FINANCIAL MARKETS AND INSTITUTIONS

FOREIGN EXCHANGE MARKET

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DEAMS
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AGENDA

- Purpose, features and economic role of exchange rates
- Theories of exchange rates:
  - long run: purchasing power parity
  - short term
- ER and IR
- The interest parity condition

PURPOSE AND FEATURES

- Trading currencies and deposits in particular currencies
- Price/quantity determine exchange rates and costs of purchasing foreign goods, services and financial assets
- Trading occurs on three markets:
  - spot: immediate exchange of funds, determining spot ER
  - forward/future: future exch. of funds, determining future ER
  - swaps: exchange of two currencies across parties

PURPOSE AND FEATURES

- Appreciation (increase in one currency's value) Vs. Depreciation:
  - Usually quotes are in units of domestic per foreign currency: appreciation represents a fall in this exchange rate (f.i. in EU, from 0.75 €/$ to 0.7 €/$)
  - For illustrative purposes, the opposite occurs: units of foreign per domestic currency: appreciation represents an increase in this exchange rate (f.i. in EU, from 1.33 $/€ to 1.43 $/€)

PURPOSE AND FEATURES

- Currency's value changes affect economy:
  - appreciation makes own goods more expensive and foreign good cheaper if prices are constant (depreciation the opposite)
  - economic and financial integration makes this relevant for the overall economy, not just for importers/exporters
  - ER are linked with IR through returns on assets
- Trading is OTC between several dealers, despite exchanges list market ER and commentators use words such as Forex/FX
- Trading rarely involves currencies themselves, more often dealing with large (mln $-€) deposits denominated in different currencies
- Currently the world's biggest financial market, with trillions of € equivalents traded every day, only considering wholesale operations
- Extremely liquid and deep worldwide market

THEORIES OF ER: LONG RUN

Theory of purchasing power parity (PPP)

- Law of one price: two countries producing the same good with negligible transportation costs and trade barriers should price them at the same level
- ER between two currencies change to reflect changes in price levels of the two related countries
- If price levels rise in one country, its currency depreciates and others appreciate
- Real ER (rate of exchange between national and foreign goods) are representative of currency's relative cheapness or expensiveness, therefore PPP predicts RER close to 1 across all currencies
- PPP works in the long run due to its strong hypothesis: goods are perfect substitutes, all goods can be traded internationally and transportation/trade barriers are negligible

THEORIES OF ER: LONG RUN

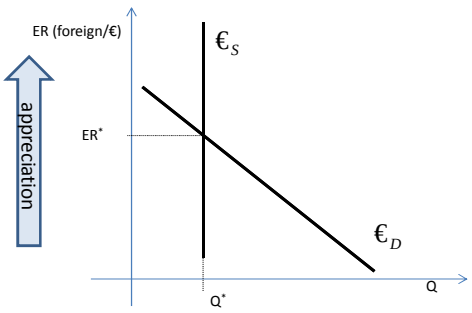
Factors affecting ER in the long run are those influencing the demand for national VS foreign traded goods:

- Relative price levels: rising domestic inflation depreciates national currency
- Trade barriers: increasing trade barriers (tariffs/quotas) appreciates national currency
- Demand's preferences: increasing appetite for domestic goods appreciates national currency
- Productivity: greater productivity in internationally traded goods reduce their relative price and appreciates national currency

THEORIES OF ER: SHORT RUN

Supply and demand framework, applied on stocks of assets in national and foreign currencies (instead of import/export flows):

- Supply (domestic assets) can be considered fixed towards short run ER
- Demand decreases as currency appreciates (keeping future expected ER constant), since lower current ER with constant expected future ER means higher returns on national assets



THEORIES OF ER: SHORT RUN

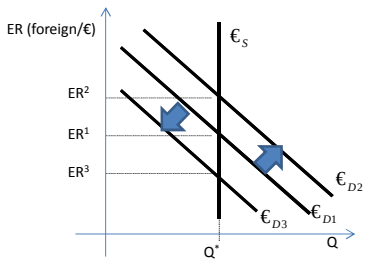
Factors influencing demand:

- IR: if national assets provide greater returns compared to foreign ones, demand increases and ER appreciate; if foreign assets provide greater returns compared to national ones, demand decreases and ER depreciates
- Expected future ER: if the future expected ER increases (because of expected lower national price levels, higher trade barriers, lower foreign import, higher national export, higher national productivity), returns on national assets increase, demand increases and ER appreciate

THEORIES OF ER: SHORT RUN

Examples

Left D shifts:
- – national IR
- + foreign IR
- + domestic prices
- – trade barriers
- + import demand
- – export demand
- – productivity

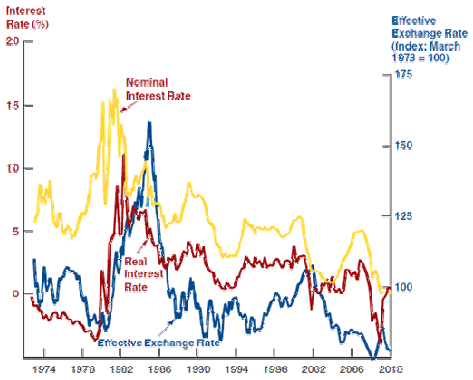


Right D shifts:
- + national IR
- – foreign IR
- – domestic prices
- + trade barriers
- – import demand
- + export demand
- + productivity

IR AND ER

IR and ER:

- IR can change because of real IR or expected inflation changes with different effects on ER
- only if real IR increase, returns increase as well as demand of national assets, leading to currency's appreciation
- if nominal IR increase because of expected inflation, returns decrease (less goods will be purchased in the future for the same amount of currency) as well as demand of national assets, leading to currency's depreciation



