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In Praise of PPP Comparisons

Paul Samuelson, *Nobel Laureate, Massachusetts Institute of Technology*



Thomas Kuhn's magisterial 1962 *Structure of Scientific Revolutions* justly described how great new revolutionary paradigms can arise to explain previously inexplicable empirical phenomena. Einstein's 1905 theory of special relativity is a good example. Still another is Charles Darwin's theory of evolution by natural selection.

As astute physicist Freeman Dyson has pointed out, often a different source of scientific resolution can come from discovery of new measuring devices. Copernicus and Kepler could go so far. But after the telescope was perfected, Galileo and Newton could go much farther. Similarly, modern biology and medical practice would not have been possible without the discovery of the microscope, x-rays and numerous other scans.

Although political economy lacks the precision of some of the hard sciences, we economists can similarly recognize the pivotal role of new computer hardware and software. As the International Comparison Program (ICP) celebrates its fortieth anniversary, I write to praise its pioneers led by the late Irving Kravis of the University of Pennsylvania who persisted over many years in estimating purchasing power parity (PPP)-- the corrected measure of real incomes for societies at varied stages of affluence.

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Remarks on ICP Anniversary

Robert E. Lucas Jr., *Nobel Laureate, University of Chicago*



Many years ago, not long after Milton Friedman and Edmund Phelps argued theoretically that long run Phillips curves should be vertical, Leonard Rapping and I got the idea of using cross-country comparisons to test this natural rate hypothesis: Was it true that inflationary economies did not have lower average unemployment rates than low inflation economies?

But as we began to put together a data set suited to this project, we ran up against the fact that there was no internationally agreed on definition of unemployment or on a procedure for measuring it.

Cross-country unemployment rate differences could mean almost anything, and nothing short of detailed country-by-country studies, based on uniform principles, could give us the data we needed. This was not a job for two ambitious assistant professors and so we moved on.

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Dear Readers,

This commemorative issue marks the celebration of two important milestones - the 40th anniversary of the ICP and the publication of the final results for the 2005 round. It carries articles by distinguished scholars and experts that reflect on the past four decades, and look ahead to identify key opportunities and challenges.

In a succinct article, Paul Samuelson pays homage to Irving Kravis, Alan Heston and Robert Summers for their pioneering role in providing intellectual leadership and lifelong dedication toward building a global public good of great importance. Robert Lucas shares his personal reflection on the role the ICP played in enriching our understanding of production and living standards by making theories and stylized facts amenable to empirical scrutiny and analysis.

Another highlight of this issue is an interview with Alan Heston and Robert Summers. Alan and Bob share their thoughts on many topics ranging from priority research areas to data access policy. Dennis Trewin's and Fred Vogel's articles present the long strides the ICP has taken during the 2005 round. Enrico Giovannini provides a perspective of the OECD experience over the last 25 years.

The methodology section contains three articles. Bart van Ark, Angus Madison and Marcel P. Timmer discuss the history and transformation of the International Comparison of Output and Productivity (ICOP) and provide some thoughts on how a synergy between ICOP and ICP can be developed, strengthened and sustained. In a thought-provoking piece, Michael Ward discusses how long-term economic concerns like global inflation can be measured. Christopher Murray and Ajay Tandon focus on the issue of PPP comparison in health highlighting both the benefits and limitations of the data in current circulation.

This issue also contains important articles on organizational and operational aspects of the program from regional and national perspectives. Carmelita Erieta writes on capacity-building, focusing on the

Philippines experience. Abdullateef Bello's piece presents a comprehensive statistical capacity-building enterprise initiated and funded by the Islamic Development Bank and discusses how it benefits from and contributes to the ICP.

Ben Whitestone and David Fenwick present a successful partnership between the African Development Bank and the UK Office of National Statistics in the technical implementation of ICP in Africa. Four national experts from South America -- Graciela Bevacqua (Argentina), Marina Fantin (Uruguay), Marcia Maria Melo Quintslr (Brazil), and Francisco Ruiz (Chile)-- have teamed up to share their perspectives.

In this issue, we've also included a summary table, containing final results of the 2005 round.

Noteworthy

IMF Board of Directors backs a resolution to reform member countries' quota and voting share allocations. The new quota allocation formula contains four variables including PPP-adjusted GDP. The resolution, which must be approved by the IMF Board, brings IMF's quota allocation and voting shares in line with member countries' relative weight and role in global economy. In the process, it enhances the participation and voice of emerging and developing countries. It also marks a significant milestone for ICP, as it represents a first and critical step toward using PPP data for operational policy decision-making. The IMF report can be accessed at: (<http://www.imf.org/external/np/pp/eng/2008/032108.pdf>)

Yonas Biru



Alan Heston
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Robert Summers
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Interview with Alan Heston and Robert Summers

Reflecting on the history and transformation of ICP over the last four decades, what have been the primary challenges and the key milestones, particularly in respect of methodological and operational developments?

The first priority had been to establish a framework within the national accounts that would permit price comparisons. While the production-side Purchasing Power Parity (PPP) comparisons would have been desirable because they permit productivity studies, the choice was made to work with the expenditure side because it only entailed comparisons of the final products, and not the intermediate products. A second priority was to move away from binary comparisons to a multilateral framework. At the basic heading level, this meant dealing with incomplete matrices of prices, which led to the development of Summers' Country-Product-Dummy (CPD) method. This simple hedonic model in a weighted or unweighted form has since been extended to take account of the characteristics of outlet and product in addition to location.

At the aggregate level, it was decided to opt for a multilateral method that was additive across countries and over products. The preferred method for this was the one developed by R.C. Geary for the Food and Agricultural Organization (FAO), which was later modified by Salem Khamis. In addition, the first phase of the ICP reported the results of EKS, Van Yzeren, Walsh, as well as binary results. In addition, error bands were investigated for the estimates, a prelude to the grades we were to apply to the bench-

mark extensions in our extrapolation work.

The major milestone for the ICP has been the acceptance of PPP-based conversions either in the benchmark comparisons or as used in the World Bank's World Development Indicators, by IMF's World Economic Outlook, or by researchers who use the Penn World Tables (PWT). By late 1970s and early 1980s, economics textbooks and some of the media were using PPPs in their publications. For measuring volumes, PPP-based conversions of GDP and related aggregates performed better in social science models as an explanatory variable in a variety of applications (e.g., convergence models).

What distinguishes the 2005 round from previous ones?

During the early ICP rounds through 1975, all prices were handled centrally, so the issue of regional linking did not occur. In 1980 and subsequent comparisons until 2005, the resources put into linking individual items and headings across countries were inadequate. So one qualitatively important change had been a quantum improvement in the way regional comparisons were linked together from the standpoint of reviewing price collection. A second improvement was the methodology of linking at the basic heading level in a way that was not dependent on the particular link or ring countries from each region.

In the early rounds, an expenditure classification system was developed that has remained the framework for comparison through 2005. However, a major change in

... speaking of important changes in the 2005 round ...

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2005 was to develop in this framework a coding system based on the classification of individual consumption by purpose (COICOP) that is scheduled to be the international standard for all countries including in their national work (e.g., CPIs). So this major overhead cost born in 2005 has the potential to greatly reduce the national resources required of participating countries in future rounds. This, in turn, would make them difficult to translate their own coding into the ICP.

During the 2005 round, the Technical Advisory Group, in cooperation with consultants and the Global Office staff, developed a handbook. This is continually updated on the Bank ICP site to make it easier for participating countries or other interested persons to be at the cutting edge of thinking on various ICP problems and methodological issues.

Further, the TAG was able to advance the state of knowledge in two additional areas. Modified methods for comparing construction and producers' durables were tried in the 2005 round. The contributions to the 2005 comparison of these methods are still being evaluated and the benefits of this work are again likely to be only fully realized in future ICP rounds.

A strong consensus has emerged on the need to build on the current momentum. Where do you think the future challenges and opportunities lie?

A continuing challenge for the ICP is the need to gain the cooperation of national statistical offices in the provision of data that are not a standard part of their collection. Once the statisticians become involved in the ICP, they often see the advantage of the ICP product and service descriptions, data handling methods, and other procedures that can aid in their national work. However, for most countries, the priority will always be their national statistics, so it is clearly appropri-

ate for the ICP to integrate their data requests as closely as possible with country practices.

For the national accounts, this would appear much easier than for prices since there are agreed standards in the System of National Accounts (SNA). However, countries have learned that country practices are anything but standard in respect of the services of owner-occupied housing, the inclusion of developers' margins in construction, and the like. As a consequence, the ICP faces a major challenge in convincing countries that it is important that they not only price items that are comparable but their national accounts be based upon recent surveys with as many cross-checks as possible. Otherwise the volume comparisons derived from good price comparisons will be misleading.

For price comparisons, a major challenge is the fact that the framework for CPI price collection in countries may not be appropriate for place-to-place comparisons. Because prices tend to change over time within a country in the same direction, one may get a good reading on temporal price movements in an entire province by sampling prices in one urban center or an adjacent province. However, this framework of price collection is not much of a guide for spatial price differences, except in small countries like Singapore. For large countries like China or Brazil, collection of prices in major urban centers may be adequate for a large variety of commodities but of limited use for price comparison of services including housing. This remains a major challenge of the ICP in obtaining national average prices for comparison. And while a number of proposals are out there for dealing with this issue, a consensus on a feasible method has yet to be reached.

One important challenge and possible opportunity for the ICP lies in handling the foreign sector. The 146 countries in

the 2005 round present a very complex mix of countries of which a surprising number have exports and imports in excess of their domestic production. As in the past, the 2005 round only converted the net foreign balance at exchange rates and did not take into account that the PPP for exports may be quite different from the PPP for imports or the exchange rate. It is clear that there is a large margin of error for small countries like Hong Kong, Luxembourg, and Bahrain, because they have large trade balances, and/or are offshore financial centers. In our increasingly interdependent world economy, both real and financial, there are some methodological issues that the ICP clearly needs to face in the future in the treatment of the foreign balance.

Much of the interest in the ICP focuses on individual country comparisons of real output per person and the degree to which a country may be considered cheap or dear-- that is its price level, PPP/Exchange rate. However, regions are also interested in their importance in the world (e.g., what is the relative economic size of the OECD and Asia?). To answer this question, one can total up the per capita GDPs of countries times their populations to attain a regional GDP. However, in some ways aggregation of EKS GDPs may not be the appropriate way to attain such an aggregate because it weights countries equally. Using the G-K method, countries can be weighted by size but it has a potential downside because it assumes the quantities consumed in countries are what they would be if they faced the international prices used to value their output-- an assumption certainly not appropriate for large parts of consumer expenditures. This has always been our practice to present the results of several methods while devoting our analysis to our preferred set of results. Certainly, if only one set of results is to

be presented, then there is more work on the ICP plate to gain consensus on a preferred method.

Given the rapid integration of world markets, can and should the ICP attempt to measure and monitor how a country's price relatives are changing over time with respect to global inflation?

There is certainly a way to measure global inflation, namely weighting national measures of inflation, like the GDP deflator, by the size of the total GDP of economy converted at PPPs. However, the contribution of the ICP to this process is only to provide the weights. There is nothing inherent in successive ICP benchmarks that provide a measure of world inflation that does not involve some weighted average of country inflation rates.

And unfortunately, the same is true for relative prices. In any benchmark, we can measure relative prices of, say, haircuts to the price of a specified TV set. But it is not possible to say anything about the changes in the relative prices of haircuts and TV sets between two benchmarks without recourse to national measures of temporal change in haircut and TV prices. We do know that deflators or services have risen faster than commodities in most countries over the past 35 years of ICP benchmarks. But the ICP can only call attention to the dramatic differences in relative prices of commodities and services across countries at a point in time, not to what happens between benchmarks.

There seems to be a lack of consensus on providing access to micro data such as product level national average prices. Tension remains between confidentiality concerns and data accessibility. Disagreement also persists over whether basic heading level data should be made widely available. Should we err on the side of caution and restrict access or promote an open access policy?

Can you share your views on this issue?

When we were processing benchmark information at the University of Pennsylvania, we were never free to provide item price information to interested users without permission from the participating countries. In the early years, the European Union (EU) published the national prices that they used, which is the only instance that we can recall of prices being made available. And of course, that is a far cry from present practice in the EU or OECD or any other region. Of far more interest than national average prices would be CPD equations at the basic heading level based on price collection for items within countries that had characteristics coded with the price like outlet type, location within the country, product and item features (e.g., packaging, size and brand as some of the price determining characteristics). This has been done for the United States (Aten, 2006) with promising results. It allows countries to provide prices to compare with other countries that hold the most important price-determining characteristics constant.

Our approach to providing the roughly 150 basic heading parities was to explicitly recognize that these data were not of the quality of the more aggregated data, where measurement errors tend to offset each other. We made the basic heading data available in an appendix and used our more aggregative measures, usually 35 independent aggregates in a total of 48 summary headings for the main text and analysis. When we were involved with publishing benchmarks, it was of course, hard copy times. In the world of the 2005 benchmark, providing the basic heading information upon request to researchers and other users, with restrictions, perhaps, on reproduction would seem a parallel approach.

How would you assess the 2005 benchmark results?

The new results provide a different world economic snapshot compared to those currently informing our perceptions. Measures of poverty, the total size of economies and the gap to close between rich and poor implicit in the 2005 round are all likely to be altered. Since most people resist changing their mindset, it will take some time for the new metric of the world economy provided by the 2005 benchmark to be fully accepted and absorbed. Some will still like the older image, but the 2005 Global comparisons is a better snapshot of the world economy than what existed before. The 2005 picture is still fuzzy in some areas and in need of improvement, but this round has helped set up a framework for still better comparisons in the future.

Can you explain the impact of new methodologies employed in the current round on the comparability of the recently released global data with previous benchmark results?

Two major issues arose in 2005 round of the comparisons. The EU-OECD-CIS (46 of the 146 countries), were already committed at the outset to a methodology for their regional comparison. Asia found it difficult to carry out comparisons for rental and owner-occupied housing using rental surveys or direct comparison of quality-adjusted quantities. These are the methods recommended in the ICP manual, and used by EU-OECD-CIS, where most of the comparisons in the EU are based on rental surveys, and quantity comparisons are carried out in the CIS and linked through a group of EU countries that do both. Asia took the per capita volume of consumption, excluding rents, as an approximation of the

continued

volume of housing services per capita. The other regions either used rental surveys or quantity comparisons or a combination of the both to compare rental services. So one problem arose: how to link housing? The method adopted was to use quality-adjusted quantities across the region. This is a somewhat different method than used in earlier benchmarks that will hopefully be improved in the future; there appears no obvious error this would introduce into the global comparison. However, it does mean that users need to understand this lack of comparability for rental services when comparing countries in Asia with countries in other regions.

6 The second issue relates to comparison of services of civil servants, health and education workers across countries. Because these outputs are not typically priced, volumes were obtained by dividing compensation by a PPP derived from a detailed comparison of salaries for specific occupations. It had been recognized that this procedure assumed equal productivity across countries in a given occupation, which was unlikely given very different amounts of capital per worker. Further, very low-wage economies have little inducement to organize work to improve productivity of their employees, including in administrative, health and education services. In the 2005 benchmark, the range of countries was much greater than in previous rounds, and some consequences of the equal-productivity assumption loomed much larger. In Asia, for example, salaries for the same occupation differ by a factor of 100 between Vietnam and Hong Kong. Similar differences exist between Yemen and Kuwait in the Western Asia comparison. Without some adjustment to productivity, the resulting per capita volumes in Yemen or Vietnam would greatly exceed those of its richer neighbors.

Asia, West Asia and Africa have carried out such adjustments based on estimates of capital per worker in the whole economy of each country. This poses a problem of comparability across regions in 2005 because EU-OECD-CIS and South America have not made such adjustments. A linking procedure employing regional productivity adjustments was used to increase the comparability for these expenditure headings

Of more importance, however, is what this means for comparing the 2005 results for previous benchmarks. In previous benchmarks, the volume of administrative, health and education services for very low-wage countries in Africa, Asia, and West Asia would have been substantially lower if the 2005 procedure had been adopted in these benchmarks. Everything else in the same methods adopted for these sectors has the effect of producing a smaller spread in real GDP per capita between rich and poor in 2005 than in previous benchmarks.

Anything you wish to add?

In working with the benchmark ICP data and the derivative PWT database, we have sought to bring out aspects of the results that go beyond the standard national accounts aggregates. For example, because users equated per capita GDP with productivity in a number of applications we supplied an admittedly weak, but still better alternative, namely per worker output. Other aggregations of detailed headings were also developed such as services and commodities and tradables and non-tradables. We have also used the ICP data to look at the world income distribution, to estimate capital stocks using the perpetual inventory method and to develop similarity measures of prices between pairs of countries. Many of these efforts have been taken up and extended or improved

upon by others, all of which, to say there is a wealth of information in the ICP that goes much beyond the basic national accounts aggregates. ■

Aten, Bettina (2006), Interarea price levels: an experimental methodology, Monthly Labor Review of BLS, September 2006, Vol. 129, No. 9



Dennis Trewin
ICP Executive
Board

What have we learnt from the 2005 ICP Round?

Now that the preliminary results of the International Comparison Program have been published, it is time to reflect on how this round of the ICP has fared. No doubt there are still many areas that need to be improved, but overall it should be considered a success. It is clearly superior to previous rounds in part because of the involvement of many more countries including China and India for the first time in twenty years. At the same time, regional statistical organizations have been much more active this time. Furthermore, the data collection from countries has been more accurate due to a number of initiatives explained below.

Final estimates of the current ICP was published in February, which included more detailed estimates as well as revisions to the preliminary ones.

The main purpose of this article is to reflect on this round, particularly the changes that have been made to make this a greater success than previous rounds of the ICP.

UNSC deliberations

The organization of this round was based on a concerted effort by international and national statistical agencies aimed at doing a better job than in previous rounds. A review of earlier rounds by Jacob Ryten played a major role in this regard. Significant discussions about the ICP's organization were held at the United Nations Statistical Commission (UNSC) in the late 1990s and early 2000s. A small group, led by Jacob Ryten and Rob Edwards, was set up to outline the precise governance and other arrangements that should apply to this round. These were agreed to in 2002. As a consequence, this round of the ICP has been better planned, better managed, and better resourced with much higher country participation.

Annual reports on progress have been provided to the UNSC. These reports also identified issues,

which it might want to discuss.

The UNSC continues to take an active interest in the ICP. It has established a 'Friends of the Chair' group to review the arrangements for this round and make recommendations for future rounds. Their report was considered at the UNSC meeting in late February 2008.

The revised governance structure

The ICP is one of the most difficult global statistical activities to manage and one of the most complex to implement. It involves collecting very detailed comparable price and expenditure data, according to agreed standards, on a coordinated basis in nearly 150 countries over a short period of time. In spite of this complexity, in the past the ICP has not benefited from a governance structure designed to meet its needs. As a consequence, considerable efforts were put into the exercise this time, ensuring that the governance arrangements for this round were in accordance with best international practice. The following paragraphs, extracted from the agreed statement on the ICP governance arrangements, highlight the point.

In particular, the statement recognized that if the program were to be successful, coordinated efforts and effective management were required at the global level, within regions and in participating countries. Users will place their trust in data quality if they can be convinced that a strong management team was in place.

Governance at the regional level required the regional agencies to display a much keener and intimate involvement with national efforts than in the past, an involvement comparable to what is already in place in Eurostat and at the OECD for their price comparison programs.

Ownership of the project at national level could

One aspect of ICP that needs to be examined in the future is how the ICP might be improved to provide better data for poverty analysis.

One of the main applications of PPPs is to improve the accuracy of poverty analysis.

Having accurate national PPPs is a major step forward.

continued

only be secured if substantial responsibilities are handed over to national executing agencies. But such discretion must be tempered by insisting on coherence and consistency with agreed standards. Nationally, the ICP must be run by the agency or agencies responsible respectively for national accounts, price data collection and index number compilation.

