

## Open Economy Macroeconomics: International Trade in Goods and Assets

---

---

---

---

---

---

---

---

## Goals

- Why do economists believe in free trade?
- Has NAFTA cost US jobs?

---

---

---

---

---

---

---

---

## Model 1: A Two-Good Model of a Small Economy

- Definition: A Small country is one in which the actions of the representative firm and consumer in the economy have no effect on world prices.
- This economy can produce and consume two goods- a and b

---

---

---

---

---

---

---

---

- Definition: The terms of trade is the price of good a in terms of the price of good b,  $TOT_{a,b} = p_a/p_b$ .
- Definition: The terms of trade is the real exchange rate
- We will determine when country a imports good a and when the country exports good a.

---

---

---

---

---

---

---

---

## Technology

- Definition: The production possibilities frontier describes the combinations of good a and good b the country can produce.
- The slope of the PPF curve is minus the MRT (the quantity of good b that must be given up to get a unit of good b)

---

---

---

---

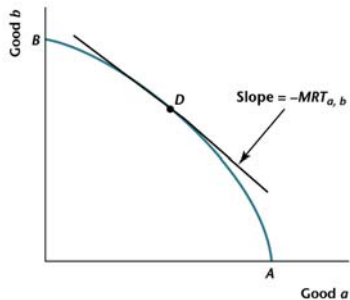
---

---

---

---

**Figure 13.1** Production Possibilities Frontier for the SOE




---

---

---

---

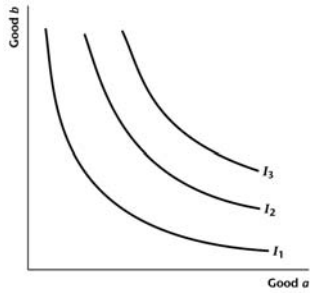
---

---

---

---

**Figure 13.2** Indifference Curves of the Representative Consumer in the SOE



---

---

---

---

---

---

---

---

## Equilibrium

- The no trade equilibrium (autarky) occurs where the PPF and indifference curve is tangent.
- Consumer Condition:  
$$MRS_{a,b} = p_{a,b}$$
- Firm Condition:  
$$p_{a,b} = MRT_{a,b}$$

---

---

---

---

---

---

---

---

- Overall Condition  
$$MRS_{a,b} = p_{a,b} = MRT_{a,b}$$

---

---

---

---

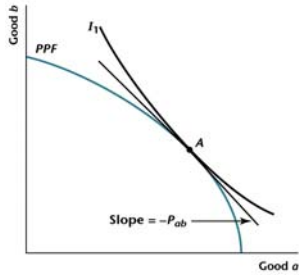
---

---

---

---

### Figure 13.3 Equilibrium in the SOE with No Trade




---

---

---

---

---

---

---

---

### Equilibrium with Trade

- Consumers and Firms now can trade at the  $TOT_{a,b}$ .
- Firms produce at
 
$$MRT_{a,b} = TOT_{a,b}$$
- Consumers choose
 
$$MRS_{a,b} = TOT_{a,b}$$

---

---

---

---

---

---

---

---

### Review of consumers choice

- $\max u(q_a, q_b)$  subject to
 
$$p_a q_a + p_b q_b = p_a a + p_b b$$
 or
 
$$(p_a/p_b) q_a + (p_b/p_b) q_b = (p_a/p_b) a + (p_b/p_b) b$$
 or
 
$$(TOT_{ab}) q_a + q_b = (TOT_{ab}) a + b$$
 So the slope is  $-TOT_{ab}$

---

---

---

---

---

---

---

---

## Preferences of the Consumer

- Consumers preferences are represented in indifference curves.

---

---

---

---

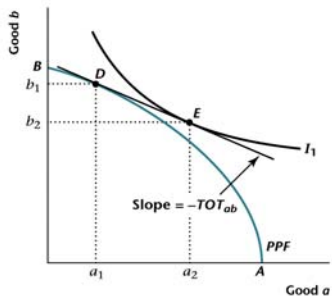
---

---

---

---

### Figure 13.4 Production and Consumption in the SOE with Trade



---

---

---

---

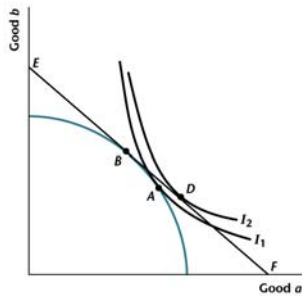
---

---

---

---

### Figure 13.5 An Increase in Welfare When Good a Is Imported



---

---

---

---

---

---

---

---

## Summary

- Firms produce at point D
- Households consume at point E
- Because the consumer is able to reach a higher indifference curve, welfare is enhanced.
- What happens if we have different types of firms and consumers?

