

ADB

ERD Policy Brief

ECONOMICS AND RESEARCH DEPARTMENT

SERIES
No. 25

Purchasing Power Parities and the International Comparison Program in a Globalized World

Bishnu D. Pant



Asian Development Bank
6 ADB Avenue, Mandaluyong City
P.O. Box 789
0980 Manila, Philippines
<http://www.adb.org/economics>
ISSN: 1655-5260

Printed in the Philippines

March 2004

Asian Development Bank
<http://www.adb.org/Economics>

Asian Development Bank
P.O. Box 789
0980 Manila
Philippines

©2004 by Asian Development Bank
March 2004
ISSN 1655-5260

The views expressed in this paper
are those of the author(s) and do not
necessarily reflect the views or policies
of the Asian Development Bank.

The ERD Policy Brief Series is based on papers or notes prepared by ADB staff and their resource persons. The series is designed to provide concise nontechnical accounts of policy issues of topical interest to ADB management, Board of Directors, and staff. Though prepared primarily for internal readership within the ADB, the series may be accessed by interested external readers. Feedback is welcome via e-mail (policybriefs@adb.org).

ERD POLICY BRIEF NO. 25

Purchasing Power Parities and the International Comparison Program in a Globalized World

Bishnu D. Pant

March 2004

Bishnu Pant is a Principal Statistician in the Development Indicators and Policy Research Division of the Economics and Research Department, Asian Development Bank. The author thanks Ifzal Ali, Jean-Pierre Verbiest, and Xianbin Yao of Asian Development Bank; and D.S. Prasada Rao, Director, Center for Efficiency and Productivity Analysis, University of Queensland, for their valuable comments and suggestions; and Virginia Gañac for research assistance.

INTRODUCTION

The rapid pace and disparate pattern of economic development and a consequent desire to improve human living conditions through poverty reduction strategies has focused the international community's attention on the need to design and apply a measurement tool that accurately gauges levels of economic development in different countries. This requires a mechanism for converting economic aggregates such as gross domestic product (GDP), expressed in national currencies, into a currency unit that is comparable across countries. The long-standing recognition of the deficiencies of using nominal exchange rates for these comparisons, i.e., the existence of nontraded goods and services in different countries, capital movements, and exchange market intervention, gave rise to the International Comparison Program (ICP), which developed purchasing power parity (PPP) as the most robust and appropriate currency converter for accurately reflecting differences in the levels of prices of goods and services in different countries.

The ICP began as a small-scale project in 1968 but has grown into a major international statistical initiative, receiving support from both the United Nations (UN) and the World Bank. The Organisation for Economic Co-operation and Development and the European Union have also embarked on compilation of PPPs for currencies of their member countries. Even though the ICP has been well patronized by developed countries, participation is less enthusiastic in developing countries in general and developing countries in the Asian and Pacific region in particular. To redress this deficiency, the 2004-2006 round of ICP is being initiated to embrace the whole world covering around 160 countries.

This brief provides an exposition of the importance of PPPs and their role in analysis and comparison of economic data. It also emphasizes the significance of PPPs for developing countries.

WHAT IS PURCHASING POWER PARITY?

Purchasing power parity is a form of exchange rate that shows the number of units of a currency that has the same purchasing power as a given unit of the currency of a reference/base/numeraire country with respect to a basket of goods and services. For example, a PPP of US\$1 = Rs.20, for consumption, implies that 20 rupees have the same purchasing power as one US dollar. Therefore, *PPP can be seen as a price index number for spatial price level comparisons*. It has the same interpretation and application potential as the Consumer Price Index (CPI) statistics compiled on a quarterly basis in almost all countries of the world. The value and meaning of a given PPP is linked inextricably to the reference basket.

The *Big Mac Index* compiled and published by *The Economist* is a celebrated example of a PPP that is based on a single consumption item. It is a very useful illustration of the process of PPP construction, but it is of limited analytical use given the unique and limited nature of the underlying basket. For purposes of economic analyses and international comparisons, PPPs need to cover a much broader and more representative range of goods and services. Indeed a broad variety of PPPs may be constructed depending upon analytical requirements. For example, if the aim is to assess the level of human development and standards of living it is appropriate to measure PPPs covering the full range of goods and services that enter into GDP. However, if one wishes to estimate internationally comparable gross capital stock estimates, PPPs should cover a more restricted set of goods belonging to the “investment” aggregate. Similarly, if the aim is to compile internationally comparable estimates of national, regional, and global poverty, then PPPs based on prices paid by the poor for goods and services that are adequately representative of the consumption needs of the poor are appropriate.