The governance arrangements for this round of the ICP were developed with these considerations in mind. The key elements of the governance arrangements were an ICP Executive Board, a Global Office, a Technical Advisory Group, and Regional Implementing Agencies (often referred to as Regional Offices) who were responsible for implementation and monitoring the program at the regional level.

Europe and the OECD countries were managed somewhat differently because of the ongoing price comparison arrangements that existed for these institutions. The price comparison arrangements continued to be managed by Eurostat and OECD. The data from the ICP were merged with those generated by the Europe and OECD data collection activities designed to produce a single global database. To achieve this, close collaboration was needed between the global ICP and the program in Europe and OECD on technical and other matters. This was achieved by regular consultation between the ICP Global Office and the Eurostat and OECD representatives on the Global Executive Board and the Technical Advisory Group. In addition, the CIS states were incorporated into the ICP through Europe consistent with the normal arrangements that applied for Europe.

Methodological and other Innovations

The main innovations I would like to discuss here are the use of Structured Product Descriptions (SPDs), the approach adopted to pricing construction

and equipment, the Toolpack software package, the Ring Comparison used for linking the regions, and the production of the ICP Handbook and Operational Manual.

a) Structured Product Descriptions: The International Comparison Program is a highly complex operation. The complexity is further compounded by the program's international nature, which suggests that the optimum set of products for the international comparison may not necessarily be the ones a country would select for its own Consumer Price Surveys. For that reason, the procedure to determine the product specifications has been reengineered for this round by developing the Structured Product Description procedure.

The coding structure for the SPDs was prepared from three sets of materials— i) the 7 digit coding structure of the OECD/Eurostat classification of expenditures on the GDP; ii) the Classification of Individual Consumption by Purpose, which is an international coding system designed for household budget surveys and implemented in many countries; and iii) the US Bureau of Labor Statistics check list used for its Consumer Price Survey. The SPDs derived from this process were sent to the regional coordinators for their initial review. Their review resulted in additional characteristics being added that reflect how products are sold in developing countries. There are about 830 SPDs that cover 100 Basic Headings for individual consumption. Each SPD contains price-determining characteristics that will define unique products from any corner of the world.

The result has been a coding structure that can consistently define products anywhere in the world. The long-term benefit is that the coding structure will allow

a connection between products across different rounds of the ICP. It also provides a method for the harmonization of individual country lists used for their Consumer Price Surveys. If each country coded their CPI lists into the SPD structure, it would be easier to integrate the data collection for the ICP with the CPI and maximize the overlap between the two lists.

b) Pricing of Construction and Equipment: The approach used in the Eurostat/OECD comparisons is to price overall construction projects using “Bills of Quantities” for model construction projects. However, this approach turned out to be too complicated, time consuming, and expensive to be used in developing countries. Considerable effort went into developing an alternative approach termed “Basket of Construction Components”, which prices a smaller list of components rather than a complete set of building inputs. A major benefit of the new approach is that it can be used to build capacity in countries in pricing construction components for potential use in the construction sector.

A different approach was also taken to pricing equipment in this round, which resulted in much more consistent pricing across the participating countries. Basically, it involved a modification of the SPD approach where it allowed countries to price a product that had characteristics, which were different to the baseline product as long as the main technical characteristics of the product were present.

c) The Toolpack Software System: Once price data are collected, the system provides data-entry capabilities along with data validation routines. The system is designed in a way so that each country can submit

Lesson Learned

price data to the regional coordinators who will continue the data validation by comparing results across countries. Once the data are deemed “clean”, the system will compute the PPPs at the basic heading level and also the PPPs at the different levels of aggregation.

There are two critical features. It is a database system, which means all data can be stored in a consistent fashion for data validation and estimation. The database will be a valuable resource for analysis and research such as poverty measurements. The database will also provide the long-term storage capability. The Tool Pack is also a potentially valuable instrument for countries lacking expertise in processing price statistics and preparing price indices.

Not all countries used Toolpack in this round and hence its potential remain under-utilized.

d) *The Ring Comparison:* Product specifications are prepared for each region and independent sets of PPPs prepared for countries on a region by region basis. While this approach probably improves the quality of PPPs at the regional level, there is still the need to combine the regions in order to obtain a global comparison. The basic approach used in the past was to name a single country to price products in more than one region to “bridge” the PPPs. This procedure produced results that were greatly influenced by the pricing structure of the bridge country.

A new approach has been introduced for this ICP round in which the participating countries are divided into five regions. Product specifications have been prepared to optimize the comparison for each region by computing regional PPPs. In order to make the global comparison, a

6th region has been formed involving 18 countries known as the “Ring Countries.” The multilateral ring comparison requires those countries to participate in a separate comparison organized specifically to provide a link between regions. The Ring Countries priced a common global ring product list in addition to their individual regional lists. It is the regional prices obtained through this method which have been used to link the regions.

One exception is the CIS region. It was linked to the OECD/Eurostat comparison using a link country (Russia) as has been done in the past.

e) *The ICP Handbook and Operational Manual:* A handbook and operational manual, with input from internationally known experts, have been developed. The Handbook covers all aspects of the ICP and is a principal source of information about the program. The operational manual provides practical guidance on everything from determining the sample of outlet to the work plan and time table at the country level. They are statistical capacity-building tool that can be used by countries for their own price collections, and not just the ICP.

These innovations have been important for the success of this ICP round. But, as is usual with innovations, lessons have been learned, which can be used to refine them for future rounds.

Lessons learned

As described above, the ICP is the largest and most complex global statistical project ever undertaken. So it is natural that there are areas that need to be improved in order to achieve perfection. However, this should not be interpreted to conclude that this ICP round had been less than successful. The following are some of the key lessons.

1. No country can produce a Purchasing Power Parity (PPP) by itself and it shows that inter-country coordination is crucial. It is also essential to abide by the standards accepted by other countries, share data and procedures, and allow data to be subjected to review by others. While there were letters of agreement between regions and countries, and also between regions and the Global Office, these agreements fell short in defining the precise requirements. As a consequence, some countries did not fully comply with the ‘rules’ for participation in the ICP. This could be corrected for future roles.
2. There is a need to evaluate and more clearly define the roles of all the participants, particularly the Global and Regional Offices to ensure there is a common understanding. This is needed to avoid duplication and make sure that things don’t “fall between the cracks”. The devolution of responsibilities to regional bodies, with the co-ordination of the Global Office, worked well. This should be repeated but with some reflection on how things might work better in the future. One issue that came up was that for some regions there was not always a clear understanding of roles and responsibilities. Memoranda of Understandings are an important tool to address the issue, for they provide a documented record.
3. They are also an important part of the relationship between the regional offices and the national co-ordinators. But the Memoranda also need to be honored. The “penalties” for not doing so, unless mutually agreed, also need to be spelt out and pursued, if necessary. One outcome is that some countries will not be part of the official ICP. But estimates of PPPs will be required for them. Countries should not be allowed to choose whether

they are in the ICP or not. The choice should be whether their participation is based on data they have provided (assuming it is sufficiently accurate) or whether their participation is based on imputed data. This is not entirely satisfactory but probably better than relying on data that is clearly wrong or not having PPPs for some countries.

4. The quality of the 2005 ICP round will be far superior than was the case in previous rounds. But some problems still exist. The key quality concerns are because; (a) it is clear that in some cases comparable data are not being collected despite the concerted effort made to describe the items being priced; and (b) the expenditure breakdown of the GDP was not always reliable or comparable across countries. Concern (a) applied to both comparisons within regions and the ring comparison across regions. Outliers are relatively easy to manage as long as there are not too many for a single country. Some valuable experiences were obtained in this round on how to better manage outliers, which should be utilized in the next round.

With respect to concern (b), while the primary work program for the ICP involves the collection of prices, the final result is the use of PPPs to deflate national GDPs into a common currency so that per capita and structural comparisons can be made. These comparisons lose their credibility if the national accounts, and breakdowns into expenditure categories, are weak. Also, the expenditure breakdown is used to weight prices and it will impact PPP comparisons across countries if the expenditure breakdowns are not compiled on a consistent basis. Insufficient attention was paid to the quality of the national accounts in the early parts of this round.

5. Budget affordability is a key issue.

This applies globally, regionally and nationally. We should not look at simply repeating the 2005 ICP on a periodic basis. Ideally, future ICP rounds should be more frequent and less expensive. This can be achieved if the ICP is more closely aligned with the prices and national accounts works of National Statistical Offices. In effect, this is what happens with the three-yearly OECD/Eurostat comparison. For them, the additional effort required for the price comparison is relatively small. Most of the required data is already collected. This strategy may require a reduction in the number of consumption items in the ICP.

Such a strategy has a number of benefits:

- i) Clearly, it reduces costs on countries.
- ii) The continuity of arrangements will make it easier for global, regional and national offices to manage more efficiently.
- iii) It will be easier to maintain the necessary expertise at all three levels.
- iv) Technical capacity-building effort will be closely aligned with important prices and national accounts programs, which are already subject to much technical assistance.

No doubt, it will also introduce some new challenges.

6. On a related issue, for many countries it was not easy to take on the additional data collection effort to collect prices for several hundred items outside their CPI basket. Expectations with regard to their capacity should be reduced in future rounds. They have lacked the resources and infrastructure to collect the required data and/or there were difficulties with national accounts data. Capacity-building has been a clear objective of the ICP and it has helped countries make

some headway, particularly in Africa.

7. The knowledge and expertise required to organize and coordinate a complex statistical program is available in the National Statistical Offices of many countries, often more so than in the regional and international organizations. Some partnering arrangements were put in place for this round (eg., support was provided by Statistics Canada in Latin America, the UK Office of National Statistics and IN-SEE in Africa, the Australian Bureau of Statistics in Asia, and Rosstat in the CIS Region). More extensive partnering arrangements should be sought from the very beginning for future rounds including some aspects of the work of the Global Office.
8. Another aspect that needs to be examined in the future is how the ICP might be improved to provide better data for poverty analysis. One of the main applications of PPPs is to improve the accuracy of poverty analysis. Having accurate national PPPs is a major step forward. But research has shown that data on the prices paid by those at risk of poverty is also important.

Conclusion

This ICP round has been a success and clearly superior to previous rounds. The new governance arrangements, the efforts to improve cohesion and new methodologies have all made an important contribution. Whilst there is scope for improvement, the next round should build on the current round's successes rather than go through a major rethinking of the existing arrangements.

Finally, I would like to thank all those who have contributed to making the 2005 ICP such a resounding success. I will not single out any particular individuals because it has definitely been a team effort that ultimately led to its great outcome.



Enrico Giovannini
OECD,
ICP Executive Board

25 Years of Purchasing Power Parities in the OECD Area

Parity in calculation... but disparity in understanding

The OECD and Eurostat have been dealing with PPP computations for almost quarter of a century. First published in 1983, PPPs are today well-established in the OECD/Eurostat statistical work. They are used in research and analysis but more importantly, in economic policy, notably in the context of allocating structural funds in the European Union. PPPs in the OECD area have now been complemented by worldwide results from the International Comparison Program (ICP).

PPPs constitute an important tool for measurement. But this does not mean that PPPs are always applied where they should be applied; nor does it mean that when they are used, they are always well understood. To illustrate the point, let us look at two recent press reports. In January 2008, the Financial Times states that:

"The size of the British economy has slipped below that of France for the first time since 1999 thanks to the slide in the value of the pound."

The research agenda that the ICP supports ranges from health and education PPPs, to measurement of regional income, to the use of PPPs in emission scenarios. It can confidently be stated that PPPs count among core statistical tools whose computation and development will remain on the work agenda of national and international statistical agencies for years to come.

The FT quote underlines a case where PPPs should be used rather than exchange rates. It is, however, not very helpful to reason about the 'size' of an economy, if the size shrinks or expands simply as a consequence of movements on exchange rate markets. Converting GDP into national currency with PPPs does away with the volatility of exchange rates and produces volume comparisons of economies – just like price indices are used to make volume comparisons of the British economy over time.

About the same time, The Guardian under the heading Italy Denies Being Spain's Poor Relation reports on a discussion about the Italian GDP per capita income relative to Spain:

"There are Lies, Damn Lies, and Statistics. EU's statistical office, Eurostat, suggested Italy's gross domestic product per head had slipped behind that of Spain, allowing for price differences. Italy's prime minister, Romano Prodi, has responded with a cry of foul, and claimed Eurostat's number-crunchers had got it wrong, and 'in per-capita terms our GDP is about 13% higher than Spain's'. Prodi, a former economics professor, and until three years ago was the head of the European commission, the body responsible for Eurostat, said 'everyone knew' calculations that allowed for so-called purchasing power parity were 'entirely fickle', because there was no agreed method for measuring it."

The Guardian quote reveals not so much a misunderstanding about the nature of PPPs but as a misunderstanding about how they are constructed. There is and has been an agreed method for measuring PPPs in the OECD-Eurostat comparisons and – some finer details apart – it is compatible with the methodology used by the World Bank.

But the two quotes highlight a broader issue: PPPs are useful and important but hard to communicate. Consider two other examples. The first one relates to PPPs in a currency area. It is well established but not widely understood that even within a currency area such as the Euro zone, PPPs are useful for volume comparisons (see Box). In fact, exactly the same *raison-d'être* that holds for calculating PPPs within a currency area can be applied to PPPs within a country.

The second example for the problems that arise with communicating about PPPs relates to over-interpretation. PPP conversion rates rely on the comparison of prices of a basket of goods and services across countries. However, any such comparison has to strike a fine balance between finding products that are truly comparable between countries

continued

and those that are representative for the universe of products in a given country. This is no small task and involves approximations and assumptions that make PPPs a useful but not overly precise tool for comparisons. In particular, when countries are clustered around a very narrow range of outcomes, it may be overstretching the information contained in PPP-converted income measures to establish a strict ranking. For example, the above-mentioned debate on Italy versus Spain is a debate about 500 dollars of income difference per year and per inhabitant. And this income difference should not be put in relation to disposable household income per capita because it comprises all components of GDP.

12 The research agenda ranges from health and education PPPs...

Although the quality of PPPs increased over the last 10 years, the research agenda for PPPs is still broad. Only three areas will be mentioned here. The first one is PPPs for non-market services, in particular health and education. What is the issue? To date, the volume of health and education services that are produced by government, is measured by the inputs (labor, capital, etc.) needed to provide them, and not by outputs such as the number of treatments or the volume of studies successfully completed. OECD and Eurostat are presently working on developing a new set of PPPs for these fields. These PPPs aim at measuring the unit value of outputs rather than of underlying inputs so that the volume of services can be better compared across countries.

...and measurement of regional income...

Poverty measurement is an issue that

has been driving the worldwide ICP comparison. Only when relative price levels between countries can be pinned down, is it possible to make statements about the volume of consumption per capita in different countries. A related argument can be made for real income comparisons of sub-national entities, in particular when there are large disparities in price levels of regions within a country. In such a case, using national PPPs that reflect the average price level of the country to compare income of regions may not produce an accurate picture about a region's real income. In those regions where nominal income is low, and typically combined with a low price level,

calculations with average national PPPs may lead to underestimating real income. The opposite would be true for relatively high-income parts of a country.

...to the use of PPPs in emission scenarios

The last point to be mentioned for the research agenda relates to the use of PPPs in environmental analysis, more specifically in computing emission scenarios. Obviously, the level and evolution of greenhouse gases is closely linked to economic activity and to the size of economies. A lively debate has arisen on the question about how best to measure the size of economies. In-

Until 1999, in the OECD area, national territories and currency areas were identical in the majority of cases. Since the introduction of the euro, this has changed markedly and 15 countries now share

price convergence or absence thereof in the single currency area.

Second, from a viewpoint of symmetric treatment of countries, using country-specific PPPs across the 15 countries would be similar to using an average of regional PPPs for other single countries,

Are PPPs obsolete in single currency areas?

a common currency. Does it still make sense to compute PPP measures for each national territory? Or should there be a single PPP measure that converts the euro into other currencies?

In fact, two issues arise here. First, from an economic viewpoint, there is no need to abandon country-specific PPPs for the euro area. One euro may very well have different purchasing power in different parts of the euro area and so buy more or less of the same bundle of goods. It is certainly interesting to find out whether a salary of € 3 000, when paid in Finland, buys the same volume of goods and services as it does when paid in Germany or Greece. In principle, the evolution of PPPs within the euro area over time could be a tool to monitor

for example the United States. But – unless every region has identical patterns of expenditure – a weighted average of regional PPPs does not correspond to a PPP that has been conceived of the country as a whole. Thus, symmetric treatment of single countries requires that there be only one PPP, representative of the euro area as a whole.

To sum up, country-specific PPPs do not lose their relevance in a single currency area. At each country level, PPPs cannot anymore function as currency conversion rates – their value lies in comparing price levels and purchasing power within a zone. But symmetrical treatment of countries has to be assured when forming zone totals or when carrying out cross-country comparisons.

deed, as pointed out earlier, whether the size of an economy is measured using PPPs or exchange rates can make a considerable difference to emission scenarios and analysis. The research issue, however, goes beyond the question of which conversion factor should be used to compare the size of economies today. Here, the thorny bit lies in making statements about how PPPs will evolve over the long-term horizons for which emission scenarios have been built. Simple extrapolation may not be sufficient, and more research will be needed to pin down concepts and numbers for this question.

Other relevant questions could be raised where PPPs are potentially useful and where research may be needed, for example, PPPs for particular socioeconomic groups but it would take us too far to develop these thoughts here. However, it can confidently be stated that PPPs count among core statistical tools whose computation and development will remain on the work agenda of national and international statistical agencies for years to come.

Looking ahead

In addition to the research work mentioned above, ongoing PPP work will continue in the OECD/Eurostat program, although some changes are on the horizon. The set of countries included will be slightly different if the accession process engaged by the OECD for five new members – Chile, Estonia, Israel, Russia and Slovenia—goes ahead. Also, further coordination will be sought with the PPP work in the CIS countries. At the same time, worldwide comparisons will further gain in importance, and the present ICP results, useful as they are, would benefit from regular updating. To the extent that the OECD can contribute to such efforts, it will do so. ■

The 2005 ICP has passed its final milestones!

The preliminary global data were released on 17 December 2007 with considerable coverage by the national and international media. The report included PPPs and related measures for gross domestic product, actual individual consumption, collective government consumption, and gross fixed capital formation. The report and the briefing materials stressed the international partnerships that brought together the ICP regions and the Eurostat and OECD comparisons.

The data have now been finalized and were posted to the ICP website on 27 February 2008 (www.worldbank.org/data/icp). The tables show total and per capita expenditures for 15 components of GDP, plus the corresponding PPPs and price level indices. The final data for the components previously published remained essentially the same.

ICP 2005 represents the world's largest and most complex statistical undertaking. The general management of the global program was coordinated by a Global Office housed in the World Bank, and in five ICP regions and in Eurostat and OECD member countries by the relevant implementing agencies. The global estimates were made possible by linking the regional and OECD/Eurostat PPP estimates using the so-called “ring method,” which had never been used before. This required intensive collaborations prior to the preliminary data release among the regional coordinators, Eurostat-OECD, the technical advisory group, and the global office. Many difficult decisions had to be made on how to link the different components of GDP across the regions. The basis for these

decisions has been documented and will be included in the final report.

During the past year, an evaluation of the ICP 2005 was conducted by a Friends of Chair (FOC) working group appointed by the UN Statistical Commission (UNSC). The FOC group is comprised of 22 national statistical agencies, international and regional organizations and headed by Statistics Norway. Their report presented to the 2008 meeting of the UNSC was very positive about the success of the 2005 round and included several recommendations for the future of the ICP. The UNSC discussed the evaluation and heartily endorsed the recommendations. The key recommendations were (i) to continue the ICP with 2011 targeted as the next benchmark year, (ii) to continue to cover the full GDP (iii) to request the World Bank to host the Global Office, and (iv) to encourage the regional organizations to continue their coordinating role.

