

Economics 452 International Trade Theory and Policy Fall 2009HECKSCHER-OHLIN MODEL

- 1-4 China is relatively scarce in capital to labor compared to the ROW. Electronics production relatively intensively uses capital to labor compared to textiles. China is assumed to have the same technology and relative demand as the ROW.
1. China has comparative advantage in
 - a) electronics
 - b) textiles
 - c) both electronics and textiles
 - d) neither electronics nor textiles
 - e) cannot tell from the information provided

 2. Under free trade, China produces more _____ than the ROW.
 - a) electronics
 - b) textiles
 - c) electronics relative to textiles
 - d) textiles relative to electronics
 - e) cannot tell from the information provided

 3. Under free trade, China exports
 - a) electronics
 - b) textiles
 - c) both electronics and textiles
 - d) neither electronics nor textiles
 - e) cannot tell from the information provided

 4. In China, production of electronics relative to textiles would rise if its
 - a) supply of capital decreases
 - b) supply of labor decreases
 - c) supply of labor increases
 - d) supply of capital relative to labor decreases
 - e) supply of capital relative to labor increases

- 5-8 The United States is relatively scarce in unskilled workers to skilled workers compared to Mexico. The countries have the same technology and relative demand. Each country produces both goods. As move from autarky to free trade, the relative price of high-tech to low-tech goods rises in the United States and falls in Mexico. Low-tech goods are relatively intensive in unskilled workers.
5. In the United States, the wage paid to unskilled workers:
- a) rises by more than the price of goods
 - b) rises by less than the price of goods
 - c) stays the same
 - d) falls by less than the price of goods
 - e) falls by more than the price of goods
6. In Mexico, the wage paid to unskilled workers:
- a) rises by more than the price of goods
 - b) rises by less than the price of goods
 - c) stays the same
 - d) falls by less than the price of goods
 - e) falls by more than the price of goods
7. In Mexico, who is hurt by free trade?
- a) unskilled workers
 - b) skilled workers
 - c) both skilled and unskilled workers
 - d) no one - both skilled and unskilled workers gain in Mexico
 - e) depends on how workers spend their income
8. In the United States, who is hurt by free trade?
- a) unskilled workers
 - b) skilled workers
 - c) both skilled and unskilled workers
 - d) no one - both skilled and unskilled workers gain in the US
 - e) depends on how workers spend their income

STANDARD TRADE MODEL

- 9-12 Free trade prevails between the United States and China. Suppose the United States experiences a contraction (negative economic growth) that causes US production of cloth to shrink relative to US production of food, while China has zero economic growth.
9. The primary effect of the contraction on the United States is a:
- a) benefit
 - b) burden
 - c) none
 - d) benefit, if the United States has comparative advantage in cloth
 - e) burden, if the United States has comparative advantage in cloth
10. In world markets, the relative supply of cloth to food:
- a) rises
 - b) falls
 - c) stays the same
 - d) rises, if the United States has comparative advantage in cloth
 - e) falls, if the United States has comparative advantage in cloth
11. In world markets, the relative price of cloth to food:
- a) rises
 - b) falls
 - c) stays the same
 - d) rises, if the United States has comparative advantage in cloth
 - e) falls, if the United States has comparative advantage in cloth
12. The secondary effect of the contraction on the United States is a terms of trade:
- a) improvement
 - b) deterioration
 - c) unchanged
 - d) improvement, if the United States has comparative advantage in cloth
 - e) deterioration, if the United States has comparative advantage in cloth

- 13-16 Free trade prevails between the United States and Africa. Suppose the United States transfers one million dollars to NGOs fighting Malaria in Africa. More of the money will be spent on mosquito nets than if the United States were to keep the money.
13. The primary effect of the transfer on the United States is:
- a) benefit
 - b) burden
 - c) none
 - d) benefit, if Africa has comparative advantage in mosquito nets
 - e) burden, if Africa has comparative advantage in mosquito nets
14. Due to the transfer, world relative demand for mosquito nets:
- a) rises
 - b) falls
 - c) stays the same
 - d) rises, if Africa has comparative advantage in mosquito nets
 - e) falls, if Africa has comparative advantage in mosquito nets
15. In world markets, the relative price of mosquito nets to other goods:
- a) rises
 - b) falls
 - c) stays the same
 - d) rises, if Africa has comparative advantage in mosquito nets
 - e) falls, if Africa has comparative advantage in mosquito nets
16. The secondary effect of the transfer on the United States is a terms of trade:
- a) improvement
 - b) deterioration
 - c) unchanged
 - d) improvement, if Africa has comparative advantage in mosquito nets
 - e) deterioration, if Africa has comparative advantage in mosquito nets

