CPI as a representative and reliable indicator of tracking temporal price movements in the economy are not compromised by this harmonization process.

Integrating the ICP and CPI processes involves optimizing resources within national statistics agencies for data collection, field supervision, data entry, and data validation. This integration process can strengthen the capacity of statistical agencies to address weaknesses in CPI operations to improve the overall quality of CPI data collection. One of the biggest advantages in integrating the ICP framework at the national level is that it allows for comparisons of price levels across regions within an economy, thus facilitating subnational PPPs for which there is growing demand.

The rest of this section looks at examples of integration of the ICP and national CPI processes amongst the 22 economies coordinated by ADB in the 2017 ICP. These include practices from administrative setup, use of existing infrastructure to collect data, survey coverage and frameworks, challenges in implementation, lessons learned and future directions for use of the ICP. The same processes are being adopted in the 2021 ICP cycle.

**Implementing agencies have established ICP teams comprising statistical experts with responsibilities assigned for implementation of survey activities and coordination with ADB.**

One best practice that has been observed in Asia and the Pacific has been the establishment of ICP teams by implementing agencies for the express purpose of carrying out ICP surveys and data processing. These teams are led by a National Coordinator, who is a senior level statistician, along with a Deputy National Coordinator. Each team is made up of experts with clear assigned responsibilities for specific ICP survey operations, including data collection, data validation, data submission, and coordination with ADB, under the overall leadership of the National Coordinator. Participants nominated for periodic training sessions with ADB are selected from the relevant ICP team. This approach helps provide continuity to the ICP process, supports capacity building, and builds up team ownership of the program.

**Conducting ICP price surveys nationally is a best practice followed by most economies in Asia and the Pacific.**

Ideally, price surveys for both the CPI and ICP should be national or economy-wide (covering both rural and urban areas) for the prices to be representative of market transactions across the economy. However, in some economies, only urban locations
are covered in the CPI. One reason is that urban centers reflect the bulk of household expenditures and for most nonfood items (such as clothing, footwear, electronics, durables), rural households often purchase them in urban areas.

While the CPIs are usually designed to provide reliable measures of price changes at the national and sub-national levels, the ICP is intended to capture the national average of prices, including both rural and urban locations. Typically, a subset of the entire set of CPI markets is expected to provide adequate representation for estimating national average prices.

For example, in India, while CPI coverage is from 1,181 rural markets covering almost all districts and 1,114 urban markets of 310 towns of the economy, only a subset of 320 rural and 577 urban markets representing all regions of India were selected to provide reliable estimates of national average prices for the ICP (ADB 2020). In Asia and the Pacific, all economies (except three) have economically significant rural markets and cover both rural and urban prices in their surveys, reflecting the best practice of collecting representative national annual average prices.

A number of other best practices followed in the region, which are specific to the ICP household price surveys, are summarized in Table 4.3. They aim to provide an understanding of the levels of integration of CPI and ICP activities. The summary is based on information submitted by implementing agencies in the 22 economies to ADB in response to a World Bank questionnaire on CPI-ICP integration and updated with the information submitted to ADB on the 2017 ICP household survey frameworks. It aims to provide insights into the practices followed and levels of integration of CPI and ICP activities.

**CPI and ICP are implemented by the same organization.**

In the 2017 ICP cycle, national statistical offices served as ICP implementing agencies in 21 of 22 participating economies. The only exception was Thailand where the ICP was the responsibility of the Trade Policy and Strategy Office in the Ministry of Commerce, which is the official agency tasked with producing the CPI in Thailand. Further, in 21 economies, price collection operations for the ICP were assigned to the units or divisions responsible for the CPI. The only exception was Nepal, where the National Statistics Office was the implementing agency for the ICP, with the Nepal Rashtra Bank responsible for CPI, highlighting slower progression in harmonization.

Nonetheless, in all 22 economies, national statistical agencies as the implementing agencies for ICP price surveys, ensured that they were managed by staff experienced in data collection, supervision, and data validation. These agencies are also best placed to identify appropriate subsets of items from the ICP regional item basket so that the items priced for ICP surveys are also representative of the household consumption expenditure of the economy.
Staff engaged in CPI price collection are commonly utilized for ICP in most economies.