We and our partners did our best in bringing this project to its successful completion. That said, we still believe that there remains further scope for future improvements; however, a process is already in place for continuous data improvement that will help shape the next round. In closing, this will also soon bring my term as the Global Manager to closure. It has been a great privilege and honor to work with the giants of the ICP. My best wishes to all for a fully successful 2011 ICP. ■



Fred Vogel
World Bank

Samuelsson ... continued from page 1

All evolutionary science is a group effort. For decades, Irving Kravis recruited a workshop of talented co-workers at the University of Pennsylvania. Alan Heston and Robert Summers worked with Kravis for many years and continue to work on the project after his passing. The Kravis team needed many years of group effort in order to compile realistic prices and related purchasing power parity estimates for scores of geographical regions, which differed much in degree of affluence and poverty.

All researchers in economic development and economic history become blessed when they could use meaningfully measured real GDP. In the early

All researchers in economic development and economic history become blessed when they could use meaningfully measured real GDP.

14 editions of my *Economics*, I had to resort to vulnerable crude approximations; if a haircut cost 10 cents in India and \$10 in Muncie, Indiana, then may be U.S. real wages were 100 times India's real wage. Such early pioneers like Colin Clark guessed about similar approximations. In workshops everywhere – Barro's at Chicago and Harvard would be one excellent example – saws and chisels could dig out regressions using ICP data. In *Economics's* later editions my readers learned, thanks to PPP data that the Penn World Table availed, that the US was not twenty times as prosperous as India or Indonesia.

New methodologies usually meet resistance. Early on, I asked a pal of mine who was Chief Economist at the World Bank: "why the Bank is so slow to publish purchasing power parity data?" His reply was pragmatic: "Reluctance to change existing practice and pressure from poor countries who are worried about the implications of PPP data in aid allocation does delay, but not permanently, our employing best possible methodologies."

For the sake of brevity, I will conclude by what is the highest praise for the ICP. Successive editions of my textbook were based on U.S.S.R. data that were provided to me by Abram Bergson, dean of Kremlinologists in the West, and by the civilian branch of the CIA. From those sources, estimates came that per capita living standards in the U.S.S.R. were somewhere between one-third to two-thirds of U.S. standards.

Yet after the Berlin Wall came down and the Cold War abated, the Soviet numbers I had published were deemed to be too high. Fun loving Daniel

Moynihan, late Senator for New York, lampooned my credibility. All

I could do was say "Touché." But under my breath I muttered: If the Kravis-Summers-Heston gang could have provided timely and relevant PPP, our frontier economic knowledge would have been more exact and more socially useful.

Today's scholars owe a lot to, say, theorists like Pareto. And, speaking of myself, I feel similarly to the Kravis group at the University of Pennsylvania. May the World Bank team keep up the tradition! ■

The ICP is 40! Many happy returns.

Angus Deaton, Princeton University

Fifty or a hundred years from now, when there is a good history of economics in the twentieth century, my guess is that data will play the starring role. Over the last thirty years, more data and better data have fundamentally changed the practice of both microeconomics and macroeconomics. No new data have been more important and more influential than those from the ICP. By the late 1960s, the theory of economic growth that has begun with Solow's great paper had become a largely theoretical enterprise, with more models than data points. But by the late 1980s, as the Penn World Table moved from a small set of illustrative calculations into a multi-country panel that was big enough for econometric analysis, a new empirical growth economics was born. There has been a huge explosion of work since then, trying to understanding the mechanics and determinants of growth, linking growth and politics, and forging a real integration of macroeconomics, economic development, and economic history.

For those of us who are interested in measuring well-being, we have at long last a common measuring rod that allows us to compare, not only India and America now, but India now with Britain before the industrial revolution, or even to conjecture about which places and which times have seen the greatest riches and the greatest poverty in human history. None of this would have been possible without the intellectual contribution of the ICP and the ever improving database that has accumulated with every round. Bravo!

Professor Deaton is a consultant to the ICP, and is President Elect of the American Economic Association.

Lucas ... continued from page 1

It must have been similar lack of international data that led us to interpret Robert Solow's 1956 paper, "A Contribution to the Theory of Economic Growth" and the dozens of models it inspired as suited to advanced economies only. When Solow, Edward Denison, and others began to use the theory to quantify the contributions of capital accumulation, schooling, and other factors to growth, they relied on then novel long time series for the United States.

Their methods could be applied to data from the U.K., Japan, and the few other economies for which long time series, based on standard national accounting principles, were available. Were they applicable to the poor economies in Asia and Africa too, or were those countries subject to some other kind of economics? If they were not, why weren't more of them converging to advanced-economy income levels at the rate predicted by the theory? In the absence of the kind of data that would let us make progress on such questions, growth theory became largely a training ground for theorists and development economics remained dominated by case studies.

Of course, there were exceptions. Anne Krueger's 1968 paper "Factor Endowments and Per Capita Income Differences among Countries" was an important, pioneering cross-country application of growth accounting methods. But it was an exception to prove the rule.

When I described the Krueger results to a colleague recently, I was told "That's impossible! Where would she have got the data?" I could only say that she didn't have much, and it could not have been easy to get them together.

All of this began to change with the introduction of the World Development Report in 1978, providing assessment of global development issues along with a comprehensive statistical annex. I remember getting myself assigned an undergraduate class in economic development in the early 1980s, just to have an excuse to spend some time with all these numbers.

Successive versions of the Penn World Tables brought many improvements to international data based on Purchasing Power Parity estimates, and stimulated independent scholars like Robert Barro and Jong-Wha Lee to construct compatible series on important variables that had been left out. The beautiful Excel files provided by Angus Maddison and the OECD must be on every computer in the world.

These developments have raised the quantitative level of economic discussions everywhere, from lunchtime conversations and news magazines to the frontiers of economic and econometric research on economic growth. Theoretical models of trade and growth have begun to exploit the panel character of the international data sets.

They have vastly enlarged the set of questions that can be addressed by economic and statistical analysis. And they have, in turn, raised the value to all of us of further improvements in scope, coverage, and precision. ■

Globally comparable data have raised the quantitative level of economic discussions everywhere, from lunchtime conversations and news magazines to the frontiers of economic and econometric research on economic growth. Theoretical models of trade and growth have begun to exploit the panel character of the international data sets.

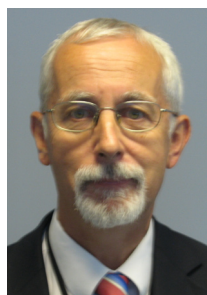
Call for Articles

One common theme that has emerged out of this commemorative issue is that the program has taken quite a leap during the 2005 round, but there are still "significant rooms for taking a fresh look" at some outstanding theoretical, methodological and practical concerns.

The Bulletin extends an invitation for original articles that reexamine current practices or venture to challenge conventional thinking and shed new light on lingering problems. Papers on analytical uses of PPP are most welcome, as are papers on institutional, organizational and operational aspects of the ICP. Please send submissions or questions to ybiru@worldbank.org.



Ben Whitestone
UK Office for
National Statistics



David Fenwick
UK Office for
National Statistics

Supporting the ICP: Organizational Partnerships

The credit for the success of the 2005 round of the ICP goes largely to the effective collaborations between different international, regional and national organizations. The ICP is a highly complex international program, which by its very nature calls on wide-ranging input from many different parties. The work involved can be especially challenging for countries and regional coordinators, particularly where statistical capacity and the accompanying available resources at a national level are limited.

In order to ensure delivery of the global and regional ICP results, and to relieve the burden on regions/countries where resources are stretched, the 2005 round has seen a number of 'partnerships' between regional programs and National Statistical Institutes (NSIs) from outside of that region. One such example is the UK Office for National Statistics (ONS) ICP-Africa Support project, funded by the UK Department for International Development (DFID). The UK-ONS supported the project through the provision of direct technical assistance aimed at ensuring the successful participation of Africa in the Global ICP and facilitating longer-term statistical capacity-building. This article outlines the ONS support project and discusses its achievements in the context of assessing whether similar arrangements should be considered for future rounds.

Although this article will focus on the support given by ONS to ICP-Africa, there were three other partnership arrangements in place during this round, which were

similar in motivation but different in the detailed delivery. These partnerships arose out of different reasons and in different sets of circumstances and followed different constitutions, but were common in their goal to support the regions in producing high-quality results. The arrangements involved the following organizations:

1. Institut National de la Statistique et des Études Économiques – France : INSEE provided technical support to Francophone nations in Africa.
2. Australian Bureau of Statistics (ABS): ABS played a crucial role in the initial phase of conceptualizing ICP Asia Pacific and subsequently took responsibility for developing the household product list for the region. A representative of ABS also served as a member of the ICP-Asia Pacific Regional Advisory Board, which is charged to provide technical and strategic advice.
3. Statistics Canada: It took on the role of joint regional coordinator with the Economic Commission for Latin America and the Caribbean for the South America regional program.

The ONS-UK ICP-Africa support project Overview

Since March 2005, the ONS has been managing a three-year ICP-Africa support project, funded by the DFID. The overall goal of the project is to facilitate a positive outcome of the ICP in Africa and to effectively exploit ICP-Africa as a catalyst for sustainable statistical capacity-building

In order to ensure delivery of the global and regional ICP results, and to relieve the burden on regions/countries where resources are stretched, the 2005 round has seen a number of 'partnerships' between regional programs and National Statistical Institutes (NSIs) from outside of that region.

Building Partnerships

in the longer-term. The ONS support to ICP-Africa mainly focused on Anglo-phone African countries.

The project has worked in close partnership with the African Development Bank (AfDB). By providing technical assistance directly to African countries at regional and sub-regional workshops and to AfDB, it has made good progress toward its goal of Africa's successful inclusion in the ICP global comparison. The ONS has provided support directly to 18 African countries, focusing on the two main requirements for the successful computation of purchasing power parities for the ICP: i) the collection of good quality price data and; ii) the effective exploitation of all available National Accounts and Household Budget Survey information for use as weights.

Specific ICP support provided by the project has encompassed the following:

- Technical assistance was provided through missions to selected countries in order to assess overall ICP understanding and readiness, and to ensure the basic quality of price survey frameworks, price collection practices and validation practices as well as the construction of expenditure weights
- Regional/Sub-regional support: This included employing expert consultants to: attend and contribute to regional and sub-regional seminars on prices and national accounts; provide direct support to sub-regional organizations in order to assist them in completing their ICP objectives; assist with the validation of ICP data; and support AfDB on the compilation of results and production of the preliminary and final publications.
- Strategic Guidance: Through 'partnership meetings' with AfDB,

the ONS and the World Bank provided input into discussions on progress, strategic direction, methodology and future support.

Work on the project's second objective -- to exploit the investment in ICP-Africa as a catalyst for sustainable statistical capacity-building in the longer-term and to contribute to the goal of an improved and sustainable evidence base for country-level decision-making -- has focused on: facilitating improvement in national CPIs through the integration of ICP methods; supporting the harmonization of CPIs across African sub-regions; producing a supplementary handbook to the ILO manual on Consumer Price Indices focussing on the practical measurement issues confronted by the developing world; and exploring the use of data collection technology to improve African CPIs.

How the project was organized

The project was managed by ONS and led by a steering group consisting of ONS and DFID personnel. The group was chaired by an ONS project director, who also provided day-to-day direction. The steering group met at least every six months and its main role was to assess progress and chart future direction.

Day-to-day management and coordination of the project had been through an ONS project manager who had also submitted regular progress reports to the steering group.

There had been regular 'Partnership' meetings between ONS, AfDB, the ICP Global Office and INSEE. These meetings proved to be a very effective method for sharing information on the status of ICP-Africa, assessing progress and discussing the future work-program (See below for more detail).

The core workforce for the direct-to-

country technical assistance consisted of consultants from NSIs and International Organizations, who had practical experience in prices and/or national accounts. These consultants could be drawn upon to provide support on critical objectives at key times, and sometimes at short notice, in a way which would not have been possible if the workforce was ONS staff alone. Even though the project was not merely reactive and did undertake forward planning, some 'fire-fighting' is necessary for a project of this type, and the ICP-Africa Support Project's ability to be flexible in such circumstances is one of its key successes (see below).

How the project helped

The project has contributed significantly to the ICP-Africa program and represents an effective method of providing support to such initiatives. Aside from the more specific achievements of technical assistance at a country level, some key advantages of the project in relation to the ICP support it has given during this round are detailed below:

- The project provided an additional and distinct resource for ICP-Africa, which could be drawn on where the specific expertise required was not available or to allow AfDB and/or the ICP Global Office to focus on other priorities.
- The nature of the project meant that its resources were often more flexible and easily mobilized than those that were practically possible under the direction of AfDB. It could therefore provide direct support to countries at short notice and with minimal administrative burden.
- The project's location within ONS meant that it could draw on the expe-

continued

rience of UK statisticians in various areas including Prices and National Accounts as well as from those working on the Eurostat/OECD PPP program and on the ICP through the UK's involvement as a 'ring' country. This facilitated the effective sharing of information and knowledge transfer.

- The project provided experienced internationally acclaimed experts to attend regional and sub-regional ICP seminars/workshops. These independent consultants were able to add significant value to the discussions and provide helpful insights.
- The project led to the sharing of expertise and knowledge between organizations and also informal training, especially when experienced consultants worked directly with countries.
- Part of the governance of the project consisted of regular meetings with AfDB, the ICP Global Office and INSEE. These meetings proved to be a very effective method for sharing information, assessing progress and discussing the future program.
- The project operated on a number of levels providing specific technical support to countries but also fa-

cilitating the sharing of ideas and planning at a more strategic level through a four-way meeting with World Bank, INSEE and AfDB.

- Since the UK, through ONS, was involved in the ICP as a ring country, a ring coordinator (for Eurostat/OECD) and a member of the ICP Executive Board, as well as its involvement in ICP-Africa, this greatly facilitated the sharing of information across the program. The presence of ONS on the ICP Executive Board, in particular, provided a stronger voice for ICP-Africa, which was helpful when addressing Africa's concerns as well as more generally providing the ICP Executive Board with feedback on the practical problems being confronted by ICP participants.

The project committed the bulk of its resources toward supporting the ICP. At the same time, it was also able to carry out some statistical capacity-building projects. The objective of this work was to add to the sustainability of the investment in the ICP (both in terms of money and expertise) in order to make advances in statistical capacity that would leave a lasting legacy. Work in this area focused on the following:

- A study of the feasibility for the integration of ICP components into national CPIs and the sub-regional harmonization of CPIs, in order to inform future direction.
- A supplementary handbook to the UN Manual on CPIs focussing on providing practical advice to developing countries (currently under development).

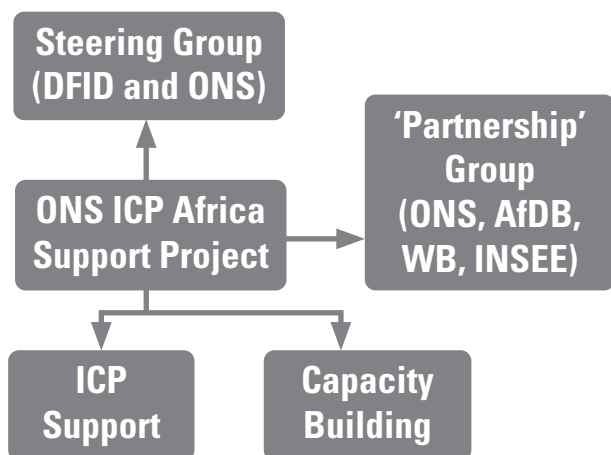
- Two pilot studies into the use of hand-held computers for the collection of prices data, carried out in Nigeria and Uganda.

Aside from these specific projects, there was the general transfer of knowledge from ONS staff and consultants to colleagues at African NSIs.

Why the project worked well

The following factors contributed to the success of the ICP-Africa Support Project:

- **Project Management:** At an operational level, the project was closely managed and coordinated. This was achieved by having a dedicated manager at ONS, who coordinated all aspects of the project. Equally important was the close contact between the ONS and DFID, as well as the use of strong project management processes to control the project.
- **Communication:** A key to the project's success and to its ability to provide a successful input into ICP-Africa was regular and open communication between all parties (ONS, DFID, AfDB and World Bank in particular). This regular and open communication was achieved by regular meetings, progress reports and frequent email correspondence. Although there was no substantial relationship between the ONS and the AfDB prior to this project, an effective working relationship was established quickly, paving the way for successful coordination, planning and the resolution of issues.
- **Partnership Approach:** The ONS support project worked very much in partnership with other organizations, particularly AfDB, throughout the course of the program.



Again, the strong relationship that was developed meant that all the organizations involved were aware of working toward a common goal.

- **Shared and compatible objectives and a common understanding of roles and responsibilities:** This involved clear communication from the outset and mutual respect.
- **Relevant Expertise:** The ONS procured the services of experts (both from within the UK's Statistical Service and international consultants) with extensive experience in the subject areas. These experts were able to add significant value whenever they were called upon.
- **Continuity:** The project's duration of three years and with a team which was in place for the full period provided enough time to develop strong working relationships and maintain continuity through the duration of the ICP. A project of a much shorter duration (say 1 year) would not have had the time to build these important relationships.

Alternative methods of support

INSEE support to Francophone Africa

This round of the ICP also saw INSEE providing technical assistance to 16 Francophone African countries. INSEE did not have a distinct project of support in the same way as the ONS, but provided technical assistance and advice through already established mechanisms. INSEE used permanent grants (from the International Cooperation Ministry and ADETEF) to finance their support.

INSEE were also involved in 'partnership meetings' with AfDB, ONS and the World Bank, which acted as a forum for discussions on progress, strategic di-

rection, methodology and support. The assistance provided by INSEE usefully complemented the support provided by ONS, particularly where common technical issues affecting the whole of Africa were being addressed.

ABS support to the Asia-Pacific region

The ABS did not have any formal agreement in place with the ADB but the two agencies worked closely on a number of ICP activities.

This arrangement differs from the ONS support to ICP-Africa as ABS mainly focussed on the development of the regional household product list. The development of the product list was carried out by a small team of ABS prices experts who, following inputs from price statisticians in the participating countries and through several regional workshops, formulated a draft list of representative and comparable household products for the Asia-Pacific ICP. This draft list was then translated into a final list through regional workshops.

Alongside the specific task of developing the household product list, ABS also provided input into the regional data review through attendance at ADB regional workshops; contributed as a member of the Regional Advisory Board; and provided some specific technical support through the estimation of 155 basic heading level national GDP expenditure weights for the People's Republic of China and as a member of the Expert Group on extrapolation.

Statistics Canada support to the South America region

The role of Statistics Canada in the South America region was one of far greater direct responsibility for the program than the ONS, INSEE or ABS arrangements. For the South America region, Statistics Canada shared overall responsibility for regional coordina-

tion with the Economic Commission for Latin America and the Caribbean (ECLAC).

While nominally the responsibility for coordination of the South America region was shared with ECLAC, the latter did not have a distinct budget for the ICP and hence could only provide minimal support. Therefore, Statistics Canada provided five staff to assist the regional coordinator carry out the key activities of the ICP.

Statistics Canada's staff, under the leadership of the coordinator, were responsible for: the organization and scheduling of the project; the adaptation of the product list to South American conditions; the training of staff where required; verifying and correcting prices; examining the integrity of the GDP components; and for reaching a consensus among the participants once PPPs were calculated and GDPs in real terms were estimated. Statistics Canada's staff also helped to test and improve software developed by the World Bank for the exclusive purposes of the ICP.