WHY ARE PPPs IMPORTANT?

Meeting the Need for Internationally Comparable Economic Data

In 1988 the United Nations embarked on a major project to standardize the way economic aggregates are compiled and assembled, which came to be known as the 1993 system of national accounts (SNA). As a result, the 1993 SNA recommended a single,

common international framework for statisticians compiling macroeconomic statistics. This ensures that, at least, economic concepts are measured in the same way across countries. However, this investment in the revision of the SNA will only yield returns once the new SNA-based economic aggregates are also defined in a manner that makes them comparable across countries. Furthermore, conceptually and practically, the UN national accounts will only be complete when a common measure for economic aggregates has been adopted that is not affected by exchange rate fluctuations. Significantly, the PPPs from the ICP provide such a measurement tool.

Within the ICP, PPPs are computed from the expenditure side of GDP, which is divided into about 150 categories known as basic headings. PPPs are available for GDP as a whole and also for each of the basic heading levels. The ICP, therefore, provides rich information that can be used for policy purposes. In particular PPPs for basic headings permit sectoral decomposition analysis. PPP-based shares of various expenditure categories, such as investment, are more meaningful and relevant for purposes of analyzing growth potential and performance of developing countries.

Price Levels

The differences in the ICP (PPP-based) and exchange-rate based estimates (World Bank Atlas method) reflect mainly differences in relative price levels, as measured by the ratio of PPP to exchange rates. In general, relative prices are much lower in low-income countries than in high-income countries. Based only on the ICP round of 1985, which had a truly global coverage, the average price level (unweighted average) is 0.34 for low-income countries compared with 0.39 and 0.83 for middle and high income countries respectively (Table 1).

**Table 1. Average Price Levels – 1985 ICP Benchmark Countries
(US price level = 1.00)**

Income Group	GDP	Tradables	Nontradables
Low income	0.34	0.47	0.25
Middle income	0.39	0.47	0.35
High income	0.83	0.91	0.78
World	0.54	0.64	0.48

Source: Ahmad (1997).

Table 1 also shows that the difference in relative price levels between richer and poorer countries is more pronounced in nontradeables or services than in commodities that are commonly traded. The relative price of nontradables or services is only 0.25 compared to 0.47 for tradables. On the other hand, for the high-income group countries, relative prices are 0.78 and 0.91 respectively, which are much closer to each other.

Analysis of Size and Structure of Economies

In any analysis of the impact of globalization, it is necessary to make an assessment of the relative sizes of various economies in different regions. It is also important to examine the share or contribution of various economies to the global economy. The use of PPPs is likely to yield a considerably different ranking of the countries by size and share to that derived using the exchange rates. This phenomenon is illustrated in Table 2.¹

Table 2. **Size and Share of Selected Countries in the World Economy, 2002**

	Gross National Income (million US dollars)		Share in the Global Economy	
	Exchange Rate	PPP	Exchange Rate	PPP
United States	10,110,087	10,110,087	32.1	21.5
People's Republic of China	1,209,528	5,623,480	3.8	12.0
Japan	4,265,616	3,314,644	13.5	7.1
India	501,532	2,694,077	1.6	5.7
Germany	1,870,383	2,163,019	5.9	4.6
France	1,342,735	1,556,192	4.3	3.3
United Kingdom	1,486,194	1,522,656	4.7	3.2
Italy	1,097,944	1,466,509	3.5	3.1
Brazil	497,393	1,265,016	1.6	2.7
Russia	307,913	1,126,635	1.0	2.4
Canada	700,454	881,791	2.2	1.9
Mexico	596,703	704,507	1.9	1.5
Spain	594,114	842,543	1.9	1.8
World	31,483,939	46,943,864	100.0	100.0

Source: www.worldbank.org/data/databytopic/GNIPC.pdf

¹Exchange rate conversions here refer to the Atlas methodology used by the World Bank. Exchange rates used in the Atlas method are based on three-year averages of real exchange rates.

Table 2 shows that the PRC is the world's second largest economy when PPPs are used to convert gross national incomes into US dollars. On the other hand, Japan is the second largest economy when exchange rates are used for the comparison. The last two columns of Table 2 clearly demonstrate the differences in the shares of different countries.

Similarly, Table 3 below illustrates trends in shares of low, middle, and high-income country-groups.²

**Table 3. Trends in Shares of Groups of Countries
(converted using exchange rates and PPPs)**

Country Group	Exchange Rates			ICP (PPPs)		
	1987	1995	2002	1987	1995	2002
Low-income	6	5	3	13	18	11
Middle-income	16	14	16	26	24	33
High-income	78	81	81	61	58	56
World	100	100	100	100	100	100

Source: <http://www.worldbank.org/data/databytopic/GNIPC.pdf>.

