



Parities

Outline

- Arbitrage with goods and investment
- Purchasing power parity
- Interest rate parity
- Summary

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Trade and investment

- ▶ Currencies are exchanged if goods are traded across borders
- ⇒ Such trade can be used to determine appropriate exchange rates
- ▶ Currencies are exchanged if investments are made abroad
- ⇒ Such investments can be used to determine appropriate exchange rates

Limits to the theories

- ▶ International trade and investment faces substantial transaction costs
- ▶ These transaction costs make foreign goods and investments not directly comparable
- ▶ This will limit the applicability of theories based on such approaches

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Equal goods prices

- ▶ If goods are produced in two countries and they can be traded, the costs of purchasing them should be the same in both countries
- ▶ If prices were different, arbitrage could occur with a trader buying the goods in the country with the lower price and selling it in the country with the higher price
- ▶ Of course, the price of the goods will be priced in different currencies and the exchange rate needs to be applied to transform the prices of the domestic country into that of the foreign country
- ▶ $P_t^* = e_t P_t$
- ▶ This is known as the absolute purchasing power parity

Relative purchasing power parity

- ▶ Price levels across an economy are often difficult to compare due to the variety of goods produced
 - ▶ We will instead compare inflation rates between countries
 - ▶ Absolute purchasing power parity holds: $P_t^* = eP_t$
- ⇒ $\ln P_t^* = \ln e_t + \ln P_t$
- ▶ The same holds for the previous time period: $\ln P_{t-1}^* = \ln e_{t-1} + \ln P_{t-1}$
- ⇒ $\ln e_t - \ln e_{t-1} = (\ln P_t^* - \ln P_{t-1}^*) - (\ln P_t - \ln P_{t-1})$
- ⇒ $\Delta e_t = \pi_t^* - \pi_t$

Exchange rates adjusting to inflation

- ▶ The change in the exchange rate should reflect the difference in inflation
- ▶ A country experiencing higher inflation would see its currency devalue over time
- ▶ Not all goods are traded, many services need to be provided locally, if these are included in inflation, the purchasing power parity might not hold

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Investing at home and abroad

- ▶ Investors can invest into bonds in their home country or into bonds denominated in a different currency
- ▶ Investing abroad involves exchanging their home currency for the foreign currency
- ▶ At the end of the investment, the investment is exchanged back into the domestic currency
- ▶ Investing abroad and overseas should yield the same outcome

Investment strategies



Exchange rates and interest rate differentials

- ▶ Domestic and foreign investments should have equal outcomes:

$$(1 + r_t) V_0 = \frac{e_0}{e_t} (1 + r_t^*) V_0$$

$$\Rightarrow \ln(1 + r_t) = \ln e_0 - \ln e_t + \ln(1 + r_t^*)$$

$$\Rightarrow r_t = -\Delta e_t + r_t^*$$

$$\Rightarrow \Delta e_t = r_t^* - r_t$$

Exchange rates adjusting to interest rate differentials

- ▶ Exchange rates reflect the difference in interest rates of the countries
- ▶ The exchange rate of the country with the higher interest rate should depreciate over time
- ▶ This result holds for the length to maturity of the bonds affected and could be used to forecast future exchange rate movements over long periods of times
- ▶ The interest rate parity implies that both investment have the same risk, but this can be adjusted to account for any differences in risk

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International Fisher effect

- ▶ Exchange rates will take into account price changes in tradeable goods and different yields to investments in countries
- ▶ Purchasing power parity and interest rate parity should both hold
- ▶ $\Delta e_t = \pi_t^* - \pi_t = r_t^* - r_t$
- ⇒ $r_t - \pi_t = r_t^* - \pi_t^*$
- ▶ The real interest rates across countries have to equal

Limits in the use of parities

- ▶ Information on inflation is only available with substantial delays, making the forming of expectations necessary
- ▶ Interest rates are affected by monetary policy decisions and these are linked to macroeconomic factors, including inflation
- ▶ Such interdependencies, lack of information and monetary policy interventions limits the applicability of parities



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