FACTOR PROPORTIONS MODEL PROBLEMS

Producing one yard of cloth requires 3 workers and 1 acre of land, while producing one pound of food requires 1 worker and 2 acres of land. Both countries have 60 workers; the United States has 45 acres of land, while ROW has 70. The price of food is always \$49/pound; the price of cloth is \$47/yard in the United States in autarky and \$72/yard in both countries under free trade.

1. Determine and compare the relative abundance of factors across countries.

Determine and compare the relative intensity of factor use across goods.

Determine the pattern of comparative advantage and the pattern of trade.

2. Construct the labor constraint (same for both countries).

Construct the U.S. land constraint.

Determine the U.S. production bundle that fully employs both factors.

3. Construct the ROW land constraint.

Determine the ROW production bundle that fully employs both factors.

Compare the relative production of cloth to food across countries.

Draw graph of factor constraints here, with food on the vertical axis. Indicate values for the endpoints and for the quantities produced in each country.

4. Construct the pricing equation for food (same always for both countries).

Construct the U.S. pricing equation for cloth in autarky.

Determine U.S. factor prices in autarky that allow both goods to be priced at cost.

5. Construct the pricing equation for cloth under free trade (same for both countries).

Determine the factor prices under free trade that allow both goods to be priced at cost.

Compare the U.S. relative factor prices (wage relative to rent) under free trade to autarky.

Draw graph of pricing equations here, with rent on the vertical axis. Indicate values for the endpoints and for the factor prices before and after trade.

6. Calculate and compare the proportional changes in the wage, rent, price of cloth, and price of food.

In the United States, owners of which factor would oppose a free trade agreement?

How can this group be identified, even in autarky?

On my honor as an Aggie, I have neither given nor received unauthorized aid on this exam.

Signature _____

SECOND MIDTERM EXAM SOLUTIONS

Economics 452 International Trade Theory and Policy Fall 2009

MULTIPLE CHOICE

- 1b China has comparative advantage in textiles.
- 2d Under free trade, China produces more textiles relative to electronics.
- 3b Under free trade, China exports textiles.
- 4e In China, production of electronics relative to textiles would rise if its supply of capital relative to labor increases.

- 5e In the United States, the wage paid to unskilled workers falls by more than the price of goods.
- 6a In Mexico, the wage paid to unskilled workers rises by more than the price of goods.
- 7b In Mexico, skilled workers are hurt by free trade.
- 8a In the United States, unskilled workers are hurt by free trade.

- 9b The primary effect of the contraction in the United States is a burden.
- 10b In world markets, the relative supply of cloth falls.
- 11a In world markets, the relative price of cloth to food rises.
- 12d The secondary effect of the contraction on the United States is a terms of trade improvement, if the United States has comparative advantage in cloth.

- 13b The primary effect of the transfer on the United States is burden.
- 14a Due to the transfer of money, world relative demand for mosquito nets rises.
- 15a In world markets, the relative price of mosquito nets to other goods rises.
- 16e The secondary effect on the United States is a terms of trade deterioration, if Africa has comparative advantage in mosquito nets.

FACTOR PROPORTIONS MODEL PROBLEMS

Producing one yard of cloth requires 3 workers and 1 acre of land, while producing one pound of food requires 1 worker and 2 acres of land. Both countries have 60 workers; the United States has 45 acres of land, while ROW has 70. The price of food is always \$49/pound; the price of cloth is \$47/yard in the United States in autarky and \$72/yard in both countries under free trade.

1. Determine and compare the relative abundance of factors across countries.

The United States is relatively labor abundant

$$\frac{4}{3} = \frac{60}{45} = \frac{L}{T} > \frac{L^*}{T^*} = \frac{60}{70}$$

Determine and compare the relative intensity of factor use across goods.

Cloth production is relatively labor intensive

$$3 = \frac{3}{1} = \frac{a_{LC}}{a_{TC}} > \frac{a_{LF}}{a_{TF}} = \frac{1}{2}$$

Determine the pattern of comparative advantage and the pattern of trade.