This model represents a far greater level of involvement, in terms of responsibility for the region, than the other arrangements outlined above. In fact, Statistics Canada's staff seconded to the ICP provided the leadership, the operational capacity and the technical knowledge to the project.

Conclusions

The partnership arrangements in the 2005 ICP round have greatly benefited all the parties and have contributed significantly to the delivery of regional and global results.

However, depending on the region, which type of partnership arrangement is most effective may differ. In Africa, the regional coordination by AfDB was particularly essential, given the geo-

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graphical size and diversity of the African continent. At the same time, the ONS support project was equally effective. Although it was not merely reactive, it was able to provide a flexible resource which could be called upon to solve pressing and unforeseen issues and provide specific technical assistance. Alternatively, in South America, the relatively small number of countries involved (10 countries compared to over 40 in Africa) and limited resources at ECLAC meant that Statistics Canada had taken on more overall responsibility for the coordination of the regional program.

Some of the arrangements have been managed more formally than others. For example, the ONS model involved a formal arrangement and Memorandum of Understanding between the supporting organization and the regional coordinator. The ABS and INSEE methods were managed more informally and through existing relationships, where operational arrangements already existed. In the case of South America, there were no formal arrangements in place between ECLAC, Statistics Canada, NSIs and the World Bank.

In all cases, the success of such arrangements is highly dependant upon effective working relationships between staff across organizations, particularly those providing the support and the regional coordinator. In the case of the ABS support, the relationships with ADB were to a large extent already well established prior to the ICP, whereas the relationship between ONS and AfDB had to be developed during the early stages of the program.

While benefiting regional coordinators and countries through providing additional support, there are also benefits to the organization supplying the assistance. Such arrangements can be a good opportunity for NSI staff to gain

experience working on the ICP and with other NSIs, regional and international organizations. These can be seen as capacity-building to both the organization receiving the support and the one providing the support.

On the whole, the partnership arrangements have contributed significantly to the aim of the ICP in improving the capacity and capability of both the individuals and the organizations involved in the program. However, in the case of South America, it remains to be seen whether the project has contributed as much to lasting statistical capacity as the nature of this level of support would suggest less 'grass-roots' capacity-building. During the course of the program in Africa there was a clear capacity-building objective, which was not the case for South America.

The ONS support project also focused on the building of longer-term statistical capacity and on the sustainability of the significant investment in this round of the ICP. There is still some work to be done to ensure that the knowledge, expertise and statistical capacity that have been enhanced through the ICP are not diminished after the end of this round. This should also perhaps include the continuation of the strong partnerships that already exist.

Looking back on the ONS experience raises the question of whether any lessons were learned, which may have implications for future partnerships for the delivery of technical assistance. One important point to make in this context is that the ONS support project was only initiated in March 2005 at which time the planning process was complete and the ICP already entered into its data collection period. The usefulness of the project could have been further enhanced if it was in place earlier in the process and could therefore have pro-

vided support throughout the full cycle of the program. An earlier start would certainly have better facilitated forward planning at the initial stages where ONS involvement in ICP-Africa tended to be less proactive and more reactive. The overall success of the various partnership arrangements during the 2005 round is a strong driver to see similar arrangements in place next time and to ensure that they are implemented early for any future rounds of the ICP. ■

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Statistical Capacity Building and ICP

Reliable statistics on social, economic and financial indicators are vital to the activities of the Islamic Development Bank (IDB), a triple-A Jeddah-based multilateral institution established in 1975. These statistics are used for preparing appraisal reports, planning and allocating resources, mitigating risk, undertaking research and studies. At the same time, they are also crucial for monitoring progress of international and institutional initiatives like the Millennium Development Goals (MDGs) and the IDB 1440H Vision. This article discusses IDB's statistical capacity building (IDB-STATCAP) initiative and its relevance to the International Comparison Program (ICP).

Of the 56 countries in the membership of IDB, 28 are classified as least developed member countries (LDMCs). Their data needs are indeed more pressing as they require timely and reliable statistics to respond to their socio-economic situation, plan and allocate budget, implement national development strategies, determine sectors needing urgent attention and meet demand from the international community. Unfortunately, they lack the capacity and resources to collect, manage, analyze, publish and disseminate good quality and timely statistics required to support national and international initiatives such as the PRSP and MDGs. The national statistical agencies in the LDMCs suffer from inadequate resources (finance, human capital, and infrastructure), contributing to their underperformance. Predictably, this has also hampered their data supply capability, forcing the international community to make do with whatever data are available. The consequences are all too familiar: the indicators for translating and monitoring progress of key goals would be chosen based on available data and not those that are most appropriate for the goals.

The demand for quality statistics in IDB has increased significantly in recent years, especially after the Board of Governors approved the establishment of a \$10-billion Islamic Solidarity Fund for Development.

For the Fund to be truly effective, solid statistics are required to quantify the number of poor people in member countries, who are they and where do they live so that development assistance can be specifically tailored to target them. In this respect, the current ICP initiative to strengthen poverty-specific-PPPs is a welcome development.

To illustrate the problem, out of 56 member countries only 14 had two data points available over two periods – one in 1990-1994 and one in 2000-2003-- on \$1-a-day indicator and more than half of the members (29 countries, to be precise) did not have the data over the same periods. In fact, the number of member countries with \$1-a-day data decreased from 22 in 1990-1994 to 19 in 2000-2003, while those without poverty data increased from 34 to 37 over the same period. This underscores the need to scale up statistical capacity in member countries, in general and in LDMCs, in particular.

In order to address these challenges, the IDB organized an Expert Group Meeting (EGM) on Statistical Capacity-building at its headquarters in Jeddah on 29th April 2007. It was attended by representatives from selected member countries' national statistical offices, OIC-statistical institutions, regional statistical institutions, and IDB staff.

The objectives of the EGM were to identify cross-cutting statistical capacity-building initiatives; discuss issues and challenges facing statistical development in various member countries; strengthen coordination of statistical activities with a view to creating synergies and avoiding duplication of efforts; and develop a common framework for sustaining coordination of data collection activities and harmonization of methods for computing aggregate statistics.

The EGM recommended a set of actions for IDB, which included: (i) setting up a special Technical Assistance Facility/Fund to support statistical capacity-building, (ii) creating opportunities for statisticians

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... The IDB has a considerable stake in the International Comparison Program as it provides a critical information base for the core areas of its work program in socio-economic development.

... The IDB looks forward to participating in the next round.

from underdeveloped countries to learn best practices from their peers and share experience of highly developed countries in the field, (iii) establishing a working group, in collaboration with relevant OIC institutions, to meet regularly to harmonize statistical activities, exchange experiences and best practices, develop common methodologies for collecting data from member countries and streamline techniques for calculating aggregate statistics, and (iv) providing scholarships to increase human capital aimed at strengthening statistical capacity in member countries.

Responding to these recommendations, the Bank launched a capacity-building initiative, known as IDB-STATCAP, in September 2007. This is expected to help the member countries build and strengthen their statistical capacities. The initiative, in turn, would enable them to produce reliable, timely, consistent and accurate economic, financial, socio-demographic and other data (in accordance with international good practice and frameworks) for policy formulation and decision-making. Those data are also vital for monitoring development and poverty reduction, which is the cornerstone of IDB's strategic objective.

The IDB-STATCAP provides scholarships for statisticians working in national agencies to obtain masters degree in statistics and other related fields. It also provides technical assistance facility to support member countries and regional statistical institutions to attend and organize training, workshops, conferences, and exchange of staff from one national statistical office to another. The facility also offers financial support for improvements in the following four components: (i) physical infrastructure and equipment, (ii) statistical infrastructure, (iii) statistical operations, and (iv) institutional framework for national statistics. The guidelines and procedures for applying for technical assistance under IDB-STATCAP are avail-

able on the IDB website at www.isdb.org.

The IDB-STATCAP is unique for a number of reasons: First, the initiative is the first of its kind in the domain of statistics ever since the IDB was established. Second, it draws resources from existing Fund/Programmes of IDB Group (comprising five entities; IDB as the flagship, IRTI, ICD, ICIEC, and ITFC. Details on these entities are available on IDB's website). Third, it is comprehensive as it involves the use of combined tools/facilities of IDB Group to support and strengthen statistical capacity of member countries (such as provision of scholarship, training, workshops and technical assistance). Fourth, it provides resources for member countries to break out of the vicious cycle of underperformance and underfunding of national statistical agencies. Fifth, it fosters close cooperation between data producers and users through establishment of statistical working group, which meets regularly.

Building a synergy between IDB-STATCAP and ICP

The IDB has a considerable stake in the International Comparison Program as it provides a critical information base for the core areas of its work program in socio-economic development. Forty-seven of the 56 IDB members are participating actively in the ICP. The scope of its benefits is wider than the specific objective for which the ICP was initially created, namely international comparison. Apart from providing vital development data, the program serves as a capacity-building platform by harmonizing statistical concepts according to international norms and standards.

The IDB-STATCAP and the ICP are complementary as they draw on each others capacity-building strategy. The IDB supports the ICP activities by building and strengthening the capacity of member countries that are participating

in the ICP. This enables the program to focus on the bigger picture of collection, harmonization, standardization and dissemination of data, thereby ensuring timely release of ICP results. The ICP Tool Pack helps member countries to build infrastructure, and the regional ICP workshops and training programs are good examples of how it reinforces the IDB-STATCAP activities.

In addition to providing financial and technical support to IDB-STATCAP initiative, the Board of Executive Directors, in 2007, made financial contribution to the ICP global trust fund to meet the financial gap of the 2005 round, as well as to support the next round. An agreement on the IDB-World Bank collaboration was signed on 9th September 2007. As part of the collaborative effort, a representative of IDB was appointed to join the executive board of the ICP. Under the agreement, the IDB's contribution would cover member countries in Asia, Western Asia, Africa, and the Commonwealth of Independent States. Some of the activities to be financed include data collection, regional meetings and workshops, technical assistance to member countries, and an independent evaluation of the program in member countries in order to provide feedback and recommendations essential to the preparation of a plan of action for the next round of ICP.

The IDB fund will help finance a "lighter" version of the ICP Tool Pack with the objective of developing CPI facilities. That version is expected to reduce both the training needs and the hardware requirement of those countries with weak statistical infrastructure. It has two objectives: compiling robust CPI, and building capacity in data collection, verification, processing, reporting and dissemination.

The IDB looks forward to participating in the next round and wishes to congratulate the ICP and its team for all the successes they have achieved so far. ■



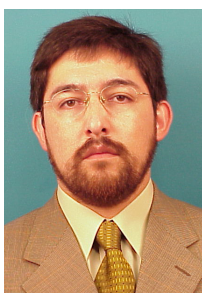
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International Comparison Program: the South American experience

Ten South American countries (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay and Venezuela) participated in the 2005 round of the International Comparison Program (ICP), which was regionally coordinated by Statistics Canada (STC) and the Economic Commission for Latin American and the Caribbean (ECLAC).

South America was the first region to release the results for the Final Household Consumption (June 2006) and for the Gross Domestic Product (GDP) and its main aggregates (June 2007). The success of the South American region is in part due to the fact that it had some comparative advantages in terms of the relatively small number of countries in the region sharing common languages and to the application of several innovative methods. In addition, the dedicated work of the price and national accounts specialists contributed greatly to the positive outcome.

This article presents several innovative aspects of the experience of some Mercosur countries (Argentina, Brazil and Uruguay) and Chile.

The first section describes the great effort invested in harmonizing consumer price indexes in the region before implementing the ICP. This was the first time the comparability and representativity principles were applied in the region. These two principles would later be used in the ICP. The second section introduces the tasks related to field visits and the instructions for surveyors. The third section focuses on the importance of a disciplined coordination with a tight schedule. Finally, the fourth section describes the work done by the national accounts specialists regarding the harmonization and reconciliation of the variables used in the ICP.

1. Harmonizing Consumer Price Indexes

The 2005 round of the international comparison program (ICP) in Latin America benefited from the project that aimed at defining and calculating the Harmonized Consumer Price Index. The latter was developed by the national statistical offices from Argentina, Bolivia (at the initial stage), Brazil, Chile and Uruguay and the Central Bank of Paraguay. Shortly before starting the ICP, the Andean Community had also started a similar, parallel project.

The harmonization process relied on the participation of ECLAC and the technical advice of experts from within the region, from Canada and from Europe. The studies and the calculated harmonized indexes were carried out between December 1998 and July 2005, when the 1999-2004 harmonized Consumer Price Index series and the general project guidelines were published.

The adopted process for the construction of harmonized CPI strengthened the integration of the teams from the participating institutions, which was reinforced by the perception that a project conducted by international partners is viable if there is a firm coordination and commitment to fulfill the responsibilities agreed upon. The ICP adopted in Latin America a similar approach, firmly improving the technical coordination. In addition, the harmonized CPI project the skills of the participating personnel, the exchange of experiences on the official consumer price index methodologies from the different countries and widened the knowledge related to the international recommendations in the production of price statistics. The experience with the ICP, apart from benefiting from these aspects, also favored further progress in the teams' training.

The two dimensions of the concept of harmonization – comparability and repre-

continued

sentativity – were widely adopted and balanced within the harmonized CPIs. This experience clearly demonstrated the importance of comparability, especially in terms of the collection of prices of goods and services in the Consumption Basket defined within the ICP's framework. The harmonized CPIs were defined in order to allow comparability in terms of the formulas applied as well as for other specific methodological concerns, such as seasonal variation.

For the harmonized CPIs, the same classification system of goods and services was applied, thus allowing comparisons of inflation at a reasonable group level. This is perhaps the most important contribution of the harmonized CPI project to the ICP. The classification used was the result of a detailed analysis of the classifications adopted by the national statistical agencies in the calculation of the CPIs in each country, which, until now, were not remotely comparable; even at the level of the more aggregate consumer categories they could not be easily compared.

The project was carried out following the Classification of Individual Consumption by Purpose (COICOP), 1998 version, prepared by the United Nations. After meticulous work, a common classifier was adopted. It became a basic instrument for the development of the 2005 ICP round in the ten South American countries.

Furthermore, the harmonized CPI project consolidated the professional skills of the specialists involved, who benefited from the exchange of experiences on the calculation methods used for the Consumer Price Indices in the various participating countries. The project also provided wider knowledge of recommendations and good international practices for the production of price statistics. Apart from providing the expected quantitative results, the ICP experience enhanced the training of national technical teams.

2. Horizontal and multilateral cooperation

The active participation of the team of regional experts and national coordinators was fundamental throughout the various phases of the project as it helped to achieve the objectives of the program and strengthened the quality of the price indexes in the participating countries.

As mentioned above, the two sub-regions (Mercosur and Chile, and the Andean Community) had to start with a vast shared working experience as a result of the harmonization of consumer price indexes that had begun at the end of 1998. This enabled the comparison of the baskets of goods and services provided by official CPIs from Mercosur and Chile, and from the Andean Community. On the basis of these comparisons, the ICP regional and national coordinators agreed, by consensus, on a common basket with a preliminary list of specifications and special national features.

The information to be collected and the type of outlets to be selected were determined by national coordinators with the help of the regional experts who visited each of the countries.

During these visits, the characteristics of each CPI were studied; the methods for price collection and the selection of outlets providing information were emphasized to the teams, especially field teams. The surveyors and supervisors were given an initial list of specifications, which had to be verified. Proposals for modifications were introduced, depending on the country, and photos were taken for verification and comparison purposes.

Horizontal cooperation was important; in some countries, the CPI specifications were adapted and teams were trained to meet the ICP price collection objective and to follow the specifications closely. The first contacts with the outlets were made and a list was given with suggestions of other stores to survey.

Assistance was provided for all the steps of the process from the organization of tasks to the field work. When difficulties were found they were evaluated at the following meeting. After every price collection, there was a follow-up activity to examine the collection process and evaluate the data for its consistency.

In other countries, the national team received assistance in identifying the products according to the specifications and the adequate outlets to carry out the price collection. In addition, a photo album was prepared to help identify the goods and services to be priced.

The first price collection (October, 2004) was used as a pilot test. During the test, difficulties were identified and solutions were proposed for each country. The regional meetings held at the end of each quarter, contributed in improving not only in relation to field work, but also in terms of the analysis of the information collected. It was a mechanism to check for consistencies, implement different kinds of quality controls, consider feedback information and improve results as the project moved forward.

It is important to mention that institutional commitment was essential to ensuring the project's feasibility in some countries, especially those lacking external resources. Originally, the plan was to make use of the national CPI processes and databases, but that turned out to be impossible and new human and logistic resources were required. Likewise, local specialists had to devote more time than initially expected. This can be improved in the next rounds, with more accurate planning.

The attendance of coordinators from other regions - such as Asia and Africa – to one of the meetings enabled discussion and the exchange of opinions and experiences, thus providing a good example of knowledge transfer and mutual enrichment.

3. Regional coordination and technical assistance

Coordinating ten Latin American countries in the ICP was not an easy task. The project lasted three years. During this period, a common basket was defined, and price surveys were conducted for the goods and services included in that basket, the estimation and aggregation of the purchasing power parities (PPP) was completed and the results were published.

With this kind of challenge, the only way to achieve results with different national teams is through major commitment from the countries. Thus, regional coordinators convene the heads of national accounts and consumer price indexes in each of the countries and entrusts them with the responsibility and the implementation of the project.

However, the commitment of the countries could not have been sustainable without the strong support of the regional coordination, which helped solve problems as they arose. The regional coordination for South America was done by two highly prestigious international institutions: ECLAC and STC.

The early work carried out by ECLAC involved defining the goods and services to be included in the region's common basket. The countries were given forms to complete with specifications, mainly related to food and beverages. Once these forms were completed, the agency made a global comparison and decided on the specifications most common to all countries.

It is also important to highlight the work done by STC. The participating countries signed an agreement with STC to protect the statistical information. In accordance with the agreement, the STC team was in charge of revising and controlling the prices and specifications sent by the ten participating countries for the four price collection of consumer goods

and services. This was an enormous volume of information.

The dedication, efficiency and professionalism with which the aforementioned tasks were performed made a significant contribution to the project. Countries had to comply with a tight work schedule, but they were encouraged by the good example set by the STC team, in terms of the quality of work and its strict compliance to the timetable.

During the program, countries had permanent support from the regional coordinators - even on bank holidays and at unusual hours. This created a bond of trust that made it possible to meet the established goals.

The technical team of Uruguay also received IT support, since they adopted the Toolpack system to process the consumer price surveys. Working in close collaboration with the World Bank's Toolpack team, Uruguay was the first country to apply this software to an actual survey, thus testing out the system.

Toolpack was adopted once the ICP had started, and the problems that arose demanded rapid solutions. The World Bank's Toolpack team interacted quickly and efficiently with the Uruguayan technicians, overcoming obstacles and allowing them to submit the IPC surveys data to the regional coordinators in a proper and timely fashion.

In the remaining countries, the CPI systems were adjusted or specific processes were developed by IT specialists in order to use those systems for the ICP.

4. Weighing the importance of national accounts

The national accountants' contribution to the ICP in South American countries involved estimating the components of GDP expenditure, considering the relevance of these variables in the calculation of the Purchasing Power Parities.

The first, the more laborious and

longer phase of the study, consisted of calculating and analyzing the Household Consumption for each country. For this purpose, consumption by expenditure categories and by products or basic headings (following the ICP classifier) was estimated, including greater detail than normally provided for national accounts. In order to have a comparable weight structure, some concepts and product classifications were standardized.

The second phase focused on the other expenditure components of the GDP. Greater detail than usual was provided for the estimates of general government expenditure and gross fixed capital formation (GFCF). In the case of the former, the national accountants faced with the complex task of comparing variables - such as salaries by category and individual consumption expenditure - between countries with a different degree of government participation in the economy.

In the case of the gross fixed capital formation, it was necessary to define the type of construction goods, machinery and equipment, which are very heterogeneous within a single country and between countries. Additionally, the capital goods prices were standardized and the V.A.T. was taken into account.

