

OECD National accounts

Purchasing Power Parities

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Questions about PPPs and answers

Increasing globalisation and economic interdependence among countries have generated increasing requirements for macroeconomic tools which can produce internationally-comparable data. Purchasing Power Parities are key statistical tools for international volume comparisons. However, there is clearly a lack of understanding of the methodology underlying PPPs and also of how and when PPPs should be used. This section is designed to provide answers to a number of questions that are asked about PPPs and will be regularly updated.

Definition of PPPs

Q: What are PPPs?

A: PPPs are the rates of currency conversion that equalise the purchasing power of different currencies by eliminating the differences in price levels between countries. In their simplest form, PPPs are simply price relatives which show the ratio of the prices in national currencies of the same good or service in different countries. For example, if the price of a cauliflower in France is 8.00 francs and in the United States it is 1.50 dollars, then the PPP for cauliflower between France and the United States is 8.00 francs to 1.50 dollars or 5.33 francs to the dollar. This means that for every dollar spent on cauliflower in the United States, 5.33 francs would have to be spent in France to obtain the same quantity and quality - or, in other words, the same volume - of cauliflower.

Q: What are the major uses of PPPs?

A: The major use of PPPs is as a first step in making inter-country comparisons in real terms of gross domestic product (GDP) and its component expenditures. GDP is the aggregate used most frequently to represent the economic size of countries and, on a per capita basis, the economic well-being of their residents. Calculating PPPs is the first step in the process of converting the level of GDP and its major aggregates, expressed in national currencies, into a common currency to enable these comparisons to be made.

Q: How are PPPs calculated?

A: The easiest way to see how a PPP is calculated is to consider a product which is identical in two countries. A simple example would be a litre of Coca Cola. If it costs 15.00 francs in France and \$2.00 in America then the PPP for Coca Cola between France and the USA is 15.00/2.00, or 7.50. This means that for every dollar spent on a litre of Coca Cola in the USA, 7.50 francs would have to be spent in France to obtain the same quantity and quality - or, in other words, the same volume - of Coca Cola. PPPs are not only calculated for individual products; they are also calculated for various groups of products (e.g., refreshments, vegetables) where PPPs are a geometric average of price relatives of various products in the group.

Q: How are PPPs calculated for GDP?

A: The calculation is undertaken in two stages: first, at the product group level as described above and then, at the GDP or any aggregate levels, where the PPPs for the product groups are weighted and averaged to obtain PPPs for these levels. The weights used to aggregate the PPPs are the expenditures on the product groups.

Q: What products are included in the basket of goods and services used for the calculation of PPPs?

A: The basket of goods and services priced for the PPP exercise is a sample of all goods and services covered by GDP. It includes consumer goods and services, government services, equipment goods and construction projects. More specifically, consumer items include food, beverages, tobacco, clothing, footwear, rents, water supply, gas, electricity, medical goods and services, furniture and furnishings, household appliances, personal transport equipment, fuel, transport services, recreational equipment, recreational and cultural services, telephone services, education services, goods and services for personal care and household operation, repair and maintenance services.

Q: How many products are included in the basket of goods and services used for the PPP calculation?

A: The final products list for the 1996 comparison covered around 2,900 consumer goods and services, 34 occupations in government, education and health services, 186 types of equipment goods and 20 construction projects? The large number of price specifications is to enable as many countries as possible to identify goods and services which are representative of their domestic expenditures. However, countries are expected to provide only a relatively small subset of these prices (several hundred in general).

Q: What types of prices are used in the calculation of PPPs and do the prices include taxes?

A: Prices used in the calculation are market prices, i.e. the prices effectively paid by the consumers, and so they include all taxes which affect the final prices paid for products.

Q: Who is responsible for calculating PPPs?

A: Under the Joint OECD-Eurostat PPP Programme, the OECD and Eurostat share the responsibility for calculating PPPs. Broadly, Eurostat handles the calculations for the EU countries and for the EU "Candidate countries" (i.e. those countries which have applied for admission to the EU). The OECD deals with the non-European OECD Member countries and the other non-EU related countries such as Russia, China, Ukraine etc which are included in the PPP Programme.

Q: What is the background to the Joint OECD-Eurostat PPP Programme?

A: The Eurostat PPP Programme commenced in the 1960s to compare the relative price and GDP volume levels within the (then) European Economic Community. In the early 1980s, the Joint OECD-Eurostat PPP Programme was established to provide internationally comparable price and volume measures of GDP and its component expenditures for all the Member Countries of the OECD. Having a joint programme enabled the extent of duplication between the data requests from Eurostat and the OECD to be minimised.

Q: What are the objectives of the PPP Programme?

A: The PPP Programme is both a national accounts and price collection exercise. The prices are collected partly to provide international comparisons of price levels and partly as an essential step in calculating volume comparisons of GDP and its component expenditures.

Q: How often is the OECD PPP Programme conducted?

A: The 1999 round, which is currently under way, is the sixth round of the OECD PPP Programme. The most recent round of the Programme for which benchmark data have been published is 1996. Previous rounds have provided PPP and real expenditures for four benchmark years - 1980, 1985, 1990 and 1993. PPPs for GDP are

extrapolated both monthly and annually from the latest benchmark year. The latest annual estimates for the total PPPs and for per capita volumes of GDP are normally published by the OECD about a month or so after the end of the year to which they refer.

PPPs versus exchange rates

Q: What are the drawbacks to using exchange rates to convert GDP to a common currency for making international comparisons (e.g. of production or productivity)?

