

AGGREGATING WORLD GDP – THE ROLE OF EXCHANGE RATES

The ECB, in line with the approach adopted by the IMF and other institutions, uses purchasing power parity (PPP) exchange rates to calculate both the relative size of individual economies and aggregate world GDP. At the end of last year the International Comparison Program, a project which covers 146 countries and is coordinated by the World Bank, released a revised set of PPP exchange rates benchmarked to the year 2005. This box discusses the impact of the new PPP rates on individual countries' contributions to world output and looks at the role of aggregation weights more generally, comparing PPP exchange rates with market exchange rates.

Revisions to PPP exchange rate estimates

The new estimates for PPP exchange rates entailed substantial changes in the shares of individual countries' contributions to global output, particularly in the case of emerging market countries (see Chart A). Most notably, the shares of China and India were reduced by approximately five and two percentage points respectively. This was offset mainly by increases of around two percentage points in the estimated shares of advanced economies such as the United States and the euro area (which rose to around 22% and 17% respectively).

The revised PPP exchange rates also have implications for aggregate world growth, resulting in a lower rate of growth for the world economy in recent years (a reduction of around half a percentage point per year on average since 2002, a result which is broadly in line with similar findings by the IMF). Using the new PPP exchange rates, the world economy is estimated to have grown by 4.7% in 2007, compared with 5.2% using the previous exchange rates. This is easily explained by the downward revision of the shares of fast-growing emerging economies such as China and India, which remain, nevertheless, the main drivers of world growth.

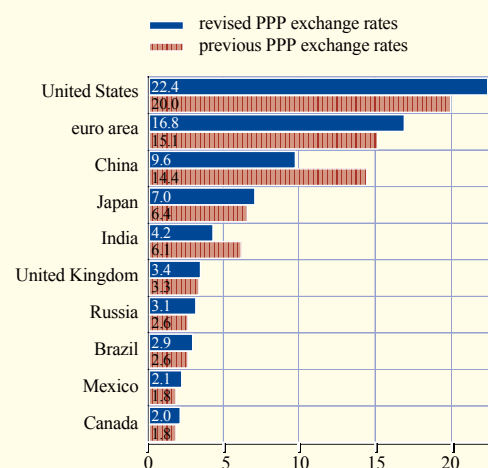
Comparison of world GDP under PPP and market exchange rates

The use of PPP exchange rates has the conceptual advantage of taking into account differences in national price levels when a region's share in world output is calculated. This is not the case for aggregation methods based on market exchange rates. Nevertheless, it is still useful to assess the sensitivity of aggregate world GDP to the type of exchange rate used in its calculation by comparing growth rates compiled using PPP and market exchange rates.

Chart B shows the ten largest economies in the world in 2005 under the new PPP exchange rates, compared with the shares of these economies using market exchange rates.

Chart A Shares in world GDP using PPP exchange rates

(percentages; 2005)

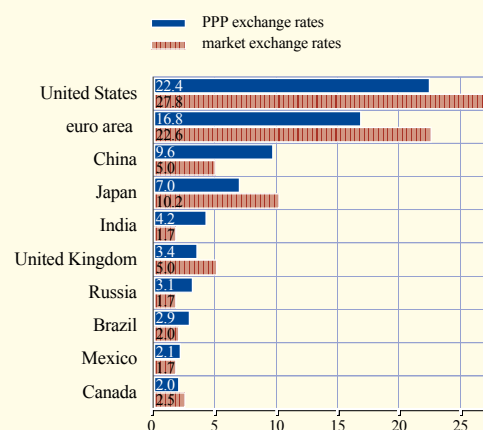


Sources: IMF and ECB staff calculations.

This confirms that the United States and the euro area are the largest economies, with a combined share of around 50% of world output under market exchange rates, compared with around 40% under PPP exchange rates. China is the third largest economy when measured using PPP exchange rates (having a share of almost 10% of world output), although it stands only in fifth position, after Japan and the United Kingdom, when measured using market exchange rates. More generally, it is apparent that the shares of advanced economies are typically larger under market exchange rates than under PPP rates, while the opposite is true for emerging economies.

Chart B Shares in world GDP using PPP and market exchange rates

(percentages; 2005)



Sources: IMF and ECB staff calculations.
Note: The chart shows the ten largest economies using PPP exchange rates.

This, together with substantial growth differentials across regions, implies that aggregate world growth is likely to vary significantly depending on the exchange rates employed in its calculation. Since 2000 world real GDP growth rates calculated using PPP exchange rates have consistently been above those obtained using market exchange rates, with an average difference of around 0.8 percentage point between the two. However, growth patterns using the two measures have been relatively similar, which confirms the findings published in Box 1 of the June 2006 Monthly Bulletin.