

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

1-4 The United States is abundant in land to labor compared to Germany. Chocolate production relatively intensively uses labor to land compared to french fries. The countries have the same technology and relative demand.

1. Germany produces more _____ than the United States.
 - a) chocolate
 - b) french fries
 - c) chocolate relative to french fries
 - d) french fries relative to chocolate
 - e) cannot tell from the information provided

2. Germany has comparative advantage in:
 - a) french fries
 - b) chocolate
 - c) french fries and chocolate
 - d) french fries and sometimes chocolate
 - e) chocolate and sometimes french fries

3. Under free trade, Germany imports:
 - a) french fries
 - b) chocolate
 - c) french fries and chocolate
 - d) french fries and sometimes chocolate
 - e) chocolate and sometimes french fries

4. Opening up to trade, the price of _____ rises in the United States.
 - a) chocolate
 - b) french fries
 - c) chocolate relative to french fries
 - d) french fries relative to chocolate
 - e) cannot tell from the information provided

- 5-8 Mexico is abundant in blue-collar workers to white-collar workers compared to the United States. 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. High-tech goods are relatively intensive in white-collar workers.
5. In the United States, the wage paid to blue-collar 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 the United States, the wage paid to white-collar 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, the wage paid to blue-collar 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
8. In Mexico, the wage paid to white-collar 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

STANDARD TRADE MODEL

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

- 13-16 Free trade prevails between the United States and Sudan.
Suppose the United States transfers one billion dollars to aid organizations in Sudan. More of the money will be spent on food than if the United States kept the money.
13. The primary effect of the transfer on the United States is:
- a) benefit
 - b) burden
 - c) none
 - d) benefit, if Sudan has comparative advantage in fuel
 - e) burden, if Sudan has comparative advantage in fuel
14. Due to the transfer of money, world relative demand for food:
- a) rises
 - b) falls
 - c) stays the same
 - d) rises, if Sudan has comparative advantage in fuel
 - e) falls, if Sudan has comparative advantage in fuel
15. In world markets, the relative price of fuel to food:
- a) rises
 - b) falls
 - c) stays the same
 - d) rises, if Sudan has comparative advantage in fuel
 - e) falls, if Sudan has comparative advantage in fuel
16. The secondary effect on the United States is a terms of trade:
- a) improvement
 - b) deterioration
 - c) unchanged
 - d) improvement, if Sudan has comparative advantage in fuel
 - e) deterioration, if Sudan has comparative advantage in fuel

FACTOR PROPORTIONS MODEL PROBLEMS

Producing one yard of cloth requires 2 workers and 1 acre of land, while producing one pound of food requires 1 worker and 3 acres of land. Both countries have 300 workers; the United States has 300 acres of land, while ROW has 600. The price of food is always \$90/pound; the price of cloth is \$60/yard in the United States in autarky and \$90/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

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MULTIPLE CHOICE

- 1c Germany produces more chocolate relative to french fries than the United States.
- 2b Germany has comparative advantage in chocolate.
- 3a Under free trade, Germany exports chocolate.
- 4d Opening up to trade, the price of french fries relative to chocolate rises in the United States.

- 5e In the United States, the wage paid to blue-collar workers falls by more than the price of goods.
- 6a In the United States, the wage paid to white-collar workers rises by more than the price of goods.
- 7a In Mexico, the wage paid to blue-collar workers rises by more than the price of goods.
- 8e In Mexico, the wage paid to white-collar workers falls by more than the price of goods.

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

- 13b The primary effect of the transfer on the United States is burden.
- 14a Due to the transfer of money, world relative demand for food rises.
- 15b In world markets, the relative price of fuel to food falls.
- 16d The secondary effect on the United States is a terms of trade improvement, if Sudan has comparative advantage in fuel.

FACTOR PROPORTIONS MODEL PROBLEMS

Producing one yard of cloth requires 2 workers and 1 acre of land, while producing one pound of food requires 1 worker and 3 acres of land. Both countries have 300 workers; the United States has 300 acres of land, while ROW has 600. The price of food is always \$90/pound; the price of cloth is \$60/yard in the United States in autarky and \$90/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

$$1 = \frac{300}{300} = \frac{L}{T} > \frac{L^*}{T^*} = \frac{300}{600} = \frac{1}{2}$$

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

Cloth production is relatively labor intensive

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

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).

$$a_{LC} Q_C + a_{LF} Q_F = L, \quad 2Q_C + Q_F = 300, \quad Q_F = 300 - 2Q_C$$

Construct the U.S. land constraint.

$$a_{TC} Q_C + a_{TF} Q_F = T, \quad Q_C + 3Q_F = 300, \quad Q_F = 100 - \frac{1}{3}Q_C$$

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

$$300 - 2Q_C = 100 - \frac{1}{3}Q_C, \quad \frac{5}{3}Q_C = 200, \quad Q_C = \frac{600}{5} = 120$$

$$Q_F = 300 - 2Q_C = 300 - 2(120) = 300 - 240 = 60$$

3. Construct the ROW land constraint.

$$a_{TC} Q_C^* + a_{TF} Q_F^* = T^*, \quad Q_C^* + 3Q_F^* = 600, \quad Q_F^* = 200 - \frac{1}{3}Q_C^*$$

Determine the ROW production bundle that fully employs both factors.

$$300 - 2Q_C^* = 200 - \frac{1}{3}Q_C^*, \quad \frac{5}{3}Q_C^* = 100, \quad Q_C^* = \frac{300}{5} = 60$$

$$Q_F^* = 300 - 2Q_C^* = 300 - 2(60) = 300 - 120 = 180$$

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

$$2 = \frac{120}{60} = \frac{Q_C}{Q_F} > \frac{Q_C^*}{Q_F^*} = \frac{60}{180} = \frac{1}{3}$$

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

$$a_{LF} w + a_{TF} r = P_F, \quad w + 3r = 90, \quad r = 30 - \frac{1}{3}w$$

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

$$a_{LC} w^A + a_{TC} r^A = P_C^A, \quad 2w^A + r^A = 60, \quad r^A = 60 - 2w^A$$

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

$$30 - \frac{1}{3}w^A = 60 - 2w^A, \quad \frac{5}{3}w^A = 30, \quad w^A = \frac{90}{5} = 18$$

$$r^A = 60 - 2w^A = 60 - 2(18) = 60 - 36 = 24$$

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

$$a_{LC} w + a_{TC} r = P_C, \quad 2w + r = 90, \quad r = 90 - 2w$$

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

$$30 - \frac{1}{3}w = 90 - 2w, \frac{5}{3}w = 60, w = \frac{180}{5} = 36$$

$$r = 90 - 2w = 90 - 2(36) = 90 - 72 = 18$$

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.

$$\frac{3}{4} = \frac{18}{24} = \frac{w^A}{r^A} < \frac{w}{r} = \frac{36}{18} = 2$$

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.

$$\hat{w} = 100\% > \hat{P}_C = 50\% > \hat{P}_F = 0\% > \hat{r} = -25\%$$

$$\hat{P}_C = \frac{90 - 60}{60} = \frac{30}{60} = 50\%$$

$$\hat{w} = \frac{36 - 18}{18} = \frac{18}{18} = 100\%$$

$$\hat{r} = \frac{18 - 24}{24} = -\frac{6}{24} = -\frac{1}{4} = -25\%$$

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

Landlords

How can this group be identified, even in autarky?

They own the relatively scarce factor in the United States.



