Purchasing power parity

- Two currencies are at parity if they can buy the same amount of "stuff" in their respective countries
- Example XR: $1.25/£. If the currencies are at parity (PPP) then
  - Something that costs $1.25 in US should cost £1.00 in UK
  - Something that costs $125 in US should cost £100 in UK
  - How much should something cost in the US if it costs £1,000 in UK?

Arbitrage opportunities tend to drive XR toward PPP

- Again, assume $1.25/£
- What if ball point pens cost $1.00 in US and £1.00 in UK? Arbitrage opportunity!
  - Buy pens in US, sell in UK
  - Buying causes US price to rise, e.g. to $1.15
  - Selling causes UK price to fall, e.g. to £0.95
  - Price ratio is now $1.15/£0.95 = 1.21, closer to $1.25/£ XR
  - Transportation costs will prevent convergence to 1.25

Using price levels to express PPP

- A key macroeconomic aggregate in each country is its "price level" (P), used to estimate price inflation. It is the price of a standard "basket" of goods and services.
- If PPP holds true, we should see the ratio of price levels should equal the XR
  - P_{US}/P_{UK} = \$/£ XR
  - If \$/£ XR > P_{US}/P_{UK}, we say the £ is overvalued relative to US\$
  - If \$/£ < P_{US}/P_{UK}, we say the £ is undervalued relative to US\$

Changes in XR if PPP holds true

- From the equation for absolute PPP (P_{US}/P_{UK} = \$/£) we can derive an equation for *changes* in XR that should come about due to *changes* in price level in two countries:
- $\%\Delta XR = \%\Delta P_{US} - \%\Delta P_{UK}$
- In words: the expected change in \$/£ XR equals the change in US price level minus change in UK price level. (% preferred over decimal)
- Example:
  - UK price level rises 5%
  - US price level rises 2%
  - XR should drop by 3% (2% - 5% = -3%)

PPP often fails to come about

- Some goods/services are not tradable
  - Haircuts
  - Bus rides
- Left-hand-drive automobiles
- Markets may be more competitive in one country than the other
- Taxes and tariffs may get in the way (VAT in Europe)

The Big Mac indicator of PPP

- Started by The Economist magazine as a semi-serious indicator of PPP
- Seems to work as well as more sophisticated measures
- Big Macs are sold all around the world and are all the same (sort of)
- If PPP holds true, a Big Mac should cost the same everywhere, after currency conversion

Over- or under-valuation of a currency according to the Big Mac theory

- Example: (Table 14.2) Hungary
  - XR is 245.69 Forint/$
  - Big Mac costs $4.20 in US (where?)
  - Big Mac should cost 4.20x245.69 = 1,031.89
  - Actual cost is 645 Forint
  - Forint is under-valued by (1031.89-645)/1031.89 = 37.5%
  - Stated differently: XR 245.69 > 645/4.20 price ratio

Over- or under-valuation of a currency according to the Big Mac theory

- Example: (Table 14.2) Mexico, should be close to PPP?
  - XR is 13.68 peso/$
  - Big Mac costs $4.20 in US (where?)
  - Big Mac should cost 4.20x13.68 = 57.45 pesos
  - Actual cost is 37 pesos
  - Peso is under-valued by (57.45-37)/57.45 = 35%
  - Stated differently: XR 13.68 > 37/4.20 price ratio

A Big Mac is a Big Mac is a Big Mac

- Or is it?
- Purchase of a Big Mac also entitles you to sit at a table
  - Real estate is very expensive in London relative to Kansas
- Other non-tradable costs may be higher in other countries
  - Labor, land, beef (somewhat), …