

## Chapter 17 : Foreign Exchange Market

### 1. Foreign Exchange Market

- Exchange rate: the price of one currency in terms of another.
- We will be using the notation  $E_t = \frac{\text{euro}}{\text{dollar}}$ , how many euros are needed to buy one US dollar (value of the dollar)
- $E_t \uparrow \Rightarrow$  need more euros to buy a dollar, dollar **appreciates** (rises in value relative to euro) and euro **depreciates**.
- **Spot exchange rate**: for spot transactions, which involve the immediate (two-day) exchange of bank deposits.
- **Forward exchange rate**: for forward transactions, which involve the exchange of bank deposits at some specified future date.

### 2. Law of one price

- Assumptions:
  - (a) No transportation cost and trade barrier
  - (b) Identical tradable goods
- Results : Goods in every places should have the same prices (If not?)

### 3. Purchasing Power Parity (Long Run)

- Starting point: Law of One Price (LOP)
- **PPP**: exchange rate adjusts to reflect changes in the price levels of the two countries. Assume goods are identical; transaction cost are low; trade barriers are low. If foreign country price level increases (relative to another), then its currency depreciates (relative to the other country's currency).

$$\frac{1}{P_{US}} = \frac{E_t}{P_{EU}} \text{ or } P_{EU} = E_t \times P_{US}$$

- Problems with PPP:
  - (a) All goods are not identical in different countries so their prices needn't be equal.
  - (b) Not all goods are traded so the increase in non-traded goods and services may rise the price level of one country relative to the other without affecting the exchange rate.

- If a factor increases the demand for domestic goods relative to foreign goods, the domestic currency will appreciate:
  - (a) Domestic price level ↓:  $P_{US} \downarrow \Rightarrow D_{US} \uparrow \Rightarrow E \uparrow$ , \$ appreciates because US goods will continue to sell well even with a higher value of the dollar.
  - (b) Trade barriers (tariffs and quotas) ↑: Trade barrier ↑  $\Rightarrow D_H \uparrow \Rightarrow E \uparrow$
  - (c) Import demand ↓:  $D_F \downarrow \Rightarrow D_H \uparrow \Rightarrow E \uparrow$
  - (d) Export demand ↑:  $D_H \uparrow \Rightarrow E \uparrow$
  - (e) Productivity ↑: productivity in traded goods ↑  $\Rightarrow$  Cost of Production ↓  $\Rightarrow P_H \downarrow \Rightarrow D_H \uparrow \Rightarrow E \uparrow$

#### 4. Exchange rate in the short run (A supply and demand analysis)

##### (a) Demand and supply of domestic assets

$$\text{Relative } R^D = i^D - i^F + \frac{E_{t+1}^e - E_t}{E_t}$$

- i. Demand for domestic assets: relative expected return
  - The lower current E, the greater the expected appreciation of the dollar, the greater the expected return on dollar assets relative to foreign assets, the higher the quantity demanded of dollar assets (downward sloping demand curve).
- ii. The demand curve shifts to the right when:
  - Domestic interest rate ↑
  - Foreign interest rate ↓
  - Expected future Exchange rate ( $E_{t+1}^e \uparrow$ ) which can occur because of any of the 5 factors in (3, d).
- iii. Supply Curve:
  - Consists of the amount of bank deposits, bonds and equities. Considered fixed, independent of the exchange rates. It is a vertical line on the quantity of dollar assets axis and parallel to the  $E_t$  axis.

(b) **Interest parity condition (IPC):**

$$i^D = i^F - \frac{E_{t+1}^e - E_t}{E_t}$$

- i. Domestic interest rate equals the foreign interest rate minus the expected appreciation of the domestic currency, or, domestic interest rate equals foreign interest rate plus the expected depreciation of the foreign currency. If the domestic interest rate is higher than the foreign interest rate, one expects a positive expected appreciation of the foreign currency which compensates for the lower foreign interest rate.
- ii. Interest rate parity condition implies that the expected returns on both dollar assets and foreign assets are the same.
- iii. We can rewrite the interest parity condition as  $E_t = \frac{E_{t+1}^e}{i^F - i^D + 1}$   
This will explain the relationship between exchange rate and the three factors that affect the demand of domestic assets.

