



# Lecture 4. Exchange rates

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# Purchasing Power Parity

- ❑ Purchasing power parity means that the price of similar goods is the same regardless of which currency one uses to buy the goods.
- ❑ Since goods or services in each country are priced in their own currency, it is difficult to make a clear comparison of the price of a given good or service in two different countries.
- ❑ Economists use Purchasing Power Parity (PPP) to measure how much a currency can buy relative to other currencies.
- ❑ The PPP method considers a bundle of goods, and then calculates the price of this bundle in each country, in each country's own currency.

# Purchasing Power Parity

- *Purchasing power parity ratio is the rate at which the currency of one country would have to be converted into that of another country to buy the same amount of goods and services in each country*
- The relative version of PPP is calculated as:

$$S = \frac{P_1}{P_2}$$

- Where:
  - "S" represents exchange rate of currency 1 to currency 2
  - "P<sub>1</sub>" represents the cost of good "x" in currency 1
  - "P<sub>2</sub>" represents the cost of good "x" in currency 2

# Purchasing Power Parity

A less formal approach used by the international news magazine The Economist:

- It measures one very standard item sold in many countries to calculate the PPP of various currencies. This item is the Big Mac hamburger(except in India, where it is substituted with the Maharaja Mac, a chicken sandwich) sold in McDonald's restaurants around the world.

# Purchasing Power Parity

The calculation of the Big Mac PPP- exchange rate looks at the price of a Big Mac in a given country and divides it by the price of a U.S. Big Mac.

Let's say that we are looking at the Big Mac in China. If a Chinese Big Mac is 12,5 yuan and the U.S. price is \$3,54, then - according to PPP - the exchange rate should be 3,53 yuan for US \$ 1. However, if the yuan was actually trading in the currency market at 6,84 yuan for US\$1, the Big Mac PPP would suggest that **the yuan is undervalued. This means that with the same amount of USD dollars you will be able to buy more goods and services in China than in USA.**

# Purchasing Power Parity

Country	Currency	Cost of BigMac	Purchasing Power Ratio	Exchange rate (Foreign currency per USD 1)	Domestic currency is
USA	\$	3,54			
Australia	A\$	3,45	0,97	1,57	Undervalued
Brazil	Real	8,02	2,27	2,32	Undervalued
Britain	£	2,29	0,65	0,69	Undervalued
China	Yuan	12,5	3,53	6,84	Undervalued
Euro	€	3,42	0,97	0,78	<b>Overvalued</b>
Hong Kong	HK \$	13,3	3,76	7,75	Undervalued
Japan	¥	290	81,92	89,8	Undervalued
Russia	Ruble	62	17,51	35,7	Undervalued
Sweden	SKR	38	10,73	8,3	<b>Overvalued</b>

# Currency: Depreciation vs Appreciation

- **Currency Depreciation:** A decline in the value of one currency relative to another currency.  
Depreciation occurs when a unit of one currency buys fewer units of another currency
- **Example:** Change in the exchange rate from 180 tenge per 1 dollar to 280 KZT per 1 USD means that tenge has been depreciated

# Currency: Depreciation vs Appreciation

- **Currency Appreciation:** An increase in the value of one currency with respect to another. This means that one unit of the appreciating currency buys more units of the other currency than it did previously.
- **Example:** Change in the exchange rate from 280 tenge per 1 dollar to 180 KZT per 1 USD means that tenge has been appreciated.



# Currency Exchange Rates

- **Direct rate** - the amount of domestic currency required to purchase one unit of a foreign currency (280 tenge per 1 US dollar)
- **Indirect rate** – the amount of foreign currency required to purchase one unit of a domestic currency (USD 0,0055 is required to buy 1 KZT, where  $0,0036 = 1 \text{ USD} / 280 \text{ KZT}$ )
- **Cross rate** of foreign currency 1 to foreign currency 2 =  
**Direct rate foreign currency 1 × Indirect rate foreign currency 2**  
 **$(\text{RUB } 0.23 / \text{KZT } 1) \times (\text{KZT } 280 / \text{USD } 1) = 64,4 \text{ RUB} / 1 \text{ USD}$  - cross rate**

# Forward rates vs Sport rates

- ▶ **Spot rates** – current exchange rates
- ▶ **Forward rates** – exchange rates in the future which depend to a larger extent on the current exchange rate and the expected inflation rates in two countries
- ▶ Forward rates are used to essentially minimize the risk of losses arising from having to convert money received in foreign currencies at lower rates.
- ▶ **Forward indirect rate<sub>t</sub> = current indirect rate ×  $\left(\frac{1+inf_f}{1+inf_h}\right)^t$**
- ▶ **Forward direct rate<sub>t</sub> = current direct rate ×  $\left(\frac{1+inf_h}{1+inf_f}\right)^t$**



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