THE INTEREST PARITY CONDITION

- Frequently used relationship between IR and ER
- If domestic assets earn i^D and foreign assets i^F (no capital gains), comparison of earnings requires currency conversion
- Returns in terms of foreign currency should consider expectations over future appreciation/depreciation of domestic currency (where *E* is the usual foreign Vs. domestic ER) :

$$R^D(F) = i^D + \frac{E^e_{t+1} - E_t}{E_t} \quad \text{proxy of} \quad R^D(F) = i^D \cdot \frac{E^e_{t+1}}{E_t} + \frac{E^e_{t+1} - E_t}{E_t} \quad \text{for} \quad \frac{E^e_{t+1}}{E_t} \approx 1$$

- Relative returns in terms of foreign currency, i.e. the difference between domestic and foreign returns, are:

$$\text{Relative } R^D(F) = i^D - i^F + \frac{E^e_{t+1} - E_t}{E_t}$$

- Returns in terms of domestic currency and relative returns in terms of domestic currency, are straightforward:

$$R^F(D) = i^F - \frac{E^e_{t+1} - E_t}{E_t} \rightarrow \text{Rel. } R^F(D) = i^D - \left(i^F - \frac{E^e_{t+1} - E_t}{E_t} \right) = i^D - i^F + \frac{E^e_{t+1} - E_t}{E_t} = \text{Rel. } R^D(F)$$

THE INTEREST PARITY CONDITION

- If, due to capital mobility, assets (domestic and foreign) are perfect substitutes, increase in expected domestic or foreign returns lead to an increase in demand of those assets and a decrease in others
- For a rigid amount of domestic and foreign assets, expected returns should be equal (interest parity condition, equilibrium) or, in other terms, domestic IR equal foreign IR plus expected appreciation of foreign currency:

$$i^D = i^F - \frac{E^e_{t+1} - E_t}{E_t}$$

- Also, focusing on E_t, this condition explains changes in demand of domestic and foreign assets:

$$E_t = \frac{E^e_{t+1}}{i^F - i^D + 1}$$

Domestic currency appreciates ($\Delta^+ E_t$) if:
- expected future appreciation
- increase in domestic IR
- decrease in foreign IR

EXAMPLES

1. On 1st February 2013 the ER was 1.3644 $/€. If on 1st April the € depreciated by 6%, what was the new ER? What in terms of €/$?
2. IR in Europe are 4% and in the US are 2.5%. Due to the interest parity condition, what is expected to happen to the rate of appreciation of the foreign currency (US)?

1. $1.3644 \cdot (1 - 6\%) = 1.2825$

   $1/1.3644 = 0.7329 \quad 1/1.2825 = 0.7797 \quad (0.7797 - 0.7329)/0.7329 = 6.38\%$

2. $i^D = i^F - \frac{E^e_{t+1} - E_t}{E_t} \rightarrow -\frac{E^e_{t+1} - E_t}{E_t} = 4\% - 2.5\% = 1.5\%$

EXAMPLES

3. What happened to € and $ during the financial crisis (2007-2008)?
   Why is the Euro so "strong" despite the EU-crisis in 2011? Why is it weaker now?

EXAMPLES

- What happened to € and $ during the financial crisis?
  - Due to the localised US financial crises, the FED cut interest rates sharply whereas the ECB kept them stable to protect against oil prices and inflation: € appreciated over $
  - Contagion from US to European banks, the ECB cut interest rates to its all-time low: appreciation slowed
  - Flight to quality: US Treasuries became a safe-heaven for investors, increasing the demand for $ and leading to a recovery against €

EXAMPLES

- Why is the Euro so "strong" despite the EU-crisis in 2011?
  - The FED and the ECB have different mandates and powers (we'll see), making harder for Europe to influence sharply ER with monetary policy so tight
  - EU is a strong economy and more stable if compared to others, in terms of import/export, public finances, private indebtedness (relative), higher IR and lower extraordinary liquidity measures
  - Diversification of emerging countries in currencies other than $
  - Paradoxically, the bigger the chance of a EU breakup, the stronger the €…
- Why is the € weaker now?
  - Mainly due to differences in economic recovery and CB's intervention

EXAMPLES

4. Foreign ER and IR can provide interesting investing opportunities and their differences convey a number of trading strategies. The most common is carry-trade.

   1y IR in JPY are 0.2%, whereas in EUR are 2.5%; the investor has only 20,000 € available but is allowed to raise other 80,000 € (1:5 leverage).

   What is the result of a basic carry-trade with stable ER at 133.26 yen/€ (current)?

   What if the ER moved from 133.26 to 115 (similar to 2009-2010)?

Long: $100{,}000 \cdot (1 + 2.5\%) = 102{,}500€$

Short: $100{,}000 \cdot 133.26 \cdot (1 + 0.2\%) = 13{,}352{,}652Y \rightarrow 13{,}352{,}652 / 133.26 = 100{,}200€$

Net result: $102{,}500 - 100{,}200 = 2{,}300€ \rightarrow 2{,}300 / 20{,}000 = 11.5\% = (2.5\% - 0.2\%) \cdot 5$

Income: $100{,}000 \cdot (1 + 2.5\%) = 102{,}500€$

Costs: $100{,}000 \cdot 133.26 \cdot (1 + 0.2\%) = 13{,}352{,}652Y \rightarrow 13{,}352{,}652 / 115 = 116{,}110€$

Net result: $102{,}500 - 116{,}110 = -13{,}610€ \rightarrow -13{,}610 / 20{,}000 = -68\%$