

## ***THE OPEN ECONOMY***

### **1. International Flows of Capital and Goods**

#### *(1) The Role of Net Exports*

- $Y = C^d + I^d + G^d + EX$   
= domestic spending + foreign spending

where  $C^d$  : consumption of domestic goods and services

$I^d$  : investment in domestic goods and services

$G^d$  : gov't purchase of domestic goods and services

$EX$  : exports of domestic goods and services

- $Y = (C - C^f) + (I - I^f) + (G - G^f) + EX$   
=  $C + I + G + EX - (C^f + I^f + G^f)$   
=  $C + I + G + EX - IM = C + I + G + NX$

where  $IM$  : the sum of domestic spending on foreign good and services

$NX$  : net exports

- $NX = Y - (C + I + G)$   
= output – domestic spending

→ In an open economy, domestic spending need not equal the output of goods and services.

***If output > domestic spending → net exports > 0***

***If output < domestic spending → net exports < 0***

## *(2) Net Foreign Investment (Net Capital Outflow) and the Trade Balance*

- $Y = (C + I + G) + NX$   
→  $Y - C - G = S = I + NX$   
→  $S - I = NX$   
→ An economy's net exports (*trade balance*) must always equal to the difference b/t its saving and its investment (*net foreign investment or net capital outflow*)

If  $S - I = NX > 0$  → trade surplus

If  $S - I = NX < 0$  → trade deficit

If  $S - I = NX = 0$  → balanced trade

- The national income accounts identity shows the international flow of funds to finance capital accumulation and the international flow of goods and services are two sides of the same coin.

## 2. Saving and Investment in a Small Open Economy

- In a closed economy, real interest rate adjust to equilibrate saving and investment

But in an open economy, the real interest rate doesn't.

→ allow the economy to run a trade surplus (deficit)

- What does determine the real interest rate?

Assuming a small open economy with perfect capital mobility, the interest rate must equal to the world interest rate, .

Note: world interest rate is an exogenous given variable (b/c a small economy has a negligible effect on world saving and world investment)

### (1) Model

- Assumptions:

- $Y = \bar{Y} = F(\bar{K}, \bar{L})$

- $C = C(Y - T)$

- $I = I(r^*)$

- Trade balance is determined by the difference b/t saving and investment at the world interest rate (fig. 5-2)

→  $NX = S - I = (\bar{Y} - C(\bar{Y} - T) - G) - I(r^*)$

## (2) *How Policies Influence the Trade Balance*

- Assumption: a position of balanced trade ( $NX = 0$ )

(a) Fiscal policy at home (fig. 5-3)

$$G \uparrow (\text{or } T \downarrow) \rightarrow S \downarrow \rightarrow NX \downarrow$$

→ Starting from balance trade, a change in fiscal policy that reduces national saving leads to a trade deficit

(b) Fiscal policy abroad (fig. 5-4)

If the foreign countries are a large part of the world economy,

$$G^* \uparrow (\text{or } T^* \downarrow) \rightarrow S^* \downarrow \rightarrow r^* \uparrow \rightarrow NX \uparrow$$

→ Starting from balance trade, an increase in the world interest rate due to a fiscal policy expansion leads to a trade surplus

(c) Shifts in investment demand (fig. 5-5)

e.g., investment tax credit

$$I \uparrow \rightarrow NX \downarrow$$

→ Starting from balance trade, an outward shift in the investment schedule causes a trade deficit

### 3. Exchange Rates

#### (1) *Nominal and Real Exchange Rates*

- Nominal exchange rate: the relative price of the currency of two countries  
e.g., the exchange rate b/t the US dollar and the Japanese Yen is 120 yen per dollar
- Real exchange rate: the relative price of the goods of two countries (= terms of trade)  
e.g., American pizza: \$1 (=120yen),  
Japanese pizza: 240yen.

$$\begin{aligned}\text{Real Exchange Rate} &= \frac{(120 \text{ yen}/\$) \times (\$1/\text{American pizza})}{240 \text{ yen}/\text{Japanese pizza}} \\ &= 0.5 \times \frac{\text{Japanese pizza}}{\text{American pizza}}\end{aligned}$$

→ American pizza costs one-half of what Japanese pizza costs

$$\text{Real EXRA}(\varepsilon) = \text{Nominal EXRA}(e) \times \text{Ratio of price level}(P / P^*)$$

→ If  $\varepsilon$  is high (low), foreign goods are relatively cheap (expensive), and domestic goods are relatively expensive (cheap)

## (2) *The Determinants of the Real Exchange Rate*

### (a) The real EXRA and the trade balance (fig. 8-7)

The lower  $\varepsilon$ , the less expensive are domestic goods relative to foreign goods.

→ the greater are our net exports

→  $NX = NX(\varepsilon)$

### (b) trade balance( $NX$ ) = net foreign investment ( $S - I$ )

From (a) and (b),

“At the equilibrium real exchange rate, The supply of dollars available for net foreign investment balances the demand for dollars by foreigners buying our net exports” (fig. 5-8)

## (3) *How Policies Influence the Real Exchange Rate*

### (a) Fiscal policy at home (fig. 5-9)

### (b) Fiscal policy abroad (fig. 5-10)

### (c) Shifts in investment demand (fig. 5-11)

### (d) The effects of trade policies (fig. 5-12)

e.g., The impact of protectionist trade policies

→ raise the demand for net exports

→ raise the exchange rate

(4) *The Determinants of the Nominal Exchange Rate*

$$\text{Real EXRA}(\varepsilon) = \text{Nominal EXRA}(e) \times \text{Ratio of price level}(P / P^*)$$



$$\text{Nominal EXRA}(e) = \text{Real EXRA}(\varepsilon) \times \text{Ratio of price level}(P^* / P)$$

(a) Given  $\varepsilon$ , if the domestic price level ( $P$ ) $\uparrow \rightarrow e \downarrow$

That is, b/c a dollar is worth less, a dollar will buy fewer yen

(b) Given  $\varepsilon$ , if the foreign price level ( $P^*$ ) $\uparrow \rightarrow e \uparrow$

That is, b/c the yen is worth less, a dollar will buy more yen

- Inflation and Nominal EXRA

$$e = \varepsilon \times (P^* / P)$$

$$\begin{aligned} \rightarrow \% \Delta e &= \% \Delta \varepsilon + \% \Delta P^* - \% \Delta P \\ &= \% \Delta \varepsilon + (\pi^* - \pi) \end{aligned}$$

“If a country has a high (low) rate of inflation relative to the US, a dollar will buy an increasing (decreasing) amount of the foreign currency overtime” (fig. 5-13)