There are interesting differences resulting from the use of the different conversion factors. Notably, the general contribution of the high-income countries decreases from around 80 percent using exchange rates, to 60 percent using PPPs. Conversely, the shares of middle- and low-income countries increase. The share of middle-income countries shows a significant increase over the period 1987 to 2002. This is indeed an encouraging sign showing declining global inequality. In particular, Table 3 shows that between-group (country groups) inequality is declining over time.

Composition of GDP

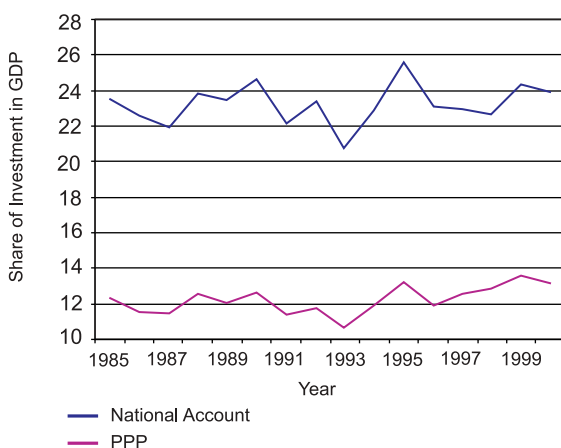
Data resulting from the ICP can alter perceptions of the general structure of the economies. The volume of services in GDP does not increase with the level of income, only their prices. Investment as a share of total GDP (evaluated using PPPs) is much lower in poorer countries than the national accounts figures indicate because relative prices of investment goods are usually very high. This implies that while the share of investment, in national prices, may appear healthy,

²The classification is adopted from the *World Development Report* (2003).

the real volume underlying such investment is lower. This explains why growth rates in some poorer countries are lower.

For example, Figure 1 shows the share of investment in India's gross domestic product. These are calculated using data drawn from the latest Penn World Tables (Heston et al. 2002). If national prices are used, the share fluctuates between 21 and 25 percent. However, when PPPs are used, the share of investment is around 12 percent throughout the period under consideration.

Figure 1. **Share of Investment in GDP**
National Accounts vs. PPP-based, India (1985-2000)



Global and Regional Inequality

Any assessment of global and regional inequality requires conversion of national currency per capita income into a common currency unit. Table 4 shows the per capita income of selected countries converted into US dollars using exchange rates and PPPs.

**Table 4. Per Capita Incomes in Selected Countries
(US dollars)**

Countries	1987		1995		2002	
	Exchange Rate	PPP	Exchange Rate	PPP	Exchange Rate	PPP
United States	19,800	19,800	27,830	27,830	35,060	35,060
Japan	17,240	14,850	38,850	22,820	33,550	26,070
Germany	19,800	14,727	27,620	20,700	22,670	26,220
People's Republic of China	400	1,230	620	2,940	940	4,390
India	330	880	350	1,460	480	2,570
Malaysia	1,940	4,530	4,000	9,360	3,540	8,280
Kenya	370	1,130	260	1,440	360	950
South Africa	2,020	4,360	3,160	5,150	2,600	9,870
Tanzania	230	510	130	690	280	550

Sources: Ahmad (1997) for 1987 and 1995 estimates, and World Bank website for the 2002 estimates.

An interesting feature of the per capita income estimates provided in Table 4 is that for all the developed countries, exchange rate-converted incomes are close to or even somewhat higher than those derived using PPPs. In contrast, for the developing countries, the PPP-converted incomes are uniformly higher than the exchange rate-based incomes. As a result, any measure of global inequality is significantly influenced by the choice of the conversion factor, a conclusion supported by recently reported research (Milanovic 2002).