There was no special treatment of the other GDP components, as they are calculated according to the regular national accounts estimation process used in each country.

It is important to mention that determining and reconciling the different variables was not an easy task, but thanks to the support provided by the STC, the World Bank and the ECLAC technical teams, problems and difficulties were solved. One of the most complex issues to deal with was household rents. In this area, estimates must be improved in most countries, especially in terms of imputed rents. In addition, some other aspects should be harmonized and improved, such as: gross

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ICP: The Philippine Experience

The Philippines has been involved in the current round of ICP since its inception in July 2003. Its involvement started with the selection of items to be included in the list, the firming up of the structured product description of the items, the conduct of series of price surveys, the validation of survey results vis-à-vis those of the other participating countries and up to the review of the computed PPPs. The Administrator of its National Statistics Office is currently the chair of the Regional Advisory Board for the 2005 round of the ICP Asia-Pacific.

ICP as a Platform for National Capacity Building: Gains and Learnings

An important by-product of the ICP is the support, and in some instances, the initiation of national and international efforts to improve the quality of price statistics and national accounts data, upon which the calculation of PPPs depends.

New tools for data collection like the “what to price guide” together with the colored product catalogue for more accurate product identification helps improve the quality of collected price data. Improved spatial coverage of price surveys, that is, covering outlets located in rural areas provides for better representation of prices collected. The United Nation’s Classification of Individual Consumption According to Purpose (COICOP) in the grouping of items in the ICP has been adopted for international comparability. These gains will be beneficial in the current preparatory activities

for the rebasing of the Consumer Price Index (CPI) in the country.

The Structured Product Description (SPD) was instrumental in highlighting the need for tight specifications for accurate product identification as it assures the comparability of products being priced especially for non-food items in the CPI. In the current preparatory activity for the rebasing of the CPI in the Philippines, the design of the questionnaire for the Commodity and Outlet Survey (COS) is being guided by the SPD in the ICP. The results of the survey will be used to determine the items being purchased by the households.

The software Tool Pack for processing ICP/CPI can contribute to more efficient processing of price data used in constructing the CPI. The Price Administration Module, a utility of Tool Pack, has a special feature of producing a diagnostic report for each product listed. Moreover, the display of the minimum and maximum price for each commodity during each survey round has been beneficial in survey operations for the ICP. This special feature also includes a summary report that is very useful during the price verification stage of the survey as it provides information on the location of a specific outlet and the price collector assigned in a particular area. Thus, the validation of price data and monitoring of the survey operations will result to improved accuracy of the CPI.

An indirect gain in the participation in the project is the improvement in the compilation and validation of national accounts. In fact,

An important by-product of the ICP is the support, and in some instances, the initiation of national and international efforts to improve the quality of price statistics and national accounts data, upon which the calculation of PPPs depends.

the government office generating the accounts is also considering the rebasing of its series to be at pace with the other countries participating in the current round of the ICP.

The engagement of the services of country experts in construction and equipment and the actual visits by the national coordinators to construction sites has greatly benefited the statistical officers who were not well versed in pricing items under this category. The formation of separate Core Group Experts for the construction and equipment sectors was another pioneering step for data validation. The sharing of experiences in collecting price data for the sector enhanced the comparability of data across countries.

Harmonization of Prices

Harmonization of the regular CPI survey with that of the previous ICP survey is being considered in order to preserve the acquired technical capability of the NSO Philippines' staff in carrying out the required statistical activities for the new PPP.

The Office is now in its planning stage for rebasing the current 2000-based CPI, and the incorporation of the methods learned during the ICP work is underway. First in the list is the study of re-grouping the items in the CPI following the United Nation's COICOP. After the re-grouping, a new set of questionnaires will be used in the COS to be conducted in 2008 that in turn shall be the basis for updating the provincial market baskets of the CPI.

The decision to build a comprehensive list of items for the rebased CPI and at the same time that of the ICP was arrived at after taking into consideration the needs of the future ICP survey rounds. During the COS, households will be asked on the specific details of the items they consumed/availed of as listed in the questionnaire. These specifications have to be so structured as to capture the price

determining factors of a product or service just like in the ICP product list. Once the lists (for CPI and ICP) from the COS have been constructed, it is planned that the price survey of items in the ICP list shall be conducted every semester/year as required to make it a continuing program in preparation for future ICP work.

The COS will also take into account products and services consumed/availed of by poor households in preparation for the PPP for the Poor. A possible disaggregation into urban and rural households consumption is likewise being considered as a determining factor in coming up with the decision whether or not to expand the coverage of outlets in the rural areas for the CPI just like in the ICP.

Inasmuch as CPI weights are based on the results of the Family Income and Expenditure Survey (FIES), plans for the FIES questionnaire to follow the COICOP groupings are also being considered for the next round of survey slated in 2009. This will help facilitate the computation of weights for the PPP for the Poor, that utilizes CPI weights in the process. All these activities are geared towards the harmonization/linking of the CPI with the ICP.

National Accounts Statistics

On the GDP weights estimation, the National Statistical Coordination Board (NSCB), the government office in charge of the national accounts of the country, undertook additional estimation activities to be able to satisfy the disaggregation of the GDP expenditures into the 155 Basic Headings.

There were problems encountered in the computation of details required by the ICP as only the

GDP expenditures for the major items were available. However, in order to obtain the details of the GDP expenditures on the Personal Consumption Expenditure (PCE) side, the structure generated from the 2000 FIES was used.

The improvement of the GDP data is the immediate and long-term concern of the NSCB. The agency is now preparing the over-all revision of the national accounts together with the shifting of the 1985 base year to 2000. Also to be included in the revision are improvements in estimation methodology, use of updated census and survey results and use of alternative data sources.

The 2005 ICP has accomplished several milestones. The simultaneous participation of China and India, a first for the ICP, significantly increased the coverage and relevance of this round. The strong partnerships established at the national, regional, and global levels were pivotal in addressing the challenge of significant diversity in size, geography, and statistical capacities. The improvements in methodology, product specification, data collection, data review, and data processing led to PPP estimates that are far more credible than earlier rounds. For the first time, we have a robust comparative snapshot of the Asia Pacific for 2005. Most importantly, the 2005 ICP Asia Pacific has over the years established the technical know how and institutional capacities in the national statistical organizations to serve as the effective platform for future ICP rounds. Overall, the 2005 ICP Asia Pacific has been a partnership for progress.

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Erica ... continued from page 27

Way Forward

The NSO Philippines plans to integrate ICP work in its regular CPI activities and in the rebasing of the CPI beginning 2008 with the conduct of the COS. It also plans to adapt and integrate the Tool Pack software in its current processing system for the monthly CPI once IT facilities in the provincial offices have been upgraded to meet the requirements of the software. Integrating Tool Pack in processing price survey results for the CPI and other price indexes is seen to help improve the monitoring system of price surveys and to further enhance the accuracy of price data.

The ICP project has provided insights on how other countries in the region do their price surveys and their pricing practices. The possibility of replicating PPP computation across regions of the country is among the important benefits the Philippines has gained from participating in the project. The same can be done with the PPP for the poor.

Recommendations

NSO Philippines recommends that once the PPP figures are finalized, details of the actual method used in its generation and in the interpretation of results be discussed by the ICP regional offices with the participating countries. Said discussion should include the actual benefits that a participating country derives from the PPPs vis-à-vis those of the multilateral institutions. It is also recommended that the ICP regional offices assist the participating countries in disseminating the PPP to their stakeholders. Finally, it is recommended that advanced notice be made on future plans to institutionalize ICP in the national statistical offices so that related activities can be included in their respective plans and budgets. ■

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fixed capital formation in commercial construction and own-account construction activities, given informal nature of the latter and differences in prices as well as characteristics of projects; the treatment of financial intermediation services indirectly measured (FISIM), government consumption of fixed capital, education and health expenditure, and household consumption in specific sectors.

5. Conclusion

In conclusion, the ICP was an enriching experience for the participating countries, as it encouraged the exchange of opinions on calculation methodologies for consumer price indexes and national accounts. It allowed professionals in price and accounts divisions to see one of the practical uses of the results they produce, such as the calculation of the PPPs. At the same time, it also showed the importance of harmonization methodology to allow comparability between countries. In this sense, more emphasis must be placed in the future on the implementation of international recommendations and best practices regarding the calculation of national accounts.

The region should not wait for a next round to move forward in many areas, especially those related to the methodology, accuracy and reliability of estimates, which have an impact on the quality of results, especially when dealing with the GDP and its composition, which are the weights used in PPP calculation.

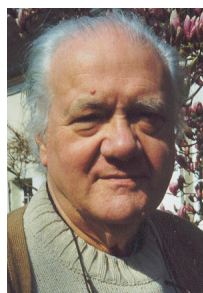
Finally, the knowledge and experience acquired in this ICP round for South America should be considered an asset in the planning of new study. The next ICP round might begin, for instance, with the GFCF and government consumption – areas which, although representing a small part of the GDP, are extremely difficult to measure. ■

In South America, the 2005 ICP round was achieved successfully on time and produced results of good quality. This outcome would not have been possible without the team work and dedication of the participants of the ten South American countries. Drawing on their experience of the Harmonized Consumer Price Index, the ten countries brought their capacity and experience in collaborating on a multi-national project. In addition, the exercise had the tremendous potential for spill over effects on the National Statistical System of the participating countries, especially on harmonizing concepts, definitions and practices in the collection of data.

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Purchasing Power Parity Measurement for Industry of Origin Analysis

1. Introduction

Purchasing Power Parities have a wide range of analytical and policy applications. Traditionally, PPPs are used for international comparisons of income, expenditure and output. Price level indices based on PPPs are also of direct use in various studies of price convergence of goods and services. They play a pivotal role in research on growth and convergence in the world economy, and in historical comparisons of relative income and productivity, both at aggregate and industry level. PPPs are also indispensable in empirical applications of international trade and endogenous growth theories. Most studies, however, are based more or less exclusively on a purchasing power parity concept that is rooted in the expenditure approach. They rely on expenditure PPPs, obtained directly from the regional exercises of the International Comparison Program co-ordinated by the World Bank, or from annual or tri-annual PPP exercises by Eurostat and OECD respectively. Academic users, in addition, make a lot of use of PPPs from the Penn World Tables, which are based on ICP.

By definition, a major part of the research in these areas requires PPPs by industry (agriculture, manufacturing and services), rather than by expenditure category. This is especially true for studies that focus on sectoral price and productivity issues. Balassa-Samuelson type studies also require measures of relative price levels of tradeable vis-à-vis non-tradeable sectors. Convergence studies are increasingly made at the industry level, and tests of endoge-

nous growth models require level measures relative to the world productivity frontier by industry. More generally, studies that focus on the dynamics of growth from a perspective of structural change, need to take account of industry-specific PPPs. Measurement of PPP by industry will also be very useful in providing a cross-check against the new set of expenditure PPPs for 2005 that have recently become available (World Bank, 2007). For example, it may shed some light on the controversy around the new PPP-based per capita expenditure measures for China and some other emerging economies, which have turned out considerably lower than previous estimates published by the IMF and individual scholars (for example, Financial Times, 2007; Heston, 2007).

However, there is a widely-held view that industry-level “production PPPs” (as we will call them in the remainder of this article) are scarce and empirically difficult to obtain. Until recently, available datasets included only a small number of countries, and were often based on bilateral (pair wise) instead of multilateral comparisons. This precluded cross-country regression work and hampered generalizations. More fundamentally, it was pointed out that there are measurement and data difficulties with production PPPs, which mainly related to the lack of readily available producer price surveys.

As an alternative to using production PPPs, some studies resorted to the use of ‘adjusted’ expenditure prices as a proxy for prices for industry output in the PPP literature (e.g., Jorgenson, Nishimizu and

continued

Kuroda, 1987). Final expenditure prices, for example, need to be adjusted for trade and transportation margins, for taxes and subsidies, for prices of exports and imports, and for prices of intermediate use, in order to provide a good proxy for domestic output prices. Unfortunately, the exact nature of these adjustments has not been clearly spelled out in the literature so far.

This article first briefly reviews some of the earlier work that has been done on industry-level studies of PPPs by the International Comparisons of Output and Productivity (ICOP) project at the University of Groningen in the Netherlands. It then discusses some recent and ongoing work on the combined use of expenditure and production PPPs for industry level studies. The article ends with a few remarks on how the synergy between the two can be developed, strengthened and sustained, and how the program should evolve to meet the growing public and private demand for PPPs by industry.

2. A History of International Output and Productivity Comparisons

The first work on international income comparisons started in the 17th century. Gregory King used a mix of clues on the three main facets of national accounts - income, expenditure and production - to make rough comparisons of 1688 income levels in France, the Netherlands and the UK (see Maddison, 2007 pp. 280-282). His approach was further developed by individual scholars over a period of 250 years, with substantial clarification of what the scope of the accounts should be, a large accumulation of estimates for individual countries. In the 20th century, several important steps were taken forward in the provision of international purchasing power converters, for example, the Board of Trade enquiries into working class cost of living in Belgium,

France, Germany, the UK, and USA in 1908-13 (cited in Williamson, 1995). This was followed by Colin Clark's bold (1940) attempt to compare real expenditure levels and productivity by major sector of the economy in 26 countries.

The big step forward in comparing levels of real product and purchasing power came from Organization for European Economic Cooperation (OEEC) in the 1950s with two studies—one by Gilbert and Kravis (1954) on expenditure comparisons and one by Paige and Bombach (1959) on real product comparisons. The expenditure approach, as developed by Kravis, Heston and Summers in the International Comparisons Program since the 1960s, then became the leading approach used by international organizations and resulted in the Penn World Tables (Kravis, Heston and Summers, 1982; (Summers and Heston, 1991; Heston et al., 2002).

The production approach developed by the ICOP project of the University of Groningen since 1983 is derived from the bilateral UK/US comparisons of Rostas (1948), Paige and Bombach (1959) and the 27-country comparisons in Maddison (1970). Maddison (1983) provided an alternative to the Kravis, Heston and Summers expenditure-based ICP results with industry of origin study. Over the past two decades more than 60 ICOP studies have appeared, which together add up to comparisons for more than 100 countries in agriculture, over 30 countries in manufacturing and in a variety of services industries (see van Ark and Timmer, 2001; Maddison and van Ark, 2002, for a review). ICOP has always been intended to be complementary to ICP rather than a substitute. It involves a comparison of real output (value added) in major sectors (agriculture, industry and services) and of branches within these three broad sectors, as well as measures for GDP as a whole. It takes an integrated view of out-

put and input quantities, producer prices and the values derived from these prices and quantities. It includes labor productivity measures with labor input measured in working hours where possible. It has been used in conjunction with estimates of capital stock and capital services aimed at measuring total factor productivity.

The ICOP research technique is different from that of the ICP. Rather than special surveys, it uses information from production censuses, input-output tables, national accounts and, more recently, information for individual firms. Its integrated statistics of quantity, unit value, and values permit cross-checks not available to ICP. For example, it identifies variations in the coverage of national accounts, which ICP has not explored. The ICOP comparisons have essentially been bilateral, with the USA as the numeraire country and also as the star country. The first array of ICOP results was bilateral, using either the Paasche or the Fisher PPP variants. However, Pilat and Prasada Rao (1996) and Prasada Rao and Timmer (2003) applied multilateral techniques to our manufacturing comparisons.

The interests of the ICOP group have been worldwide, but it never aimed at comprehensive coverage. The coverage of OECD and EU member states is now fairly comprehensive, but on a worldwide basis efforts have deliberately concentrated on relatively large countries, which provide a picture covering three-quarters of world population and output and a very wide range of income levels.

3. A Recent Update on ICOP PPPs for Industry Output

In recent years, there has been an increasing appreciation of the case for combined use of production and expenditure PPPs to strengthen comparisons of output and productivity at sector and industry level (Pilat 1996, O'Mahony

1996). Following some pioneering studies for individual pairs of countries, Timmer, Ypma and van Ark (2007) represent the first attempt to construct a comprehensive dataset of PPPs for industry output based on a mix of adjusted expenditure and production PPPs for a wide range of OECD countries.

Using a supply-and-use framework, Timmer et al. (2007) set out to reconcile measures of expenditure and domestic output prices, and determine under which circumstances adjusted expenditure prices are a reasonable proxy for basic output prices, and which adjustments need to be made. First, final expenditure prices are only equal to the basic output prices for final goods, which are not internationally traded. Second, when a product is only used for intermediate consumption, the domestic output price cannot be obtained on the basis of a final expenditure price. Third, when a product is mainly exported, the adjusted final expenditure price will overestimate the basic output price. In all other cases, the adjusted final expenditure price provides a biased estimator of the basic output price, whose size depends on the differences in purchasers' prices and the ratio of import, export and intermediate consumption to total output. When developing PPPs, an important question is whether the biases are in the same direction and of similar size in both countries. When this holds, final expenditure price ratios might be a reasonable proxy of output price ratios. But if these assumptions do not hold, the adjusted final expenditure price provides a biased estimator of the basic output price ratios between the countries. This is most likely to be the case when comparing economies with very different trade/GDP ratios, such as a small open economy, like Belgium or Denmark, with a big economy like the U.S. or Germany.

Given available data this new ICOP dataset presently includes PPPs for gross output of 45 major industries, covering the total economy, and 25 countries for 1997. For the PPPs at 3-digit industry level, two sets of PPPs were compiled where possible, that is, production PPPs based on output unit values and producer prices, and a set of adjusted expenditure PPPs. For some industries, only one of the two alternatives is available. For example, production PPPs are not available for a number of service industries due to a lack of appropriate value data at industry level and the difficulty of defining quantities. In some manufacturing industries, the use of expenditure PPPs is not an option because no expenditure price data are available for intermediate product items.

At industry level, the production PPPs, as traditionally developed in the ICOP program, is the most preferable PPPs, at least theoretically. However, the main practical objection against using production PPPs is that these are mostly based on ratios of unit values. Basic prices for specified items at producer level are often not available. Unit values often suffer from 'product mix' and 'product quality' problems in international comparisons. Their availability may also be biased toward samples of products, which are relatively homogeneous, less sophisticated goods. Production PPPs are then not representative of the more upgraded, high-quality varieties in the same industry.

In recent years, these criticisms have been dealt with in various ways in the ICOP research program. For example, the availability of an EU-wide harmonized survey with quantity and value data at basic prices for manufacturing products (PRODCOM) is an important improvement in the international comparability for that sector over earlier studies. The number of unit values, which can be calculated is now much higher than in

earlier studies, due to more detailed product data on values and quantities. Finally, the use of secondary sources on prices either derived from business data or from industry specific surveys, have helped to reduce the biases in production PPPs. Nevertheless, in some cases expenditure PPPs are still the better choice. The decision on whether to use expenditure PPP (with imperfect adjustments) or a production PPP (which is often based on a unit value) is largely an empirical one, and will differ between industries. It may also change over time as new data become available and old data sources are discontinued.