Having skilled workers carry out data collection and data processing is an important element of the survey process. Of the 22 economies coordinated by ADB in the 2017 ICP, price collection was carried out by a subset of CPI price collectors in 11 economies and was partly undertaken by CPI staff in nine economies. The ICP uses detailed Structured Product Specifications (SPDs), while the CPI items list does not usually include such detailed product characteristics. Experienced CPI staff are familiar with the nuances of price collection and can be easily trained for ICP price surveys to ensure they can correctly identify ICP items using prescribed SPDs for ‘like-with-like’ comparisons.

Price outlets used in the CPI survey design are commonly used for ICP when possible.

Whenever possible, selecting CPI markets and outlets for ICP price collection helps in capturing prices for both surveys in the same visit. These selected outlets are considered representative or popular for pricing specific items. Eighteen economies reported using CPI price outlets also as the source for ICP item prices. However, it may be noted that ICP prices are also collected from non-CPI outlets, when the CPI outlet is not a representative outlet for the specific products.
Using prices of CPI items for ICP items with common characteristics is practiced in many economies.

Another key aspect of CPI-ICP integration is making use of prices of overlapping items between the CPI and ICP. As the prices for CPI items are already collected for CPI compilation, their use for ICP helps reduce the burden of data collection. However, it is essential that the CPI items meet item specifications prescribed for ICP to ensure comparability.

Reflecting the need to maintain comparability of ICP prices across economies, significant efforts have been made by implementing agencies to compare CPI specifications with the ICP SPDs.

Mapping CPI items at the national level with ICP items is challenging because often the CPI items do not have the same level of details as SPDs, such as brand type, weight/size/quantity, packaging, standard unit of measurement, and other information. In some economies with diverse CPI item baskets across several regions, identifying nationally representative CPI items with the same specifications as ICP items is not really feasible.

From the 22 economies coordinated by ADB in the 2017 ICP, (Figure 4.8) 16 made use of prices from CPI items mapped with ICP items. Of those that used CPI prices in their ICP survey, below 20% of ICP item prices were sourced from the CPI in three of the economies, around 20%-30% were sourced from five economies and between 30%-40% were sourced in four economies. Another four economies were able to make use of CPI prices for more than 40% of the ICP items priced.

Source: Responses from economies to ADB’s 2017 ICP Household Survey Framework Questionnaire.
Of the six economies that reported not having used CPI prices for their ICP survey, one did not have access to CPI prices, while the others possibly could either not gather mapping information due to the wide diversity of CPI items baskets, or because of inadequate information about product characteristics in the CPI items basket, making it difficult to map CPI items with ICP product specifications.

Food items in the CPI are more comparable with the ICP item list than other categories, although great care is needed to convert the prices to the same units of measurement as those in the ICP to ensure comparability. A large percentage of items for the ICP household survey were collected through a separate ICP survey of nonoverlapping ICP items. The larger the overlap between CPI and ICP items, the less the need for additional resources for ICP surveys.

Additionally, all 22 economies provided product catalogues prepared by ADB with item SPDs and a reference image, while some economies translated the ICP product list from English into the nationally spoken language to benefit price collectors. These practices helped underpin the quality of the surveys process, while balancing the requirements of representation and comparability.

Some economies are continuing steps to enhance product descriptions in their CPI product lists to better match them with ICP products. They are also replacing some existing CPI items with suitably representative ICP items in their CPI basket when feasible. Several economies have indicated they have future plans to enhance integration of CPI and ICP at the time of the next base-year revision.

**The price collection schedule for CPI and ICP items is synchronized where feasible.**

An additional feature of integrating the CPI-ICP processes is scheduling the price collection operations at the same time. In nine economies, the ICP survey was carried out at the same time as the CPI survey, while in another seven, simultaneous price collection was possible only for overlapping items. The remaining six economies chose to have largely independent price collection for ICP. The choice of timings of the two surveys depends upon available staffing, frequency of price collection for CPI items against ICP items, and internal priorities, with the timely release of monthly CPI viewed as a key macroeconomic indicator.