PPPs for Global and Regional Poverty Measurement

The World Bank generates poverty data based on a simple and unifying concept of a poverty line that is set at an arbitrary level of \$1 a day or \$2 a day. While this poverty line appears to be somewhat simplistic and quite remote from the poverty threshold level of the countries concerned, it is still of considerable value for purposes of mobilizing regional or global attention to the problem of poverty alleviation. It is quite possible to create a strong impression about how poor are the poor when \$1 a day is considered to be the poverty line. In a developed world, the purchasing power of a dollar is so limited that these estimates are bound to impress the general population. The ICP offers appropriate PPPs for the implementation of the World Bank's methodology. The PPP-based poverty measures

can be used by developing countries for measuring poverty and formulating and evaluating their own poverty reduction programs.³

Intracountry Regional Comparisons

The applications discussed above need not necessarily apply only to cross-country analyses. In fact some of these are more relevant in the context of monitoring economic progress among different regions within a country. In the cases of particularly large countries like People's Republic of China, India, and Indonesia, regular compilation of PPPs of currencies in different regions or provinces provides useful data for spatial comparison of prices across regions. These, in turn, can be used in making real income comparisons across regions or provinces. Such data are crucial in developing strategies for balanced regional development, and also useful in compiling Human Development Indexes (HDI) at provincial and district levels. PPPs at a more disaggregated level can be used in identifying regions that are more price-competitive. This information can then be used in making informed policy decisions regarding allocation of scarce resources for the benefit of the national economy.

There are other significant uses of PPPs as well. PPPs can be used in measuring price competitiveness of various sectors of the economy. For example, Dwyer et al. (2001) used consumption PPPs at the disaggregated level and expenditure patterns of tourists from different countries to assess the price competitiveness of various tourist destinations. Similar applications can assess if certain types of goods and services are cheaper in some countries, thereby assisting multinational companies in making investment decisions and even in calibrating salaries and working conditions of their employees. ICP data are also used by several international development agencies for policy-related economic analyses. UNDP's HDI is a composite index of GDP per capita adjusted by PPP, a health indicator using life expectancy and an education indicator based on school enrolment and literacy rates. In addition to the calculated PPPs, the detailed item "specific information on prices and price ratios" collected under the ICP can prove useful in providing fresh cross-country perspectives on comparative market distortions, competitiveness, and relative efficiency. In the age of globalization, knowledge regarding a country's

³Some economists, however, argue that PPPs are the source of tremendous volatility for global poverty estimates and hence dependence of the international poverty line on PPP exchange rates should be eliminated (Deaton as cited in Quibria 2003).

relative price level with its neighbors is relevant for making decisions on international trade and tourism, and in setting fiscal and monetary policies.

CHALLENGES FOR THE 2004-2006 ICP ROUND IN ASIA

Despite the many uses for ICP data, the limited involvement of developing countries in past ICP rounds can be explained by several factors. In these countries, the ICP was viewed as a financially burdensome statistical exercise largely driven by the needs of international agencies.

In order to reduce financial burden, efforts are being made to integrate ICP with the regular price data collection programs of the statistical agencies in the 2004-2006 ICP currently under way. The national statistical organizations (NSOs) are now preparing the regional product lists based on their respective lists of representative commodities. This consultation process helps not only in securing their commitment to the program but also in the integration of ICP activities into the regular work programs of the DMCs. As a result, in the current round, the NSOs, despite resource constraints, have shown strong commitment to the program not only by agreeing to participate but also by contributing in kind.

As ICP strives to bring more countries into the program, the need to identify country-level development policy applications of ICP results and to make country statisticians and policymakers aware of such benefits becomes all the more crucial. ICP data have acceptance in the academic world, but their use in policies of national governments has, however, been very limited. There is an imperative for planning regional workshops on "Using PPPs for National Policy Purposes" to advocate the importance of PPP data in policy making.

In the 2004-2006 round of the ICP, various regional institutions throughout the world are taking the lead role in designing and implementing the program including capacity building in the NSOs. For example, the Asian Development Bank (ADB) has assumed the role of a regional implementing agency in the Asian and Pacific region. ADB is responsible for ensuring the success of ICP through increased participation of countries of the region. It is also responsible for synchronizing regional activities with global activities, conducting price surveys, compiling and disseminating results, and promoting their uses. Through its involvement in the next round of the ICP, ADB is striving to fulfill its major role as a regional supporter of statistical

capacity-building activities, as a provider of important economic data for all stakeholders in the region, and also as a promoter of informed policy making in the developing countries of the region. The basic philosophy underpinning this initiative is that what cannot be measured cannot be managed. Given the many possible uses of PPPs, they are instrumental for measuring a variety of development indicators that will form the basis for more informed policy formulation.