Table 1 presents the relative price levels for all 25 countries relative to the U.S. at the broad level of 10 major sectors in 1997. It applies a multilateral (EKS) weighting system for all industries, building up from a detailed 3-digit industry level and using a single set of output weights in aggregation. The results suggest considerable price differences between sectors and countries. For agriculture, for example, relative price levels vary widely. This is due mainly to high price levels in the agricultural sectors in Japan, Norway and South Korea, which are characterized by high protection levels. Manufacturing price levels are much closer together, but there are still some important differences. While relative prices in manufacturing are quite high in Austria, Japan and Norway and much higher than in the U.S., they are particularly low in the Eastern European countries, at typically 60 percent to 70 percent of the U.S. level. This variance might come as a surprise. One of the cornerstones in international trade theory is the so-called Law of One Price: the price of an internationally-traded good should be the same anywhere in the world once that price is expressed in a common currency. However, there are many reasons for this hypothesis not to hold in the short run,

Table 1: Relative Price Levels for Gross Output based on Combined Use of Expenditure and Production PPP, US=1.00, 1997

Industry	Agriculture	Mining	Manufacturing	Utilities	Construction	Trade	Transport & communication	Financial & business services	Other services	Public services	Services sector average
ISIC	01-05	10-14	15-37	40-41	45	50-55	60-64	65-74	90-95	75-85	50-95
Poland	0.80	0.71	0.67	0.57	0.45	0.53	0.62	0.37	0.36	0.20	0.41
Slovakia	0.96	1.72	0.71	0.40	0.35	0.48	0.58	0.30	0.26	0.17	0.36
Hungary	0.84	0.67	0.68	1.04	0.56	0.63	0.57	0.36	0.29	0.18	0.41
Czech Republic	0.95	0.73	0.65	0.69	0.36	0.50	0.69	0.44	0.33	0.16	0.42
South Korea	2.28	1.49	1.02	0.98	0.77	1.05	1.00	0.85	0.73	0.42	0.81
Taiwan	1.94	2.26	0.80	0.94	0.57	1.08	1.14	1.08	0.65	1.15	1.02
Greece	1.79	1.66	1.07	1.03	0.73	1.18	1.26	0.77	0.77	0.47	0.89
Portugal	1.30	1.55	1.04	1.39	0.59	0.78	0.82	0.64	0.68	0.46	0.67
Spain	1.24	0.85	0.87	1.16	0.84	0.84	1.06	0.81	0.95	0.61	0.85
Ireland	1.32	1.52	1.19	1.53	1.06	0.96	1.43	0.97	0.89	0.77	1.00
Finland	1.69	1.40	1.14	1.18	0.73	1.01	1.25	1.34	1.21	0.89	1.14
Sweden	1.30	1.87	1.27	0.83	1.31	1.37	1.02	1.38	1.18	0.93	1.18
Italy	1.49	1.18	0.95	1.09	0.85	1.17	1.24	0.83	1.05	0.75	1.01
Germany	1.20	1.20	1.15	1.42	1.31	0.95	1.30	1.20	1.07	0.93	1.09
Canada	1.05	0.78	0.92	0.82	0.73	0.91	0.76	0.97	0.85	0.69	0.84
U.K.	1.41	1.44	1.20	1.34	1.10	1.21	1.04	1.03	1.12	0.74	1.03
France	1.34	1.53	1.22	1.27	1.40	1.06	1.20	1.38	1.14	0.84	1.12
Australia	1.04	0.85	1.12	0.98	0.87	1.20	0.96	1.07	1.03	0.69	0.99
Belgium	1.27	1.39	1.08	1.46	1.03	0.97	1.45	1.04	1.09	0.81	1.07
Austria	1.22	2.20	1.35	1.45	1.11	1.15	1.49	1.20	1.16	0.87	1.17
Netherlands	1.33	0.98	1.14	1.45	1.29	0.91	0.84	1.06	1.01	0.70	0.91
Japan	4.86	2.38	1.50	1.96	1.57	2.07	1.72	2.10	1.74	1.00	1.72
Denmark	1.30	1.87	1.28	1.66	1.32	1.05	1.40	1.18	1.13	0.96	1.14
U.S.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Norway	2.00	2.05	1.40	0.82	1.16	1.33	1.79	1.27	1.45	0.96	1.36
Luxembourg	1.31	1.32	1.18	1.31	1.24	0.95	0.98	0.86	1.07	1.05	0.98
average, all	1.47	1.41	1.06	1.15	0.94	1.01	1.10	0.98	0.93	0.71	0.95
average, low	1.34	1.29	0.83	0.91	0.58	0.79	0.86	0.62	0.56	0.42	0.65
average, high	1.54	1.47	1.18	1.27	1.12	1.13	1.23	1.17	1.13	0.86	1.10
coef of var, all	0.53	0.36	0.22	0.31	0.36	0.31	0.30	0.39	0.38	0.41	0.32

Source: Timmer, Ypma and van Ark (2007)

including volatile exchange rate behavior and the many barriers to arbitrage. These include tariff and non-tariff barriers, transport costs, product differentiation and price discrimination. In general, there is consensus that PPP should hold in the long run, but not necessarily in the

short run (Taylor and Taylor, 2004). Indeed, our finding suggests that PPP did not hold true for manufacturing goods in the OECD in 1997.

Another frequently addressed topic in international trade theory is the Balassa-Samuelson hypothesis, which states

that the dispersion of relative prices of non-traded products between countries is larger than traded products. This is especially true for countries that are further apart in terms of productivity. The industry PPPs in this study confirms this regularity. For less developed countries within

the OECD, PPPs for output of services sector (see the last column of Table 1) is typically well below one. The lower output prices in less advanced countries are notably true for the construction industry, for public services and for other services. For distributive trade and for transport and communication industries, relative prices are much higher. This provides further support for the Balassa-Samuelson hypothesis as it predicts that the price differences will be bigger in sectors with higher intensity of labor. Arguably, sectors such as construction, public and other services are more labor-intensive than other services industries.

4. Strengthening the relationship between the expenditure and production approach

The evolution of studies on international price comparisons shows we need to go back to where OEEC left off back in the 1950s. Following the joint studies of Gilbert and Kravis (1954) and Paige and Bombach (1959) on the expenditure and production approach respectively, the paths in these two approaches have diverted. While the expenditure approach has become the common standard for international comparisons by (international) economic policy organizations, the production approach has been adopted by academic scholars interested in a large range of related issues.

Indeed, the cost of concentrating on the expenditure side is that production comparisons can only be made imperfectly at the level of GDP, whereas most analytic interest is in sectoral productivity comparisons. They allow policy makers and businesses to benchmark the productivity performance of industries in their own country to that of industries in other countries. Comparisons of productivity levels may also help shed some light on the relationship between productivity and

competitiveness. It also strengthens the analysis of the locus of technical progress, in particular when supplemented by micro-oriented investigation of variance in performance between industries and between average and best practice firms. Finally, productivity level measurement may inform the debate on policy reforms that may be needed to enhance productivity performance.

Comparisons based on production PPPs can also provide important cross-checks of aggregate comparisons as it allows for a direct comparison between real GDP comparisons measured from the output-side with those measured from the expenditure-side. The two differ by definition by the terms of trade for an economy (Feenstra, Heston, Timmer and Deng, 2008). While users of ICP (as well as Penn World Tables) have in mind the output-side, when they use real GDP to construct and compare country productivities, they are in fact using an expenditure concept. So developing separate measures for the two concepts of real GDP is of crucial importance.

An important next step to integrate the development of production and expenditure PPPs is to make use of supply and use tables, which is complemented by ongoing work in the field of growth accounting, notably the EU KLEMS project. The KLEMS growth accounts organize the information on output and input in a supply-and-use framework. Using this framework, one can simultaneously obtain sectoral output (i.e., excluding intra-industry firm deliveries) PPPs and intermediate input PPPs (Inklaar and Timmer, 2007).

Finally, it should be recognized that although there is great potential for a combined effort to use expenditure and production PPPs in an integrated framework, this work is at potential risk. This is due mainly to the large budget cuts

by national statistical institutes (NSI's), which lead to a reduction in the provision of information on products needed to derive production PPPs. NSI's spend less resources on collection of product-level information on quantities produced. For example, the number of products for which quantity data is shown in the U.S. Census of manufacturing has dramatically declined from the year 1997 to 2002. The future of the European PRODCOM database, which is the main building-block for production PPPs for manufacturing industries, is also uncertain. The usefulness of these statistics for international comparisons should be further stressed in international statistical fora. ■

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Can Spatial PPPs be used to Measure Global Inflation

1. Introduction

Now that the ICP has been in place for 40 years, it is time to reflect on how long-term economic concerns like global inflation can be measured, and to explore whether movements in relative prices observed since 1970 can shed any new light on structural change. Prior to the derivation of wide-ranging global estimates of purchasing power parities spanning several decades, these concerns were not open to economic interpretation and assessment in real terms.

What can benchmark price level information say about such key global issues as inflation and longer-term structural changes brought about by movements over time in relative prices and local purchasing power? If economic theory and concepts are to be substantiated or disproved, then they must be able to stand up to the test of empirical scrutiny both by their universality and long-term relational stability, and a demonstrable consistency across countries. Any reported price is an observation in space and time and, by construction, the International Comparisons Program (ICP) has the potential to illuminate the conditions explaining its characteristics.

The calculation, at roughly quinquennial intervals, of PPPs under the ICP has now been going on for over 40 years. At a broad level, the results can reasonably form the basis for testing the consistency of price relatives, economic structures and development levels across countries. Eminent economic analysts such as Nikolai Kondratieff, A.W. H.

Phillips, Wassily Leontief and Angus Maddison have all played a key role in drawing people's attention to the significance of long-term trends and relationships in economics. Only Maddison, however, has conducted any strategic economic analysis in real, price neutral terms.

With each successive phase of the ICP round, the number of countries covered has expanded and now well over 140 countries report at the comprehensive GDP and major sub-aggregates level. The latest aggregate PPP results were published toward the end of December 2007. The global data are a consolidation of centrally coordinated but separately managed and conducted regional price and expenditure enquiries. The 'regional' reports now being disseminated reveal a common general pattern of operational activities but with small divergences deemed strategically necessary to accommodate specific regional concerns or to overcome local problems. The global results, just published, provide a unique data set and the opportunity to analyze, on a real economic basis, global inflation and structural changes in GDP expenditure patterns over the long term.

In standardizing price levels, national growth rates can be recalculated in international rather than own price terms so as to generate real estimates of global growth. The corresponding movements in national prices can be aggregated using different weighting methods to provide a more appropriate estimate of global inflation. The process also

In its simplest form, global inflation is a temporal indicator that measures the aggregate rate of increase of these national prices averaged across all countries.

continued

enables researchers to determine more clearly what a measure of global inflation should represent conceptually. The following discussion looks specifically at the question of what is 'global inflation' and how it should best be construed as a measure to inform policy decisions.

2. What is Global Inflation?

By definition, global inflation is both a spatial and a temporal phenomenon. Its measurement requires amalgamating data across countries with time series measures of national price change. It could be suggested that 'global' inflation is, in practice, a meaningless concept and has little relevance to policy. Undoubtedly, it changes in relative prices between countries and sectors that have most relevance in a competitive market context. But, it is argued below that in drawing attention to the shifting foreign exchange value of the US dollar over successive ICP phases, this takes only a limited view of international inflation and its causes, and hence underplays the policy significance of this phenomenon. A global index is also a useful benchmark against which to monitor regional and assess national policy performance in controlling price changes.

In principle, the sequence of reference ICP benchmarks should reveal useful information about the pattern and process of overall and relative price change. The ICP, in each phase, has generated cross-sectional data that, at first sight, would seem to provide quite different perspectives on the historical process of economic development. A critical statistical issue in this connection is the process of linking regions together. The decision to adopt the 'ring' country approach to link socially and economically diverse regions is based on the assumption that PPPs at the basic heading level can be linked. Certainly, the ring

seems an improvement over the previous method of using a common solitary 'bridge' country, where the spending behavior and pattern of price relatives in the chosen bridge country ideally needs to be reasonably representative of both regions.

Attempts by both official agencies and independent researchers to link the results of the various ICP phases, however, have run up against both practical and conceptual hurdles. The desired inherent consistency of derived PPP or PPP-adjusted series has been thwarted by the practical need to resort to measures of own currency-based price movements and locally-calculated growth rates between ICP benchmark periods.

Interpolation techniques are applied to link successive ICP benchmark years by means of known price movements and series giving the estimated real expenditure values between them. Specifically, the benchmark PPP results are influenced not only by which countries take part but also by how many countries actually participate in each ICP round. It is only by examining how price structures in each phase have changed over time at the most detailed level, against a common benchmark of internationally priced GDP expenditures, that any broad assessment of shifts between, say, consumption and investment can be made. This need not prevent researchers from carrying out an overview and it does not rule out the possibility of a useful broad analysis of long-term economic change.

3. The Rationale for Measuring Global Inflation

Since early 21st century, rapidly expanding globalization and the closer integration of both international markets and financial institutions have fuelled a

growing concern about the need to control the contagion effects of speculative price movements and inflation infiltrating the world's economies. Today, global conditions are far less benign and can no longer be taken as 'given' and peripheral. They exert an exogenous effect on fundamental asset and liability positions and impact on the basic economic balances that influence a range of prices and relative price structures.

The desirability of studying global inflation has been emphasized by the recent neglect of long-term strategic economic analysis in favor of corrective short-term stabilization actions. It is important to recognize that global economic power and market conditions have changed considerably since the very earliest ICP research first got under way 40 years ago. The situation has altered even more dramatically over the past 10 years following the demise of the former Soviet Union and the rapid emergence of new economic superpowers such as China, India, Russia and all the oil-producing countries.

Accompanying this change has been an exponential rise in financial intermediation at all levels of private and public business. This has strengthened the position of monetary policy against more conventional macro-economic analysis. The flexible use of interest rates and credit controls is the manifestation of a greater institutional concern for short-term stabilization than with long-term structural change and economic renovation. Financial instruments have thus assumed a greater importance in policy formulation than the national accounts, traditionally used for informing forward-thinking macro-economic policy.

Over the past 50 years, all countries have seen the domestic purchasing power of their respective national currencies depreciate and, in some cases,

quite precipitously. National inflation, as measured by a country's GDP deflator, constitutes the main component of an overall measure of global inflation. But such a deflator not only tends to underestimate the full impact of local price rises on the ordinary household but it may also distort the true picture of international comparable inflation.

Households have also faced similar increase in consumer prices. On average, they have risen at around the same rate as the implicit overall production-based inflation. For a number of reasons, in the richer OECD countries with large public sector accounts, the Consumer Price Index has been rising slightly faster than the corresponding national deflator. This has occurred even though the households adjust their expenditures, and hence cost of living, to counteract inflation. Over the past year, the pace of price rise has picked up again, particularly for consumers in many 'mixed' economies. This mostly reflects the above inflation increments in public utility prices and transport services, compounded by escalating international energy costs.

The universal phenomenon of inflation is associated not only with economic progress (although technical advances should normally help to keep many prices in check) but also with indebtedness and exchange rate volatility. These latter factors impart a persistent and systematic upward twist to the spiral of inflation. Yet, compared with the world as a whole, the consequent erosion in national consumer sovereignty does not show up well in successive phases of the ICP. This underlines the significant role financial rather than actual market transactions now play in structural determinism and exchange rate patterns.

In the past few years, inflation-targeting has constituted a major tool of

fiscal and monetary policy in the richer industrial countries to keep prices under control. While relatively successful for almost a decade, this strategy has begun to fail. For a long time, its apparent success was mostly paralleled by the rapid integration of China's local production into the world economy. Despite the enormous lift the massive scale of cheap imports from China has given to price stabilization policies, there have been other underlying forces - associated with escalating oil prices and a depreciating US dollar - that have more than compensated for the low prices of Asian imports. Domestic wage drift in richer countries has also helped drive a further deep wedge into output costs, particularly in those service industries and public sector operations that are slow to implement productivity changes. It has become increasingly evident that most national governments, other than perhaps those managing the largest economies, have a very limited ability to manage and control the inflation rate.

4. The Measurement of Global Inflation

The concept of global inflation can thus be viewed from two quite distinct perspectives. The first and most obvious is to measure this phenomenon as the mirror to global growth. The resulting index would provide an overall estimate of price change that takes stock of national inflation in all countries as measured from a common reference benchmark. These prices can be weighted by relevant economic characteristics such as expenditure sub-component measures of GDP, household consumption, population, or according to distinct product and expenditure groups. Whatever index is derived, it would not distinguish between the international and domestic market influences. Such an index would

satisfy the general index principle that $P \times Q = V$, where P and Q represent price and quantity respectively and V stands for volume of output.

But such an aggregate price measure is affected by the influence that each country's own currency and prices impart to a comparison of national price change. To be truly comparable with other countries and to represent international price movements, local prices should be reweighted by domestic expenditures that have been revalued to a common international price basis.

The second concept of global inflation is more specific and, in many respects, of greater policy concern. It requires the identification, for all countries in the world, of the core but usually intangible element of national price rise that can be attributed to the undefined 'global' factors. These are usually embedded either directly or indirectly in international trade and external financial flows.

Identifying exactly what international price mechanisms overpower or intrude on domestic market conditions is difficult to determine and isolate. At one stage, it was thought comparisons of ICP results over time might hold the clue. And such a position was adopted by the World Bank in initially revaluing upwards, the criterion of 'one dollar a day per head in PPP terms' to measure global poverty. It has since become evident that such a measure is confounded by a number of factors, many uncontrollable, and is not robust. Evidence provided by the recent decline in the nominal value of the US dollar has undermined the effectiveness of choosing any particular currency to serve as a stable PPP standard and common reference base.

'World Development Indicators 2007', published by The World Bank,

shows annual GDP price changes, on average over the period 2000-2005, ranging from small negative trends (not surprisingly) for Hong Kong and Japan, plus very low rates for Singapore and around 2.5 percent for most OECD countries, to over 80 percent in the case of Angola (but ignoring the special case of Zimbabwe). Price changes in most cases over this period, however, hover between 5 percent and 6 percent annually, with annual national price increases very much higher in the former Soviet Union, where all countries were undergoing dramatic structural change, and in most of Africa. Trade performance and investment activity explain a lot of the price and structural change that has been experienced in the world's economies since 1990 but here, too, much of this has been driven by technical progress, with significant wage increases in the West being partially offset by rising labor productivity

The measurement of what may be loosely termed 'overall' global inflation is the mirror image of global growth. But quite rudimentary approaches have been adopted to assess this rate of 'international' inflation. These have been variously described by unweighted indices of overall national price change or of specific consumption and investment product prices. These indices apply, in effect, country weights to different national price change. This hardly reveals the real importance of global price movements. In 1996, the IMF, in reviewing economic progress in its 145 member countries, published (for the first time) an important table showing that between 1960 and 1990, the national inflation rate had averaged 10 percent annually for these countries. The measures appeared to be unweighted but, more interestingly, the table showed that the highest average price rises over

this period occurred in countries with floating exchange rates, while the lowest price increases occurred in countries that maintained fixed or pegged official exchange rates. It is important, therefore, to try to identify the main sources of inflation and separate the causes of such international price changes so as to assess their relative importance accordingly. (It may well be that the IMF study did not distinguish between official rates, or assumed principal rates of exchange, and what were the actual transaction rates).

The equally desirable objective to determine, where possible, the autonomous component of global inflation that is implicitly embedded in many domestic prices is more elusive. Such an index would clearly help analysts to identify where the burden and incidence of external forces on domestic prices are most likely to be felt. In principle, the global inflation element in national price movement is represented by the core upward trend in prices common across all countries.

It is conceivable the origins of this 'core' inflation can be found in the increasingly uncontrolled and intangible global financial arrangements. There is an observable asymmetry between the total assets owned (nominally) and overall liabilities owed by many major economies and agencies that can potentially create financial imbalance, especially if there is no readily realizable collateral. So, can the expenditure profligacy of the rich countries, their excessive consumerism and the corresponding spending beyond available means, be blamed for global inflation? The national indebtedness that inevitably results must be a primary cause of the increased money supply and absence of new goods and services to compensate. If this is so, do the primary consequences fall indirectly,

but most heavily, on the poor and poorer nations in particular? These questions are still very much the stuff of 'work in progress' and research on them needs to be stepped up.

All the above factors tend to ratchet up prices across all countries. Global inflation is 'international' specifically, insofar as it reflects the changing relative purchasing power of populations both as their per capita incomes rise and their basic needs expand. People's 'wants' grow more complex in response to wider choice, higher disposable income and the greater ease of borrowing, facilitated by official policy. They are also driven, in part, by the influences of advertising and expanded market access. They combine to stimulate, through the shifts in the conditions of demand that are thereby encouraged, consequential increases in average price levels for consumer goods and services.