The United States has comparative advantage in cloth and the ROW in food. The United States will export cloth and import food, while the ROW will export food and import cloth.

2. Construct the labor constraint (same for both countries).

$$a_{LC}Q_C + a_{LF}Q_F = L, \quad 3Q_C + Q_F = 60, \quad Q_F = 60 - 3Q_C$$

Construct the U.S. land constraint.

$$a_{TC}Q_C + a_{TF}Q_F = T, \quad Q_C + 2Q_F = 45, \quad Q_F = 22.5 - \frac{1}{2}Q_C$$

Determine the U.S. production bundle that fully employs both factors.

$$60 - 3Q_C = \frac{45}{2} - \frac{1}{2}Q_C, \quad \frac{5}{2}Q_C = \frac{75}{2}, \quad Q_C = \frac{75}{5} = 15$$

$$Q_F = 60 - 3Q_C = 60 - 3(15) = 60 - 45 = 15$$

3. Construct the ROW land constraint.

$$a_{TC} Q_C^* + a_{TF} Q_F^* = T^*, \quad Q_C^* + 2Q_F^* = 70, \quad Q_F^* = 35 - \frac{1}{2} Q_C^*$$

Determine the ROW production bundle that fully employs both factors.

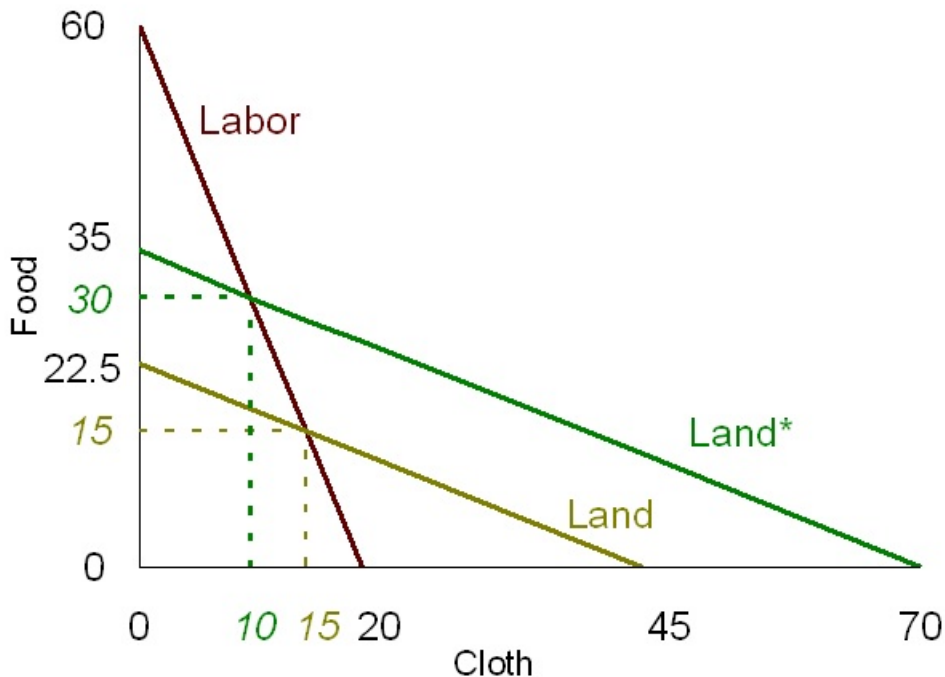
$$60 - 3Q_C^* = 35 - \frac{1}{2} Q_C^*, \quad \frac{5}{2} Q_C^* = 25, \quad Q_C^* = \frac{50}{5} = 10$$

$$Q_F^* = 60 - 3Q_C^* = 60 - 3(10) = 60 - 30 = 30$$

Compare the relative production of cloth to food across countries.
The United States produces more cloth relative to food than ROW.

$$1 = \frac{15}{15} = \frac{Q_C}{Q_F} > \frac{Q_C^*}{Q_F^*} = \frac{10}{30} = \frac{1}{3}$$

Graph of factor constraints: *horizontal axis labeled Cloth and vertical axis labeled Food; Labor endpoints 20 and 60; Land endpoints 45 and 22.5 (or 45/2); Land* endpoints 70 and 35; Home produces 15 cloth and 15 food; ROW produces 10 cloth and 30 food.*



4. Construct the pricing equation for food (same always for both countries).

$$a_{LF}w + a_{TF}r = P_F, \quad w + 2r = 49, \quad r = \frac{49}{2} - \frac{1}{2}w$$