SELECTED REFERENCES

- Ahmad, S., 1997. "International Comparison of Incomes: Why Should One Bother Using PPP Conversions." DECDG, The World Bank, Washington, D.C. Mimeographed.
- Dwyer, L., P. Forsyth, and D.S. Prasada Rao, 2001, "PPPs and Price Competitiveness of International Tourism Destinations." Paper presented at the OECD-World Bank Seminar on Purchasing Power Parities: Recent Advances in Methods and Applications, January, Washington D.C.
- Heston, A., R. Summers, S., and B. Aten, 2002. *Penn World Table Version 6.1*. Center for International Comparisons, University of Pennsylvania, Philadelphia.
- McCarthy, P., K. Woolford, L. Pietsch, and P. Harper, 2002. "Improving Knowledge and Analysis of Changes in Poverty and Inequality: The International Statistical Architecture." Paper presented at the G-20 Workshop on Globalization, Living Standards and Inequality: Recent Progress and Continuing Challenges, Sydney, Australia, 26-28 May.
- Milanovic, B., 2002. "True World Income Distribution, 1988 and 1993: First Calculation Based on Household Surveys Alone." *The Economic Journal* 112:51-92.
- Quibria, M. G., 2003. The Millennium Development Goals and Poverty: Are We Counting the World's Poor Right. ERD Policy Brief No. 20, Economics and Research Department, Asian Development Bank, Manila.
- Ward, M., 2002. "Purchasing Power Parities vs. Exchange Rates in International Comparisons." *Statistical Journal of the United Nations Economic Commission of Europe* 19:261-76.

ERD POLICY BRIEF SERIES

- No. 1 Is Growth Good Enough for the Poor?
Ernesto M. Pernia
October 2001
- 2 India's Economic Reforms
What Has Been Accomplished?
What Remains to Be Done?
Arvind Panagariya
November 2001
- 3 Unequal Benefits of Growth in Viet Nam
Indu Bhushan, Erik Bloom, and Nguyen Minh Thang
January 2002
- 4 Is Volatility Built into Today's World Economy?
J. Malcolm Dowling and J.P. Verbiest
February 2002
- 5 What Else Besides Growth Matters to Poverty
Reduction? Philippines
Arsenio M. Balisacan and Ernesto M. Pernia
February 2002
- 6 Achieving the Twin Objectives of Efficiency and Equity:
Contracting Health Services in Cambodia
Indu Bhushan, Sheryl Keller, and Brad Schwartz
March 2002
- 7 Causes of the 1997 Asian Financial Crisis:
What Can an Early Warning System Model Tell Us?
Juzhong Zhuang and Malcolm Dowling
June 2002
- 8 The Role of Preferential Trading Arrangements
in Asia
Christopher Edmonds and Jean-Pierre Verbiest
July 2002
- 9 The Doha Round: A Development Perspective
Jean-Pierre Verbiest, Jeffrey Liang, and Lea Sumulong
July 2002

- 10 Is Economic Openness Good for Regional Development and Poverty Reduction?
The Philippines
Ernesto M. Pernia and Pilipinas F. Quising
October 2002
- 11 Implications of US Dollar Depreciation for Asian Developing Countries
Emma Xiaoqin Fan
November 2002
- 12 Dangers of Deflation
Douglas H. Brooks and Pilipinas F. Quising
December 2002
- 13 Infrastructure and Poverty Reduction—
What is the Connection?
Ifzal Ali and Ernesto Pernia
January 2003
- 14 Infrastructure and Poverty Reduction—
Making Markets Work for the Poor
Xianbin Yao
May 2003
- 15 SARS: Economic Impacts and Implications
Emma Xiaoqin Fan
May 2003
- 16 Emerging Tax Issues: Implications of
Globalization and Technology
Kanokpan Lao-Araya
May 2003
- 17 Pro-Poor Growth—What is It and How is It
Important?
Ernesto M. Pernia
June 2003
- 18 Public–Private Partnership for Competitiveness
Jesus Felipe
June 2003
- 19 Reviving Asian Economic Growth Requires
Further Reforms
Ifzal Ali
June 2003
- 20 The Millennium Development Goals and Poverty:
Are We Counting the World’s Poor Right?
M. G. Quibria
July 2003

- 21 Trade and Poverty: What are the Connections?
Douglas H. Brooks
July 2003
- 22 Adapting Education to the Global Economy
Olivier Dupriez
September 2003
- 23 Foreign Direct Investment: The Role of Policy
Douglas H. Brooks and Lea R. Sumulong
December 2003
- 24 Avian Flu: An Economic Assessment for Selected
Developing Countries in Asia
Jean-Pierre A. Verbiest and Charissa N. Castillo
March 2004
- 25 Purchasing Power Parities and the International
Comparison Program in a Globalized World
Bishnu D. Pant
March 2004

For information and to order, write to
Office of External Relations, Asian Development Bank
P.O. Box 789, 0980 Manila, Philippines
or e-mail adbpub@adb.org