**Use of the same data processing systems and editing protocols for CPI and ICP prices is less prevalent.**

Just eight of the 22 economies coordinated by ADB in the 2017 ICP captured CPI and ICP price data using the same computer data processing system, while two reported using the same system only for overlapping products. The remaining economies have independent data processing systems for CPI and ICP. However, 12 of the 22 economies said they used the same data editing and quality control procedures for the two surveys.
In addition, all economies, except one, reported that ICP data validation procedures have helped improve their own CPI data validation processes.

The frequency of data collection is another important dimension to consider in the estimation of national annual average prices of ICP items that represent prices underpinning corresponding annual GDP expenditures. Data collection frequencies for household items can vary depending on the type of products and the specific economy. Some of the 22 economies in the 2017 ICP, collected prices of perishable food items on a weekly basis, while other food items were collected monthly. Prices for nonfood items were usually collected on a quarterly basis, and some items like durable goods, healthcare, education, package holidays, accommodation services, and others, were collected semiannually.

The experiences of the 22 economies in the 2017 ICP, show an encouraging shift to increased integration of CPI-ICP activities, as well as commitments to further synergies in future. It also reflects efforts by the participating economies to strike a balance between the need for nationally representative annual average prices for ICP, and the resources required to collect such information.

**Use of Nontraditional Data in Price Collection**

There are two approaches that can be taken to collect price data. The traditional approach involves choosing representative products to be surveyed, considering their specifications and data availability, selecting sampled outlets for price collection, visiting the outlets physically to collect prices on specific days of the week, month, or quarter, and using quality adjustment methods to remove the element of price change stemming from changes in quality. The nontraditional approach uses data available from big data sources, such as transaction or scanner data, or online data web scraped from the internet.

In compiling the CPI, the use of nontraditional data sources is currently being studied, and methods and challenges in their use are being tested in advanced statistical systems. These nontraditional sources and approaches are expected to improve the accuracy and frequency of index creation, while reducing the burden on price statisticians and reporting firms. However, there are several practical challenges, and their use so far has been generally limited in CPI compilation (IMF et al. 2020).

The use of nontraditional data sources for the ICP is also developing. In the current 2021 ICP cycle, pandemic constraints affected the physical collection of prices, with many economies resorting to online collection and web scraping. While the use of nontraditional methods for collecting price data for the ICP is still in its infancy, it nevertheless has the potential to improve the accuracy and frequency of the data, while reducing the burden on price statisticians and reporting outlets.
Challenges and Lessons Learned for Future ICP Implementation

The most significant challenge in the household consumption price surveys is correctly identifying products following the prescribed ICP SPDs, including the unit of measure, brands, and size measures across different regions, and within and across economies. Incorrect identification of product characteristics has contributed to high variations in national average prices and outlier prices. To resolve this concern, coordinators in national implementing agencies, along with regional coordinators, used standardized statistical tools for data validation and to identify outlier quotations and prices in the 2017 ICP. National coordinators followed up with the price collectors to clarify and correct the prices.

Similar challenges were faced in the case of items in the construction, and machinery and equipment surveys. Unlike CPI price collection, these two specialized surveys are not regularly undertaken by many national statistics agencies and are therefore only carried out for ICP purposes. The lessons from these surveys are that there is a need for more detailed product descriptions and explanatory notes along with rigorous training of price collectors ahead of the start of each survey to prevent or reduce errors at the collection stage. Taking these steps will save time at the data validation stage and improve the quality and comparability of price data.

ICP Data Governance and Privacy

Information on prices of items included in the ICP can be a valuable tool for research and under the program’s data policy, researchers can access national annual average prices of ICP items. This can be done by applying for information from a regional implementing agency, and/or the World Bank. However, it should be noted that this data cannot be publicly disclosed and can only be used for the research purpose stated in the application. Confidentiality of price data is one of the principles followed by the ICP.

Additionally, requests for subnational price data for research purposes can only be made directly to a national implementing agency. It should be noted, however, that since the ICP is designed to capture ‘nationally representative annual average prices’ for cross-economy comparisons, it is not a suitable tool for making reliable subnational price comparisons and therefore users need to be cautious about the limitations and representativity of the data for any sub-national analysis.
References