Construct the U.S. pricing equation for cloth in autarky.

$$a_{LC}w^A + a_{TC}r^A = P_C^A, \quad 3w^A + r^A = 47, \quad r^A = 47 - 3w^A$$

Determine U.S. factor prices in autarky that allow both goods to be priced at cost.

$$\frac{49}{2} - \frac{1}{2}w^A = 47 - 3w^A, \quad \frac{5}{2}w^A = \frac{45}{2}, \quad w^A = \frac{45}{5} = 9$$

$$r^A = 47 - 3w^A = 47 - 3(9) = 47 - 27 = 20$$

5. Construct the pricing equation for cloth under free trade (same for both countries).

$$a_{LC}w + a_{TC}r = P_C, \quad 3w + r = 72, \quad r = 72 - 3w$$

Determine the factor prices under free trade that allow both goods to be priced at cost.

$$\frac{49}{2} - \frac{1}{2}w = 72 - 3w, \quad \frac{5}{2}w = \frac{95}{2}, \quad w = \frac{95}{5} = 19$$

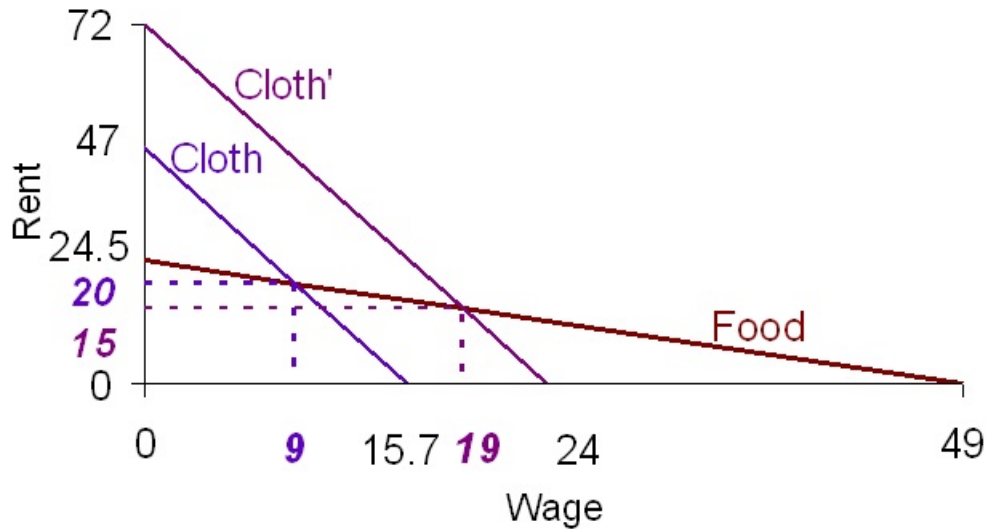
$$r = 72 - 3w = 72 - 3(19) = 72 - 57 = 15$$

Compare the U.S. relative factor prices (wage relative to rent) under free trade to autarky.

The wage relative to the rent rises in the United States in the move from autarky to free trade.

$$\frac{9}{20} = \frac{w^A}{r^A} < \frac{w}{r} = \frac{19}{15}$$

Graph of factor constraints: horizontal axis labeled Wage and vertical axis labeled Rent; Food endpoints 49 and 24.5 (or 49/2); Cloth endpoints 15.7 (or 47/3) and 47; Cloth' endpoints 24 and 72; Home autarky has wage 9 and rent 20; wage 19 and rent 15 with free trade.



6. Calculate and compare the proportional changes in the wage, rent, price of cloth, and price of food.
In the United States, the wage rises by more than the price of either good, while the rent falls relative to the price of either good.

$$\hat{w} = 111.1\% > \hat{P}_C = 53.1\% > \hat{P}_F = 0\% > \hat{r} = -25\%$$

$$\hat{P}_C = \frac{72 - 47}{47} = \frac{25}{47} = 53.1\%$$

$$\hat{w} = \frac{19 - 9}{9} = \frac{10}{9} = 111.1\%$$

$$\hat{r} = \frac{15 - 20}{20} = -\frac{5}{20} = -\frac{1}{4} = -25\%$$

In the United States, owners of which factor would oppose a free trade agreement? *Landlords*

How can this group be identified, even in autarky? *Own relatively scarce factor*