A: There are two major disadvantages. First, exchange rates vary from day to day and sometimes change abruptly - perhaps because of speculation against a currency or because of changes in interest rates. If GDP is converted into a common currency using exchange rates, the size of a country's economy can also appear to vary from day to day and undergo abrupt shifts for reasons that have nothing to do with the actual levels of economic activity in that country. This volatility can be overcome to some extent by using averaging devices, such as the Atlas method employed by the World Bank, although the results can be distorted if exchange rates change rapidly. A second disadvantage is that exchange rates do not simply reflect the relative prices of goods and services produced in a country - they are affected by the relative prices of tradable goods and by factors such as interest rates, financial flows etc. So the use of exchange rates to convert a service such as a haircut may give misleading results and the PPP approach is preferred conceptually in such cases. When the GDP of different countries is converted to a common currency using PPPs, they are all being valued at a common set of prices. As with a time series of GDP at constant prices, it then becomes possible to compare the underlying volumes.

Q: Can average exchange rates be used as proxies for PPPs?

A: PPP converted GDPs make better economic sense than do exchange rate converted GDPs. Exchange rate fluctuations can make it appear that countries have suddenly become "richer" or "poorer" even though in reality there has been no change in the volumes of goods and services produced. A moving average of exchange rates does not provide a more plausible picture. For example, the following table shows the GDP for Japan as a percentage of that for the USA in 1985, 1990, 1993 and 1996. The PPP-converted data show a fairly steady relationship between the GDP for the two countries, which is to be expected given that the rates of growth in their GDP were not hugely different over these years. On the other hand, the exchange rate converted data show changes in the relationship of GDP between the two countries which are economically implausible. Even using a 5-year moving average of the exchange rates does not improve the plausibility of the relationship significantly.

Relationship of Japan's GDP to that of the USA (%)

	<u>1985</u>	<u>1990</u>	<u>1993</u>	<u>1996</u>
PPP-converted	36	40	41	41
Exchange rate converted	33	54	67	62
Exchange rate converted (5-year moving average)	39	59	65	61

Q: Should PPPs always be used rather than exchange rates in making international comparisons?

A: It would be a mistake to think of PPPs as a complete substitute for exchange rates in making international comparisons. In fact, they are complementary because PPP based comparisons are useful in specific situations, such as when comparing output levels or productivity levels between countries, while exchange rate based comparisons are more appropriate in others. For example, if an analyst wanted to work out how much could be imported with the proceeds from a particular level of exports then it would be necessary to use exchange rates rather than PPPs.

Q: Can PPPs at the level of GDP be used to determine whether a currency is undervalued or overvalued?

A: If the GDP PPP for a given country is higher or lower than the corresponding exchange rate, it indicates that the exchange rate understates or overstates the general price levels. This is not the same as saying a currency is undervalued or overvalued. Though PPPs appear in international trade theory in the context of equilibrium exchange rates - that is the underlying rates of exchange to which actual exchange rates are assumed to converge in the long term - the PPPs are not relevant for this purpose as they do not refer solely to domestically-produced tradeable goods and services valued at export prices. They have been calculated specifically in order to enable international price and volume comparisons to be made for GDP and its components. As such, they refer to the entire range of final goods and services which make up GDP as a whole, including many items which are not traded. Moreover, they are valued at domestic market prices and are calculated using expenditure weights that reflect domestic demand.

Q: How to read the MEI table - Comparative Price Levels ?

A: Monthly comparative price levels are defined as the ratios of PPPs for private final consumption expenditure to exchange rates. The monthly PPPs used to derive the table are OECD estimates. The table is to be read vertically. Each column shows the number of specified monetary units needed in each of the countries listed to buy the same representative basket of consumer goods and services. In each case the representative basket costs a hundred units in the country whose currency is specified.

Accuracy and reliability

Q: Who is responsible for the quality and the accuracy of the PPP results?

A: The accuracy of the PPP results depends both on the extent to which the OECD and Eurostat have used correct procedures for editing the data supplied by countries and for combining them to calculate parities at the different levels of aggregation and on the extent to which Member countries have supplied representative price data and accurate expenditure data. It is a shared responsibility and the shared nature of the Programme has been emphasised by the extensive consultations that take place at all stages of the work from the initial definitions of the goods and services to be priced up to the final review of each country's PPP results for basic headings. Experts from participating countries have also played a major role in the periodic reviews of technical issues that have been held in the past.

Q: In what situations would biases arise in PPPs?

A: There are two situations in which biases are known to arise in PPPs. The first is the "Gerschenkron effect" (see below) and the other is when a country reports prices that are not representative of its consumption patterns but classifies them as being "representative". Generally, prices which are "non-representative" tend to be higher than those which are "representative" of a country's consumption. Therefore, a country which reports non-representative prices but classifies them as "representative" will overstate its price levels and therefore understate its per capita volumes.

Q: What is the "Gerschenkron effect"?

A: The Gerschenkron effect can arise with aggregation methods that use either a reference price structure or a reference volume structure to compare countries. For methods employing a reference price structure, a country's share of total GDP (that is the total for the group of countries being compared) will rise as the reference price structure becomes less characteristic of its own price structure. For methods employing a reference volume structure, a country's share of total GDP will fall as the reference volume structure becomes less characteristic of its own volume structure. The Gerschenkron effect arises because of the negative correlation between prices and volumes. In other words, expenditure patterns change in response to changes in relative prices because consumers switch their expenditure towards relatively cheap products. The EKS method, which is the main method used by the OECD-Eurostat PPP Programme, does not use either a reference price structure or a reference volume structure when estimating real expenditures.



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