## 5. Applications

(a) Changes in interest rates:

- i. Recall Fisher Equation:  $i = i_r + \pi^e$
- ii. An increase in the domestic real interest rate,  $i_r \uparrow$   
$$i_r \uparrow \Rightarrow i^D \uparrow \Rightarrow E \uparrow$$
  - When  $i^D \uparrow$  because **domestic real interest rate** increases, the domestic currency **appreciates**, assuming  $\pi^e$  constant.
- iii. An increase in the expected inflation
  - Fisher equation :  $\pi^e \uparrow \Rightarrow i^D \uparrow \Rightarrow E \uparrow$
  - PPP :  $\pi^e \uparrow \Rightarrow E_{t+1}^e \downarrow$
  - Overall effect is  $\text{Relative } R^D \downarrow \Rightarrow D$  shifts to the left
  - When  $i^D \uparrow$  due to **an increase in expected inflation**, the domestic currency **depreciates**.

(b) Changes in the money supply: **exchange rate overshooting**

- i. In the short run,  $P$  is fixed
  - $M \uparrow \Rightarrow \pi_t^e \uparrow \Rightarrow D$  shifts to the left  $\Rightarrow E_{t+1}^e \downarrow$
  - $M \uparrow \Rightarrow \frac{M}{P} \uparrow \Rightarrow i^D \downarrow \Rightarrow D$  shifts to the left  $\Rightarrow E_{t+1}^e \downarrow$
- ii. In the long run,
  - $P$  adjusts until  $\frac{M}{P}$  is constant in the long run  $\Rightarrow D$  shifts to the right, but not the original level in the long run.

## Practice questions

**[Q1]** When the exchange rate for the British pound changes from \$1.80 per pound to \$1.60 per pound, then, holding everything else constant, the pound has \_\_\_\_\_ and \_\_\_\_\_ expensive.

- A) appreciated; British cars sold in the United States become more
- B) appreciated; British cars sold in the United States become less
- C) depreciated; American wheat sold in Britain becomes more
- D) depreciated; American wheat sold in Britain becomes less

**[Q2]** If the 2005 inflation rate in Canada is 4 percent, and the inflation rate in Mexico is 2 percent, then the theory of purchasing power parity predicts that, during 2005, the value of the Canadian dollar in terms of Mexican pesos will

- A) rise by 6 percent.
- B) rise by 2 percent.
- C) fall by 6 percent.
- D) fall by 2 percent.

**[Q3]** If the interest rate is 7 percent on euro-denominated assets and 5 percent on dollar-denominated assets, and if the dollar is expected to appreciate at a 4 percent rate, for Francois the Frenchman the expected rate of return on dollar-denominated assets is

- A) 11 percent.
- B) 9 percent.
- C) 5 percent.
- D) 3 percent.
- E) 1 percent.

**[Q4]** In a world with few impediments to capital mobility, the domestic interest rate equals the sum of the foreign interest rate and the expected depreciation of the domestic currency, a situation known as the

- A) interest parity condition.
- B) purchasing power parity condition.
- C) exchange rate parity condition.
- D) foreign asset parity condition.

**[Q5]** (Fall 2010) If the dollar appreciates from 1.5 Brazilian reals per dollar to 2.0 reals per dollar, the real depreciates from \_\_\_\_\_ per real to \_\_\_\_\_ per real.

- A) \$0.67; \$0.50
- B) \$0.33; \$0.50
- C) \$0.50; \$0.67
- D) \$0.75; \$0.50
- E) \$0.50; \$0.75

**[Q6]** (Fall 2010) \_\_\_\_\_ in the foreign interest rate causes the demand for domestic assets to increase and the domestic currency to \_\_\_\_\_, everything else held constant.

- A) An increase; depreciate
- B) A decrease; appreciate
- C) An increase; appreciate
- D) A decrease; depreciate

**[Q7]** (Fall 2010) The starting point for understanding how exchange rates are determined is a simple idea called \_\_\_\_\_, which states: if two countries produce an identical good, the price of the good should be the same throughout the world no matter which country produces it.

- A) Gresham's law
- B) purchasing power parity
- C) arbitrage
- D) the law of one price

**[Q8]** (Fall 2010) Anything that increases the demand for foreign goods relative to domestic goods tends to \_\_\_\_\_ the domestic currency because domestic goods will only continue to sell well if the value of the domestic currency is \_\_\_\_\_, everything else held constant.

- A) depreciate; higher
- B) depreciate; lower
- C) appreciate; higher
- D) appreciate; lower