Global inflation also reflects the changing share of traded versus non-traded goods and services within countries. A primary reason for the initial ICP research was to draw attention to an important distinction between the relative contributions of traded to non-traded goods and services to the economy and thus of exchange rates to price levels. It was argued that the prices of traded goods would converge toward their openly marketed international level so that currency exchange rates would reflect a country's engagement in trade, but that the prices of non-traded goods would reflect internal wage rates and earnings. In particular, developing countries with large service sectors operating with low wage levels would generally have much lower price levels, a feature confirmed by all successive ICP phases.

An international inflation measure incorporating all these features and obtained simply from the aggregation of

reported national price change, as given by a country's GDP deflator - even if calculated alongside similar regional measures for comparison purposes - is little more than a derived statistical artefact. Obtained primarily as an explicit global inflation indicator, and not for its possible compatibility with an implicit growth measure, the most appropriate index of international inflation would require a level of PPP expenditure weighting. And this should be according to the degree of disaggregation of product group outlays available for the time period chosen. Since national price changes are measured using own currency expenditure weights, a truly comparable measure of price change needs to have all basic expenditure headings expressed in international price, that is, in PPP-converted terms. The construction of any such aggregate global inflation index, however, comes up against the simple but very real practical problem: that PPP GDP estimates are not available for all expenditure categories, nor for all years under investigation, and not for every country, at least not as an independently observed - as opposed to econometrically estimated - measure.

The national indebtedness of the public sector, of corporations, and of ordinary households who are consistently encouraged to spend rather than save, and the evident weaker capacity of all these groups to repay what they have borrowed, have all contributed to weaker sentiment and calls for greater monetary security. The resulting higher borrowing costs, combined with currency 'monetization' and associated expansions in the money supply, lie buried somewhere in the root causes of inflation.

Historically, any temporary disequilibrium between an excessive demand and a limited supply on the market has invariably pushed up price levels. Spec-

ulative buying and funds transfers in weakly regulated banking environments add to uncertainty and increase the imperative to raise precautionary cover. 'Ex ante' expectations also tend to run ahead of an 'ex post' capacity to deliver with a consequent effect on the desired rates of return and volume of counter-part real goods and services demanded. With their added effect on interest and exchange rates, the absence of effective control has proved to be a major source of recent monetary instability. This has added pressure on national and international price levels.

Some price changes can be controlled by state intervention but others occur because certain key commodities are in strong international demand that become scarcer with time. Thus, an important inflationary influence is unavoidably contracted through expanding international demands for energy and essential materials. These are unconscionably absorbed through the degree of a country's integration into the international trading system and global financial economy. While the rate of domestic inflation and how it is related to imported inflation is of prominent interest to a nation's policy makers, it cannot be accounted for entirely by these apparent imbalances in the supply of goods and services. Global inflation is strongly influenced not just by such supply scarcities, but also by the prevailing rates of inflation in the largest economies. A decision in any one of these major economies to fund increased public expenditure by running up government deficits and increasing public debt rather than by taxation will exert an adverse influence on global price change.

5. Concluding Observations

Global inflation is an imprecisely defined and elusive phenomenon and is

not the same as what has been conventionally measured as international inflation. In each country, global inflation is part 'transnational', part 'international', and part 'national'. To obtain a better insight into these and other spatial-temporal economic features, the ability of the ICP to provide a longitudinal 'panel' perspective is crucial. One way to approach such questions might be to take, in the first instance, a common set of countries that have participated in the past three ICP phases and examine how well the results, though dominated by the OECD group, stand up to the test of time, given the different growth rates and social conditions in the countries concerned. Recent studies in the Asia-Pacific region on ways to achieve a closer harmonization between the ICP and the established CPI data process indicate the direction in which such research could proceed and the steps that would need to be taken to achieve the objective of data integration. These include the clearer specification of items and more precise stratification linked to relevant sampling methods demanded. Combined with matrices of binary price similarity coefficients derived from the ICP results, it may prove much easier to track the path of change and define the analytical direction to follow.

In the final analysis, the analytical value of any index depends on the purpose for which it is designed. If the intention of policy is to measure the changing cost in local currencies of trading in the international market, or of acquiring a given volume of goods and services - just as a tourist might do when travelling to different parts of the world - then a simple exchange rate-based index may be suitable. For measuring overall price changes, internationally, it is only appropriate to use PPP weights at the country level. In global comparisons, it is also

preferable to apply international price-weighted domestic expenditure outlays when computing component indices of national price change.

In its simplest form, global inflation is a temporal indicator that measures the aggregate rate of increase of these national prices averaged across all countries. An index formed by applying GDP expenditure base weighted of all observed (reported) national price increases in every country, either proxied by the CPI or measured by the GDP deflator, is a form of global index. But it is not a useful policy measure 'fit for much purpose' unless the relevant choice of weights for a global inflation index is made. The correct selection of weights is not a trivial practical or conceptual question. Price changes occur in domestic markets because they are influenced by local demand and supply conditions expressed in domestic values. These values relate to outlays that have been determined on the basis of national prices that may only partially reflect international 'trade' prices in exchange rate terms. But these prices do determine how consumers react to the market.

How global inflation should be measured is more open to debate. Should it be done by base year price series weighted by PPP expenditures, chain-linked or computed from the observed differences in international price levels obtained between two benchmark PPP survey dates? In principle, only the last index would yield the symmetry desired between output growth and price change across countries in a consistent and comparable way. It is not, however, base country invariant and it is not independent of the underlying economic change between the benchmarks. To give an example, in 1965, the rate of exchange of the US dollar (the chosen currency with which to determine inter-

national dollars) to the UK pound was fixed at $\$2.80 = \pounds 1.00$. Five years later the dollar exchange rate had improved to $\$2.40 = \pounds 1.00$. By 1985 the dollar had nearly doubled in strength to a rate below $\$1.40 = \pounds 1.00$ (touching, at one stage in early March of that year, below $\$1.10 = \pounds 1.00$); yet, by late 2007, the dollar had fallen back in value to $\$2.08 = \pounds 1.00$. What does this mean for international comparisons if the dollar is taken as the PPP base?

In the earlier period described above, when the US was a major manufacturer and a dominant supplier of certain capital goods, the international price trend would have been firmly upwards. Of late, the effect of the US economy on global prices has been less because of the decline in the dollar's value. The US is no longer the major supplier of investment goods and the prime focus of policy attention remains the domestic market. At the same time, on the international market, oil is priced in US dollars, and so the price per barrel rises proportionately to compensate for the decline in the dollar's value. Price hikes are further aggravated by supply shortages and escalating demand.

Many endogenous and exogenous factors feed into global inflation. They serve to emphasize the point that the effective control of global economic conditions and problems has to be taken firmly under the wing of international agreement and policy cooperation that is well informed by sound internationally comparable data. The potential agenda for new research is enormous. ■



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Purchasing Power Parity Comparisons in Health

One of the primary motivations behind adopting purchasing power parity (PPP) vis-à-vis market exchange rates is that it enables more meaningful cross-country comparisons of material well-being. The basic premise underlying PPP-based comparisons is that a dollar in a low-income country such as Ethiopia buys much more than it does in the US. This is primarily because the relative price of non-tradable goods and services is much lower in Ethiopia than in the US. Hence, the PPP-converted estimate of Ethiopia's income is much higher than what it would be if it were converted to a dollar equivalent using market exchange rates.

In this article, we focus on the issue of PPP comparisons in health, which is a key component of individual and societal welfare—one that is valued irrespective of its impact on other factors such as productivity and economic growth. This is evident in the conceptualization of the Millennium Development Goals (MDGs), for instance, whereby attainment of improvements in health is an important target. Likewise, health is also a key dimension of other welfare indicators such as the UNDP's Human Development Index (HDI).

In discussing the issue, we specifically ask the following questions: Does it make any sense to compare prices of a “representative” basket of health goods and services globally when the countries under review have vastly different disease burdens, health financing systems, and quality of care? How useful are health PPPs from an analytical and policy-making perspective? We highlight some of the ways in which

international price comparisons of health goods and services are important from both a research as well as policy-making perspective, despite the fact of health being “comparison-resistant”. However, we also argue that some key methodological issues still remain that need to be addressed specifically with regard to estimation of health PPPs in future rounds of the International Comparison Program (ICP).

Recent methodological innovations have recognized that metrics of population well-being such as the state of one's health also suffer from problems of cross-country comparability in ways not dissimilar to those underlying PPP comparisons of income. For instance, life expectancy rates may not be strictly comparable across countries given the fact that one year of life lived in Ethiopia would not equal one year of life lived in the US – even in simple health terms, because of the higher rates of morbidity in Ethiopia. Hence, two countries with similar life expectancies could have dissimilar “health-adjusted” life expectancies (HALEs) if the incidence of illness and associated disabilities are higher in one than the other. In other words, just as a dollar in the US is not the same as a dollar in Ethiopia because of differences in purchasing power, a year of life expectancy is not the same in Ethiopia and the US, given the differences in healthy time that year of life represents in the two countries.

The above observations, at least from a theoretical perspective, highlight the point that health PPPs ought to focus on what it costs consumers to purchase units

continued

Currently, health PPP comparisons are skewed toward a consumption perspective. However, from a policy-maker perspective, one of the advantages of cross-country health price comparisons would be from a production perspective: i.e., controlling for quality differences. This would enable some ability to separate out the extent to which efficiency considerations play a role in driving price differentials.

of health – measured in terms of gains in healthy life expectancy – across countries. It would then be clearly meaningful to say that a given amount of money in one country buys more healthcare than the same amount in another country. This explains why there is a need for a correction for such a difference in purchasing power for buying healthcare.

However, given all the inherent difficulties of measuring healthcare outputs in national accounts and pricing healthy life expectancy or some other similar health measure, comparison across countries can be made only by comparing the costs of inputs. The focus of health PPPs has, therefore, been on international comparisons of the prices of health goods and services across countries. Does it cost less to see a doctor in Ethiopia than in the United States? Is the price of 10g of generic paracetamol in Addis Ababa the same as in Washington, DC?

It is estimated that a typical country spends 42 percent of its government health expenditure on wages and salaries of health workers. Given the large component of labor input in the health sector, PPP comparisons of the price of health goods and services can be useful to correct differential prices of non-tradeables across countries. In addition, differentials in purchasing power in health are important in understanding how countries such as China, Cuba, Sri Lanka, Vietnam, and Costa Rica – as well as states such as Kerala within countries like India – have managed to attain health indicators that are comparable to those in more developed countries: health (and, for that matter, education) services cost less in low-income countries and this is one factor that can help explain why some relatively poor countries have attained impressive health indicators with relatively low resource envelopes.

A comparative analysis of health prices can also be critical for assessing and

informing other aspects of health policy-making. A recent case in point relates to analysis of fiscal space for health defined by Heller (2006) as the ability of governments to increase spending on health in a financially sustainable manner. An escalation in health prices would significantly erode (in real terms) any increases in fiscal space that may be available for health. And, as is generally the case, rising health prices often are a result of ways in which the health system is organized in terms of provider payment mechanism and the availability of incentives for domestic drug production. Recent estimates of ICP price levels in the health sector for the Asia-Pacific reveal, for instance, that health prices in Indonesia and the Philippines were significantly higher than those in Sri Lanka, Thailand, Vietnam, and India (Table 1). This cross-country regional comparison of prices can be an important indicator meriting policy attention from a fiscal space perspective.

Recent surveys in development assistance for health (DAH) also make the trend analysis of health price data of particular utility. There has been a significant rise in DAH to low-income countries – from US\$2.5 billion in 1990 to over US\$13 billion in 2005 – and there are concerns that such a huge injection of external funds into the health sector, primarily for vertical disease-specific programs, has had a distortionary impact on raising relative prices and health wages. Time series analysis of the trends in external inflows of health-specific funds and health prices can provide useful policy-relevant information to the extent that there is a problem with regard to this issue.

However, despite its utility, several key problems remain with regard to health PPP comparisons. One fundamental issue – the fact that the question of the extent to which seeing a doctor or taking a paracetamol translates into health gains in Ethiopia versus the US – which is re-

ally the core of health PPP measure is left largely unaddressed in the current way health PPP comparisons are made. This is a key methodological challenge that merits further attention in future iterations of ICP. How can we tie the pricing of health goods and services more closely with health output gains from utilizing these goods and services? One option – which may not be practical – would be to parse out items in the health basket more carefully. For instance, to be truly comparable, one would need to price what it costs to see a doctor in a health facility where one may have to walk 5 km, wait 2 hours, where drugs may be available only 50 percent of the time, where equipment does not always work, and where electricity is available only sporadically across both low-income and high-income countries. In other words, one would need to tease out, to the extent possible, differences in prices that are caused by differences in the type of goods and services contained therein. If lower prices imply lower qual-

Table 1. Health and overall price indices in selected Asian countries, 2005 (Hong Kong=100)

Country	Overall price index	Health price index
Bangladesh	48	27
Cambodia	43	18
China	58	22
Hong Kong	100	100
India	45	18
Indonesia	55	49
Lao PDR	38	16
Malaysia	63	45
Mongolia	47	19
Nepal	43	21
Pakistan	44	23
Philippines	54	44
Singapore	89	89
Sri Lanka	48	24
Thailand	54	36
Vietnam	41	19

Source: ADB (2007)

ity of care in low-income countries, the information content of any health PPP comparisons is significantly eroded.

Furthermore, from a cross-country perspective, it is important to understand to what extent differences in health prices are due to “true” differences in input prices as well as the extent to which they are reflecting differences in the efficiency of production of health goods and services. Currently, health PPP comparisons are skewed toward a consumption perspective. However, from a policy-maker perspective, one of the advantages of cross-country health price comparisons would be from a production perspective: i.e., controlling for quality differences. This raises a question: are lower prices reflecting a greater efficiency in the production of a health goods and services? In terms of unit price collection, this would entail gathering of data on inputs into the production of items in the health basket. This would enable some ability to separate out the extent to which efficiency considerations play a role in driving price differentials.

With regard to the choice of health goods and services in future ICP rounds, it would be useful to assess the extent to which a typical household incurs expenses on items included in the health basket. Given that a majority of health spending in low-income countries is private, does the ICP sampling-frame adequately capture all manner of private providers? In this regard, the augmentation of the current ICP round with surveys of the poor in selected countries is a welcome addition, as it will hopefully help shed light on some of these issues.

Another challenge relates to collection of prices of health goods and services across countries in which significant differences in institutional arrangements with regard to health financing exist. There are different modalities of health financing (e.g., the UK-style tax-financed National

Health Service (NHS) system, social health insurance-dominated systems, and private health insurance-dominated systems) and each of these modalities has different implications for prices that consumer face at the point of contact with health providers. The current round of ICP estimates “cost-of-production” prices with government provision and provider prices for private provision, the latter reflecting final prices charged by providers (whether the payer is a household or an insurance company or a mix of the two) when estimating health PPPs. This approach, however, discounts the utility that consumers may get as a result of protection from catastrophic health expenditures and does not account for informal payments that are widely prevalent in many low- and middle-income countries.

A related issue in the analysis of health spending is the “zero-inflation” problem. Relatively high levels of health expenditure in a given country or among a selected population sub-group may reflect many things: higher prices, poor health status, and/or poor levels of risk-pooling, for instance. On the flip side, low levels of health spending could mean good health status or poor access to health care (either physical or financial). Hence, the so-called “zero-inflation” problem that doesn’t spend anything on health could be doing so for distinctly different reasons, some because they are healthy and don’t need health care and others that need health care but cannot access it. In terms of data collection, both groups are recorded in the same manner. It is not clear to what extent health PPPs capture such differences in the nature of health spending.

One promising avenue to explore about the pricing of health provision would be to triangulate estimates of the costs of providing interventions (e.g., those done in the context of attaining MDGs) with information obtained from health PPP exercises. There has been a

virtual explosion of costing estimates across countries – some of these are related to cost-effectiveness analyses – and some of the costing exercises estimate numbers for fairly standardized interventions that would be comparable across countries. And the costing, if done properly, would account for both recurrent and capital expenditures incurred in provision of interventions. Although some of the problems related to quality et al would remain, the advantage would be a more standardized estimation of cost differentials for a given package that could be directly tied to attainment of certain health outputs and outcomes.

In summary, the use of ICP for computing health PPPs is of significant utility for a variety of reasons, not all of which have been mentioned here. However, there are still significant rooms for taking a fresh look at how the information content of health PPPs may be enhanced in future rounds of ICP data. Clearly, one challenge is to ensure that price data accurately account for differences in the institutional arrangements across countries with regard to health financing. It would be extremely useful if health data could be collected both from a provider as well as a consumer perspective, to the extent feasible, as both perspectives would reveal different bits of valuable information regarding the functioning of a country’s health system. Another challenge has to do with accounting for differences in quality of healthcare across countries (as well as within countries), an issue that has much more significance for the health sector – given the life-and-death implications involved – as opposed to other sectors. Costing and comparing a package of services for well-defined interventions may be a promising source of additional information that could be incorporated into augmenting data from the more-standard health price surveys collected as part of the ICP program. ■