---

---

---

---

---

---

---

---

## What does this model tell us about trade?

- Good a is imported and Good b is exported.
- What is the current account position?  
Now we have to compare the value of imports and exports.

$$\begin{aligned} \text{CA} &= \text{value of exports} - \text{value of imports} \\ &= (b - q_b) - (\text{TOT}_{ab})(q_a - a) \end{aligned}$$

---

---

---

---

---

---

---

---

- Because good b is exported, this country has a comparative advantage in good b.

---

---

---

---

---

---

---

---

### In this model, the CA = 0. Why?

$$CA = (b - q_b) - (TOT_{ab})(q_a - a)$$

Use the consumer's budget constraint to determine  $b$ , and substitute into the CA definition.

$$CA = ((TOT_{ab})q_a + q_b - (TOT_{ab})a) - q_b - (TOT_{ab})(q_a - a) = 0$$

---

---

---

---

---

---

---

---

### What happens if the TOT change?

- Suppose the price of the import good, good  $a$ , increases. Then,  $TOT_{a,b}$  increases which means the terms of trade deteriorate.
- The slope of the TOT curve becomes steeper.

---

---

---

---

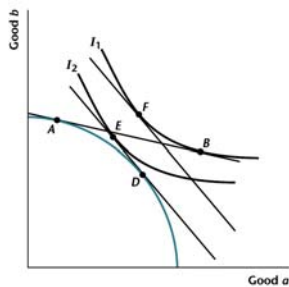
---

---

---

---

**Figure 13.7** An Increase in the Terms of Trade when Good  $a$  Is Initially Imported



---

---

---

---

---

---

---

---

- The production of a increases and b decreases.
- You consume less of good a and maybe good b.(why?)
- You export good a and import good b.
- The change in the TOT has changed the comparative advantage.
- The consumer is worse off after the TOT change.

---

---

---

---

---

---

---

---

### Changes in the TOT of trade do not always make you worse off.

- If good b is imported and good a exported, and increase in the TOT increases welfare.

---

---

---

---

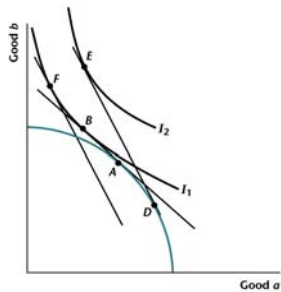
---

---

---

---

**Figure 13.8** An Increase in the Terms of Trade when Good b Is Initially Imported




---

---

---

---

---

---

---

---

## Model 2: A Two-Period Open-Economy Model

- If you want to understand why we have that a current account deficit, we need a two period framework.
- Borrowing and lending are an important part of the explanation.

---

---

---

---

---

---

---

---

## Consumer's problem

- Max  $u(C_1, C_2)$

Subject to

$$C_1 + C_2/(1+r) = (Y_1 - T_1) + (Y_2 - T_2)/(1+r)$$

---

---

---

---

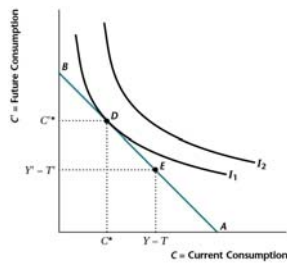
---

---

---

---

## Figure 13.9 The Two-Period Small Open-Economy Model



---

---

---

---

---

---

---

---

- Since period 1 after-tax endowment exceeds consumption, this consumer is saving.
- $S^p = Y_1 - T_1 - C_1$

---

---

---

---

---

---

---

---

## The Government

- The budget constraint is:  

$$G_1 + G_2/(1+r) = T_1 + T_2/(1+r)$$
- Government saving is:  

$$S^g = T_1 - G_1$$

---

---

---

---

---

---

---

---

## The Current Account

- $CA = S - I$
- No investment
- $CA = S = S^p + S^g$   

$$= (Y_1 - T_1 - C_1) + (T_1 - G_1)$$
  

$$= Y_1 - C_1 - G_1$$

---

---

---

---

---

---

---

---

## What factors can affect the current account?

- Increase in  $Y_1$
- Increase in  $G_1$
- Increase in Taxes
- Increase in the real interest rate

---

---

---

---

---

---

---

---

## Suppose we increase G and cut Taxes. What will happen?

- Reagan did this in the 1980's and G.W.Bush has done this recently.

---

---

---

---

---

---

---

---

## Figure 13.11 Government Spending and Taxes



---

---

---

---

---

---

---

---

## What does the model predict?

- Net exports should fall.
- In other words, the current account should become less positive (more negative)
- This is called the Twin Deficits!

---

---

---

---

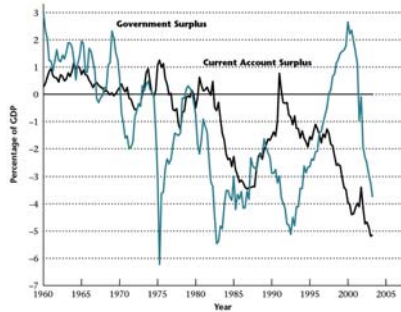
---

---

---

---

### Figure 13.12 The Twin Deficits



---

---

---

---

---

---

---

---

## Does a fiscal deficit always mean a current account deficit?

- Yes, if investment is zero.
- Not necessarily if investment is positive.

$$CA = S + I$$

If S falls because of an increase in the government deficit and I fall by the same amount, the CA need not change.

---

---

---

---

---

---

---

---

### Model 3: An Expanded Real Intertemporal Model

- A Small Economy Framework which means the economy faces a given real interest rate.
- Production and Investment is determined by Firms

---

---

---

---

---

---

---

---

### Determination of Equilibrium Output

---

---

---

---

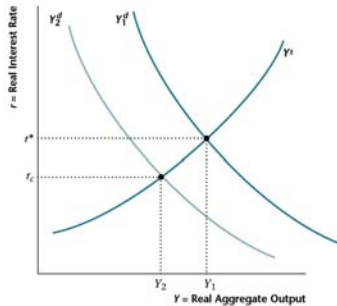
---

---

---

---

**Figure 13.13** A Small Open-Economy Model with Production and Investment



---

---

---

---

---

---

---

---

## What do we learn?

- In a world of no trade, equilibrium would be at  $r_1$  and  $Y_1$ .
- Let there be an open economy and the world real interest rate is  $r^*$ . In this case, domestic demand (**absorption**) is  $C+I+G < Y^s$ .

---

---

---

---

---

---

---

---

- This country exports the excess supply of goods and accumulates assets from other countries.

---

---

---

---

---

---

---

---

## What happens to Mexico if the US is faced with a negative productivity shock?

- In the US, a negative productivity shock today, cause the output supply curve to shift to the left and the real interest rate increases.
- In Mexico, the higher world real interest rate causes demand to increase as US tries to smooth consumption and Mexican output increases.

---

---

---

---

---

---

---

---

- A negative foreign shock doesn't mean that Mexico must also suffer.

---

---

---

---

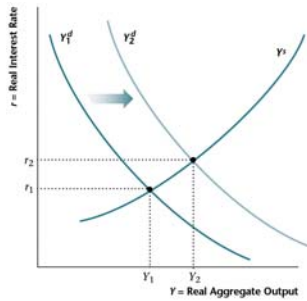
---

---

---

---

**Figure 13.14** An Increase in the World Real Interest Rate




---

---

---

---

---

---

---

---

**What happens if government spending is temporarily increased?**

- An increase in  $G$  causes the output demand curve to shift to the right.
- Consumer know that taxes will be higher so wealth is less. The labor supply curve shifts right as does the output supply curve.
- The demand shift exceeds the supply shift so the current account surplus decreases.
- The consumer borrows to maintain living standard.

---

---

---

---

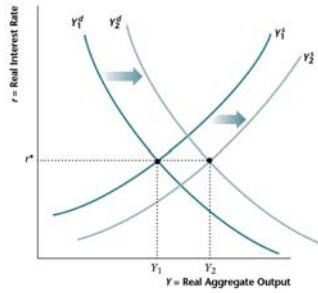
---

---

---

---

**Figure 13.15** A Temporary Increase in Government Spending




---

---

---

---

---

---

---

---

---

---

**What happens if government spending is permanently increased?**

- An increase in  $G$  does not shift the output demand curve because of the increase in the present value of taxes causes  $C$  to fall.
- The labor supply curve shifts right (fall in wealth) as does the output supply curve.
- The current account surplus must increase..

---

---

---

---

---

---

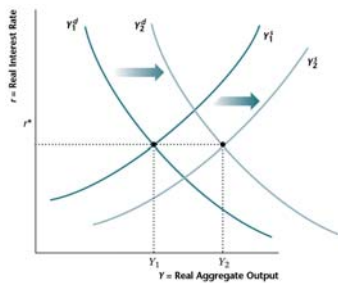
---

---

---

---

**Figure 13.16** A Permanent Increase in Government Spending




---

---

---

---

---

---

---

---

---

---