2005 ICP Global Results: Summary Table

	Gross domestic product per capita		Gross domestic product, billions		Price level index	GDP per capita indices (US=100)		GDP per capita indices (World=100)		PPP	Reference Data	
Economy	PPP	US\$	PPP	US\$	US=100	PPP	US\$	PPP	US\$	US\$=1	XR ^a (US\$=1)	POP ^b mln
Africa												
Angola	3,533	1,945	55.0	30.3	55	8.5	4.7	39.4	26.9	44.49	80.79	15.56
Benin	1,390	579	10.5	4.4	42	3.3	1.4	15.5	8.0	219.58	527.47	7.53
Botswana	12,057	5,712	20.5	9.7	47	28.9	13.7	134.4	79.0	2.42	5.11	1.70
Burkina Faso	1,140	433	14.6	5.5	38	2.7	1.0	12.7	6.0	200.23	527.47	12.80
Burundi ^c	...	...	...	...	32	...	...	...	...	342.96	1,081.58	7.55
Cameroon	1,995	950	35.0	16.6	48	4.8	2.3	22.2	13.1	251.02	527.47	17.53
Cape Verde	2,831	2,215	1.4	1.1	78	6.8	5.3	31.6	30.6	69.36	88.65	0.48
Central African Republic	675	338	2.7	1.4	50	1.6	0.8	7.5	4.7	263.74	527.47	4.00
Chad	1,749	690	14.9	5.9	39	4.2	1.7	19.5	9.5	208.00	527.47	8.52
Comoros	1,063	611	0.6	0.4	57	2.6	1.5	11.9	8.5	226.19	393.38	0.61
Congo, Dem. Rep.	264	120	15.7	7.1	45	0.6	0.3	2.9	1.7	214.27	473.91	59.52
Congo, Rep.	3,621	1,845	12.0	6.1	51	8.7	4.4	40.4	25.5	268.76	527.47	3.32
Côte d'Ivoire	1,575	858	30.1	16.4	55	3.8	2.1	17.6	11.9	287.49	527.47	19.10
Djibouti	1,964	936	1.5	0.7	48	4.7	2.2	21.9	12.9	84.69	177.72	0.75
Egypt, Arab Rep. ^d	5,049	1,412	353.4	98.8	28	12.1	3.4	56.3	19.5	1.62	5.78	70.00
Equatorial Guinea	11,999	6,538	12.2	6.6	54	28.8	15.7	133.7	90.4	287.42	527.47	1.01
Ethiopia	591	154	42.5	11.1	26	1.4	0.4	6.6	2.1	2.25	8.67	72.06
Gabon	12,742	6,190	17.8	8.7	49	30.6	14.9	142.0	85.6	256.23	527.47	1.40
Gambia, The	726	192	1.1	0.3	26	1.7	0.5	8.1	2.7	7.56	28.58	1.46
Ghana	1,225	502	26.1	10.7	41	2.9	1.2	13.7	6.9	3,720.59	9,073.80	21.34
Guinea	946	317	8.8	2.9	33	2.3	0.8	10.5	4.4	1,219.35	3,644.33	9.28
Guinea-Bissau	569	234	0.8	0.3	41	1.4	0.6	6.3	3.2	217.30	527.47	1.33
Kenya	1,359	531	47.9	18.7	39	3.3	1.3	15.1	7.3	29.52	75.55	35.27
Lesotho	1,415	777	2.6	1.4	55	3.4	1.9	15.8	10.7	3.49	6.36	1.87
Liberia	383	188	1.2	0.6	49	0.9	0.5	4.3	2.6	0.49	1.00	3.23
Madagascar	988	320	16.8	5.5	32	2.4	0.8	11.0	4.4	649.57	2,005.72	17.05
Malawi	691	230	8.6	2.9	33	1.7	0.6	7.7	3.2	39.46	118.42	12.40
Mali	1,027	468	12.1	5.5	46	2.5	1.1	11.5	6.5	240.09	527.47	11.73
Mauritania	1,691	631	4.8	1.8	37	4.1	1.5	18.8	8.7	98.84	264.80	2.84
Mauritius	10,155	5,053	12.6	6.3	50	24.4	12.1	113.2	69.9	14.68	29.50	1.24
Morocco	3,547	1,952	107.1	59.0	55	8.5	4.7	39.5	27.0	4.88	8.87	30.20
Mozambique	743	347	14.4	6.7	47	1.8	0.8	8.3	4.8	10,909.45	23,323.00	19.42
Namibia	4,547	3,049	9.3	6.2	67	10.9	7.3	50.7	42.2	4.26	6.36	2.04
Niger	613	264	7.7	3.3	43	1.5	0.6	6.8	3.6	226.66	527.47	12.63
Nigeria	1,892	868	247.3	113.5	46	4.5	2.1	21.1	12.0	60.23	131.27	130.70
Rwanda	813	271	7.2	2.4	33	2.0	0.7	9.1	3.8	186.18	557.81	8.80
São Tomé and Príncipe	1,460	769	0.2	0.1	53	3.5	1.8	16.3	10.6	5,558.09	10,558.00	0.15
Senegal	1,676	800	18.1	8.7	48	4.0	1.9	18.7	11.1	251.67	527.47	10.82
Sierra Leone	790	293	4.0	1.5	37	1.9	0.7	8.8	4.0	1,074.12	2,899.20	5.10
South Africa	8,477	5,162	397.5	242.0	61	20.3	12.4	94.5	71.4	3.87	6.36	46.89
Sudan	2,249	994	79.6	35.2	44	5.4	2.4	25.1	13.7	107.68	243.61	35.40
Swaziland	4,384	2,270	4.9	2.6	52	10.5	5.4	48.9	31.4	3.29	6.36	1.13
Tanzania	1,018	360	35.9	12.7	35	2.4	0.9	11.3	5.0	395.63	1,119.36	35.30
Togo	888	405	4.6	2.1	46	2.1	1.0	9.9	5.6	240.38	527.47	5.21
Tunisia	6,461	2,896	64.8	29.0	45	15.5	6.9	72.0	40.0	0.58	1.30	10.03
Uganda	991	345	26.3	9.1	35	2.4	0.8	11.0	4.8	619.64	1,780.67	26.49
Zambia	1,175	636	13.4	7.3	54	2.8	1.5	13.1	8.8	2,414.81	4,463.50	11.44
Zimbabwe ^e	538	...	6.2	...	...	1.3	...	6.0	...	33,068.18	...	11.53
Total	2,223	1,016	1,835.6	839.2	46	5.3	2.4	24.8	14.1			825.74

2005 ICP Global Results: Summary Table

Economy	Gross domestic product per capita		Gross domestic product, billions		Price level index	GDP per capita indices (US=100)		GDP per capita indices (World=100)		PPP	Reference Data	
	PPP	US\$	PPP	US\$	US=100	PPP	US\$	PPP	US\$	US\$=1	XR ^a (US\$=1)	POP ^b mln
Asia/Pacific												
Bangladesh	1,268	446	173.8	61.2	35	3.0	1.1	14.1	6.2	22.64	64.33	136.99
Bhutan	3,694	1,318	2.3	0.8	36	8.9	3.2	41.2	18.2	15.74	44.10	0.63
Brunei Darussalam	47,465	25,754	17.6	9.5	54	113.9	61.8	529.1	356.2	0.90	1.66	0.37
Cambodia	1,453	454	20.1	6.3	31	3.5	1.1	16.2	6.3	1,278.55	4,092.50	13.83
China ^f	4,091	1,721	5,333.2	2,243.8	42	9.8	4.1	45.6	23.8	3.45	8.19	1,303.72
Hong Kong, China	35,680	26,094	243.1	177.8	73	85.6	62.6	397.7	360.9	5.69	7.78	6.81
Macao, China	37,256	24,507	17.6	11.6	66	89.4	58.8	415.3	338.9	5.27	8.01	0.47
Taiwan, China	26,069	15,674	590.5	355.1	60	62.6	37.6	290.6	216.8	19.34	32.17	22.65
Fiji	4,209	3,558	3.5	3.0	85	10.1	8.5	46.9	49.2	1.43	1.69	0.84
India	2,126	707	2,341.0	778.7	33	5.1	1.7	23.7	9.8	14.67	44.10	1,101.32
Indonesia	3,234	1,311	707.9	287.0	41	7.8	3.1	36.1	18.1	3,934.26	9,704.74	218.87
Iran, Islamic Rep.	10,692	3,190	734.6	219.2	30	25.7	7.7	119.2	44.1	2,674.76	8,963.96	68.70
Lao PDR	1,811	508	10.2	2.9	28	4.3	1.2	20.2	7.0	2,988.38	10,655.20	5.65
Malaysia	11,466	5,250	299.6	137.2	46	27.5	12.6	127.8	72.6	1.73	3.79	26.13
Maldives	4,017	2,552	1.2	0.7	64	9.6	6.1	44.8	35.3	8.13	12.80	0.29
Mongolia	2,643	915	6.7	2.3	35	6.3	2.2	29.5	12.7	417.22	1,205.22	2.55
Nepal	1,081	343	27.4	8.7	32	2.6	0.8	12.0	4.7	22.65	71.37	25.34
Pakistan	2,396	769	368.9	118.4	32	5.7	1.8	26.7	10.6	19.10	59.51	153.96
Philippines	2,932	1,158	250.0	98.7	39	7.0	2.8	32.7	16.0	21.75	55.09	85.26
Singapore	41,479	26,879	180.1	116.7	65	99.5	64.5	462.4	371.8	1.08	1.66	4.34
Sri Lanka	3,481	1,218	68.5	24.0	35	8.4	2.9	38.8	16.8	35.17	100.50	19.67
Thailand	6,869	2,721	444.9	176.2	40	16.5	6.5	76.6	37.6	15.93	40.22	64.76
Vietnam	2,142	637	178.1	52.9	30	5.1	1.5	23.9	8.8	4,712.69	15,858.90	83.12
Total	3,592	1,462	12,020.7	4,892.6	41	8.6	3.5	40.0	20.2			3,346.29
CIS												
Armenia	3,903	1,523	12.6	4.9	39	9.4	3.7	43.5	21.1	178.58	457.69	3.22
Azerbaijan	4,648	1,604	38.4	13.3	35	11.2	3.8	51.8	22.2	1,631.56	4,727.00	8.27
Belarus	8,541	3,090	83.5	30.2	36	20.5	7.4	95.2	42.7	779.33	2,153.82	9.78
Georgia	3,505	1,427	15.3	6.2	41	8.4	3.4	39.1	19.7	0.74	1.81	4.36
Kazakhstan	8,699	3,771	131.8	57.1	43	20.9	9.0	97.0	52.2	57.61	132.88	15.15
Kyrgyz Republic	1,728	478	8.9	2.5	28	4.1	1.1	19.3	6.6	11.35	41.01	5.14
Moldova	2,362	831	8.5	3.0	35	5.7	2.0	26.3	11.5	4.43	12.60	3.59
Russian Federation ^g	11,861	5,341	1,697.5	764.4	45	28.5	12.8	132.2	73.9	12.74	28.28	143.11
Tajikistan	1,413	338	9.7	2.3	24	3.4	0.8	15.8	4.7	0.74	3.12	6.85
Ukraine	5,583	1,829	263.0	86.1	33	13.4	4.4	62.2	25.3	1.68	5.12	47.11
Total	9,202	3,934	2,269.2	970.0	43	22.1	9.4	102.6	54.4			246.58

2005 ICP Global Results: Summary Table

Economy	Gross domestic product per capita		Gross domestic product, billions		Price level index	GDP per capita indices (US=100)		GDP per capita indices (World=100)		PPP	Reference Data	
	PPP	US\$	PPP	US\$	US=100	PPP	US\$	PPP	US\$	US\$=1	XR ^a (US\$=1)	POP ^b mln
OECD-Eurostat												
Albania	5,369	2,587	16.8	8.1	48	12.9	6.2	59.9	35.8	48.56	100.78	3.14
Australia	32,798	34,774	671.5	712.0	106	78.7	83.4	365.6	480.9	1.39	1.31	20.47
Austria	34,108	37,056	280.8	305.1	109	81.8	88.9	380.2	512.5	0.87	0.80	8.23
Belgium	32,077	35,852	336.0	375.5	112	77.0	86.0	357.6	495.8	0.90	0.80	10.47
Bosnia & Herzegovina	6,506	3,007	25.0	11.6	46	15.6	7.2	72.5	41.6	0.73	1.57	3.84
Bulgaria	9,353	3,525	72.2	27.2	38	22.4	8.5	104.3	48.8	0.59	1.57	7.72
Canada	35,078	35,133	1,133.0	1,134.8	100	84.2	84.3	391.0	485.9	1.21	1.21	32.30
Croatia	13,232	8,749	58.8	38.9	66	31.8	21.0	147.5	121.0	3.94	5.95	4.44
Cyprus	24,473	22,359	18.6	16.9	91	58.7	53.7	272.8	309.2	0.42	0.46	0.76
Czech Republic	20,281	12,190	207.6	124.8	60	48.7	29.3	226.1	168.6	14.40	23.95	10.23
Denmark	33,626	47,793	182.2	259.0	142	80.7	114.7	374.8	661.0	8.52	5.99	5.42
Estonia	16,654	10,341	22.4	13.9	62	40.0	24.8	185.6	143.0	7.81	12.58	1.35
Finland	30,469	37,262	159.8	195.4	122	73.1	89.4	339.6	515.4	0.98	0.80	5.25
France	29,644	34,008	1,862.2	2,136.3	115	71.1	81.6	330.4	470.3	0.92	0.80	62.82
Germany	30,496	33,849	2,514.8	2,791.3	111	73.2	81.2	339.9	468.1	0.89	0.80	82.46
Greece	25,520	22,285	282.8	247.0	87	61.2	53.5	284.5	308.2	0.70	0.80	11.08
Hungary	17,014	10,962	171.6	110.6	64	40.8	26.3	189.7	151.6	128.51	199.47	10.09
Iceland	35,630	54,975	10.5	16.3	154	85.5	131.9	397.2	760.3	97.06	62.91	0.30
Ireland	38,058	48,405	157.9	200.8	127	91.3	116.2	424.2	669.5	1.02	0.80	4.15
Israel	23,845	19,749	156.7	129.8	83	57.2	47.4	265.8	273.1	3.72	4.49	6.57
Italy	27,750	30,195	1,626.3	1,769.6	109	66.6	72.5	309.3	417.6	0.88	0.80	58.61
Japan	30,290	35,604	3,870.3	4,549.2	118	72.7	85.4	337.6	492.4	129.55	110.22	127.77
Korea, Rep.	21,342	16,441	1,027.4	791.4	77	51.2	39.5	237.9	227.4	788.92	1,024.12	48.14
Latvia	13,218	7,035	30.4	16.2	53	31.7	16.9	147.3	97.3	0.30	0.56	2.30
Lithuania	14,085	7,530	48.1	25.7	53	33.8	18.1	157.0	104.1	1.48	2.78	3.41
Luxembourg	70,014	80,315	32.6	37.3	115	168.0	192.7	780.4	1,110.8	0.92	0.80	0.47
Macedonia, FYR	7,393	2,858	15.0	5.8	39	17.7	6.9	82.4	39.5	19.06	49.30	2.03
Malta	20,410	14,605	8.2	5.9	72	49.0	35.0	227.5	202.0	0.25	0.35	0.40
Mexico	11,317	7,401	1,175.0	768.4	65	27.2	17.8	126.1	102.4	7.13	10.90	103.83
Montenegro	7,833	3,564	4.9	2.2	45	18.8	8.6	87.3	49.3	0.37	0.80	0.62
Netherlands	34,724	38,789	566.6	632.9	112	83.3	93.1	387.1	536.5	0.90	0.80	16.32
New Zealand	24,554	26,538	100.7	108.8	108	58.9	63.7	273.7	367.0	1.54	1.42	4.10
Norway	47,551	65,267	219.8	301.7	137	114.1	156.6	530.0	902.7	8.84	6.44	4.62
Poland	13,573	7,965	518.0	304.0	59	32.6	19.1	151.3	110.2	1.90	3.24	38.16
Portugal	20,006	17,599	211.0	185.7	88	48.0	42.2	223.0	243.4	0.71	0.80	10.55
Romania	9,374	4,575	202.7	98.9	49	22.5	11.0	104.5	63.3	1.42	2.91	21.62
Russian Federation ⁹	11,861	5,341	1,697.5	764.4	45	28.5	12.8	132.2	73.9	12.74	28.28	143.11
Serbia	8,609	3,564	64.1	26.5	41	20.7	8.6	96.0	49.3	27.21	65.72	7.44
Slovak Republic	15,881	8,798	85.6	47.4	55	38.1	21.1	177.0	121.7	17.20	31.04	5.39
Slovenia	23,004	17,558	46.0	35.1	76	55.2	42.1	256.4	242.8	147.04	192.65	2.00
Spain	27,270	26,031	1,183.5	1,129.7	95	65.4	62.5	304.0	360.0	0.77	0.80	43.40
Sweden	31,995	39,621	288.9	357.8	124	76.8	95.1	356.6	548.0	9.24	7.46	9.03
Switzerland	35,520	49,675	266.3	372.4	140	85.2	119.2	395.9	687.0	1.74	1.25	7.50
Turkey	7,786	5,013	561.1	361.3	64	18.7	12.0	86.8	69.3	0.87	1.35	72.07
United Kingdom	31,580	37,266	1,901.7	2,244.1	118	75.8	89.4	352.0	515.4	0.65	0.55	60.22
United States	41,674	41,674	12,376.1	12,376.1	100	100.0	100.0	464.5	576.4	1.00	1.00	296.97
Total	26,404	26,191	36,469.0	36,173.8	99	63.4	62.8	294.3	362.2			1,381.18

2005 ICP Global Results: Summary Table

Economy	Gross domestic product per capita		Gross domestic product, billions		Price level index	GDP per capita indices (US=100)		GDP per capita indices (World=100)		PPP	Reference Data	
	PPP	US\$	PPP	US\$	US=100	PPP	US\$	PPP	US\$	US\$=1	XR ^a (US\$=1)	POP ^b mln
South America												
Argentina	11,063	4,836	419.0	183.2	44	26.5	11.6	123.3	66.9	1.27	2.90	37.88
Bolivia	3,618	1,001	34.1	9.4	28	8.7	2.4	40.3	13.9	2.23	8.07	9.43
Brazil	8,596	4,791	1,583.2	882.5	56	20.6	11.5	95.8	66.3	1.36	2.43	184.18
Chile	12,262	7,305	199.6	118.9	60	29.4	17.5	136.7	101.0	333.69	560.09	16.28
Colombia	6,306	2,940	263.7	122.9	47	15.1	7.1	70.3	40.7	1,081.95	2,320.75	41.82
Ecuador	6,533	2,761	86.3	36.5	42	15.7	6.6	72.8	38.2	0.42	1.00	13.22
Paraguay	3,900	1,267	23.0	7.5	32	9.4	3.0	43.5	17.5	2,006.83	6,177.96	5.90
Peru	6,466	2,916	176.0	79.4	45	15.5	7.0	72.1	40.3	1.49	3.30	27.22
Uruguay	9,266	5,026	30.6	16.6	54	22.2	12.1	103.3	69.5	13.28	24.48	3.31
Venezuela, ^{RB}	9,876	5,449	262.5	144.8	55	23.7	13.1	110.1	75.4	1,152.88	2,089.75	26.58
Total	8,415	4,379	3,078.1	1,601.7	52	20.2	10.5	93.8	60.6			365.80
West Asia												
Bahrain	27,236	18,019	20.2	13.4	66	65.4	43.2	303.6	249.2	0.25	0.38	0.74
Egypt, Arab Rep. ^d	5,049	1,412	353.4	98.8	28	12.1	3.4	56.3	19.5	1.62	5.78	70.00
Iraq	3,200	1,214	89.5	33.9	38	7.7	2.9	35.7	16.8	558.70	1,473.00	27.96
Jordan	4,294	2,304	23.5	12.6	54	10.3	5.5	47.9	31.9	0.38	0.71	5.47
Kuwait	44,947	32,882	110.4	80.8	73	107.9	78.9	501.0	454.8	0.21	0.29	2.46
Lebanon	10,212	5,741	38.3	21.6	56	24.5	13.8	113.8	79.4	847.52	1,507.50	3.76
Oman	20,334	12,289	51.0	30.8	60	48.8	29.5	226.7	170.0	0.23	0.38	2.51
Qatar	68,696	51,809	55.8	42.1	75	164.8	124.3	765.7	716.5	2.75	3.64	0.81
Saudi Arabia	21,220	13,640	490.6	315.3	64	50.9	32.7	236.5	188.6	2.41	3.75	23.12
Syrian Arab Republic	4,059	1,535	75.0	28.4	38	9.7	3.7	45.2	21.2	19.72	52.14	18.49
Yemen, Rep.	2,276	826	46.2	16.8	36	5.5	2.0	25.4	11.4	69.49	191.42	20.28
Total	7,711	3,955	1354.1	694.5	51	18.5	9.5	86.0	54.7			175.60
WORLD	8,971	7,230	54975.7	44308.7	81	21.5	17.3	100.0	100.0			6,128.08

Notes:

a. Exchange Rate: Refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market. It is calculated as an annual average of local currency units relative to the U.S. dollar. Figures are provided by national authorities participating in ICP and may differ from IMF figures.

b. Population: Estimates are provided by national authorities participating in ICP. The values shown are midyear estimates. Figures may differ from World Bank World Development Indicators figures.

c. Burundi: Submitted prices but did not provide official national account data.

d. Egypt, Arab Rep.: Participated in both the Africa and Western Asia regions. The results for Egypt from each region were averaged by taking the geometric mean of the PPPs, allowing Egypt to be shown in each region with the same ranking in the world comparison.

e. Zimbabwe: Data was suppressed because of extreme volatility in the official exchange rate.

f. China: Results for the PRC were based on national average prices extrapolated by the World Bank and ADB using price data for 11 cities submitted by the National Bureau of Statistics for China. The data for China do not include Hong Kong, Macao, and Taiwan, China.

g. Russian Federation: Participated in both the CIS and OECD-Eurostat comparisons. The PPPs for Russia are based on the OECD comparison. They were the basis for linking the CIS comparison to the Eurostat-OECD program.

... Data suppressed because of incompleteness.

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