

Second Midterm Exam

FACTOR PROPORTIONS MODEL

1-4 Car production relatively intensively uses labor to land compared to cheese production. The United States is abundant in labor to land compared to Italy.

1. The United States produces _____ relative to Italy.
 - a) more cars
 - b) less cars
 - c) more cars and cheese
 - d) less cars relative to cheese
 - e) more cars relative to cheese

2. Italy has comparative advantage in
 - a) cars
 - b) cheese
 - c) cars and cheese
 - d) cars and sometimes cheese
 - e) cheese and sometimes cars

3. Under free trade, Italy exports
 - a) cars
 - b) cheese
 - c) cars and cheese
 - d) cars and sometimes cheese
 - e) cheese and sometimes cars

4. Under free trade, the United States exports
 - a) cars
 - b) cheese
 - c) cars and cheese
 - d) cars and sometimes cheese
 - e) cheese and sometimes cars

- 5-8 Olive production relatively intensively uses land to labor compared to milk production. Italy is less abundant in labor relative to land compared to the United States.
5. In Italy, who would benefit from free trade?
- a) workers
 - b) landowners
 - c) both workers and landowners
 - d) neither workers nor landowners
 - e) depends on spending patterns
6. In Italy, who would object to free trade?
- a) workers
 - b) landowners
 - c) both workers and landowners
 - d) neither workers nor landowners
 - e) depends on spending patterns
7. In the United States, who would benefit from free trade?
- a) workers
 - b) landowners
 - c) both workers and landowners
 - d) neither workers nor landowners
 - e) depends on spending patterns
8. In the United States, who would object to free trade?
- a) workers
 - b) landowners
 - c) both workers and landowners
 - d) neither workers nor landowners
 - e) depends on spending patterns

STANDARD TRADE MODEL

9-12 The United States has comparative advantage over Iraq in steel relative to oil. Free trade prevails and both countries are large. Suppose the United States transfers \$1 billion to Iraq (to aid in the post-war recovery).

9. The primary effect on the United States is:
- a) benefit
 - b) burden
 - c) none
 - d) benefit, if Iraq spends less of each \$1 on oil
 - e) burden, if Iraq spends less of each \$1 on oil
10. The secondary effect on the United States is:
- a) benefit
 - b) burden
 - c) none
 - d) benefit, if Iraq spends less of each \$1 on oil
 - e) burden, if Iraq spends less of each \$1 on oil
11. The primary effect on Iraq is:
- a) benefit
 - b) burden
 - c) none
 - d) benefit, if Iraq spends less of each \$1 on oil
 - e) burden, if Iraq spends less of each \$1 on oil
12. The secondary effect on Iraq is:
- a) benefit
 - b) burden
 - c) none
 - d) benefit, if Iraq spends less of each \$1 on oil
 - e) burden, if Iraq spends less of each \$1 on oil

13-16 The United States has comparative advantage over Iraq in tourism relative to oil. Free trade prevails and both countries are large. Suppose Iraq experiences economic growth as a result of the recovery from war (but the United States does not).

13. The primary effect on the United States is:
- a) benefit
 - b) burden
 - c) none
 - d) benefit, if the growth is biased towards oil
 - e) burden, if the growth is biased towards oil
14. The secondary effect on the United States is:
- a) benefit
 - b) burden
 - c) none
 - d) benefit, if the growth is biased towards oil
 - e) burden, if the growth is biased towards oil
15. The primary effect on Iraq is:
- a) benefit
 - b) burden
 - c) none
 - d) benefit, if the growth is biased towards oil
 - e) burden, if the growth is biased towards oil
16. The secondary effect on Iraq is:
- a) benefit
 - b) burden
 - c) none
 - d) benefit, if the growth is biased towards oil
 - e) burden, if the growth is biased towards oil

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 360 workers; the United States has 240 acres of land, while Italy has 360. The price of food is always \$60/pound; the price of cloth is \$45/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 Italian land constraint. Determine the Italian production bundle that fully employs both factors. Compare the relative production of cloth to food across countries. *Draw graph of factor constraints.*
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 under free trade to autarky. *Draw graph of pricing equations.*
6. In the United States, owners of which factor would oppose a free trade agreement? How can this group be identified, even in autarky?

Second Midterm Exam Solutions

MULTIPLE CHOICE

- 1e The United States produces more cars relative to cheese compared to Sri Lanka.
- 2b Italy has comparative advantage in cheese, which relatively intensively uses land, its relatively abundant factor.
- 3b Under free trade, Italy exports cheese, its comparative advantage good.
- 4a Under free trade, the United States exports cars.
- 5b Italian landowners would benefit from free trade.
- 6a Italian workers would object to free trade.
- 7a U.S. workers would benefit from free trade
- 8b U.S. landowners would object to free trade.
- 9b The United States suffers a primary burden.
- 10d The United States enjoys a secondary benefit if Iraq spends less on oil due to a terms of trade improvement.
- 11a Iraq enjoys a primary benefit.
- 12e Iraq suffers a secondary burden if Iraq spends less on oil due to a terms of trade deterioration.
- 13c The United States experiences no primary effect.
- 14d The United States enjoys a secondary benefit due to a terms of trade improvement if the growth is biased toward oil.
- 15a Iraq enjoys a primary benefit from the growth.
- 16e Iraq suffers a secondary burden due to a terms of trade deterioration if the growth is biased toward oil.

PROBLEMS

1. The United States is relatively labor abundant

$$\frac{3}{2} = \frac{360}{240} = \frac{L}{T} > \frac{L^*}{T^*} = \frac{360}{360} = 1$$

Cloth production is relatively labor intensive

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

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

2. The labor constraint is

$$a_{LC}Q_C + a_{LF}Q_F = L \rightarrow 3Q_C + Q_F = 360 \leftrightarrow Q_F = 360 - 3Q_C$$

The U.S. land constraint is

$$a_{TC}Q_C + a_{TF}Q_F = T \rightarrow Q_C + 2Q_F = 240 \leftrightarrow Q_F = 120 - \frac{1}{2}Q_C$$

The United States's production of cloth and food that fully employs both labor and land is (show math)

$$Q_C = 96, Q_F = 72$$

3. Italy's land constraint is

$$a_{TC}Q_C^* + a_{TF}Q_F^* = T^* \rightarrow Q_C^* + 2Q_F^* = 360 \leftrightarrow Q_F^* = 180 - \frac{1}{2}Q_C^*$$

Italy's production of cloth and food that fully employs both labor and land is (show math)

$$Q_C^* = 72, Q_F^* = 144$$

The United States produces more cloth relative to food than Italy

$$\frac{4}{3} = \frac{96}{72} = \frac{Q_C}{Q_F} > \frac{Q_C^*}{Q_F^*} = \frac{72}{144} = \frac{1}{2}$$

4. The food pricing equation is

$$a_{LF}w + a_{TF}r = P_F \rightarrow w + 2r = 60 \leftrightarrow r = 30 - \frac{1}{2}w$$

The U.S. cloth pricing equation under autarky is

$$a_{LC}w^A + a_{TC}r^A = P_C^A \rightarrow 3w^A + r^A = 45 \leftrightarrow r^A = 45 - 3w^A$$

The U.S. factor prices that permit both goods to sell at cost under autarky is (show math)

$$w^A = 6, \quad r^A = 27$$

5. The cloth pricing equation under free trade is

$$a_{LC}w + a_{TC}r = P_C \rightarrow 3w + r = 90 \leftrightarrow r = 90 - 3w$$

The factor prices that permit both goods to sell at cost under free trade is (show math)

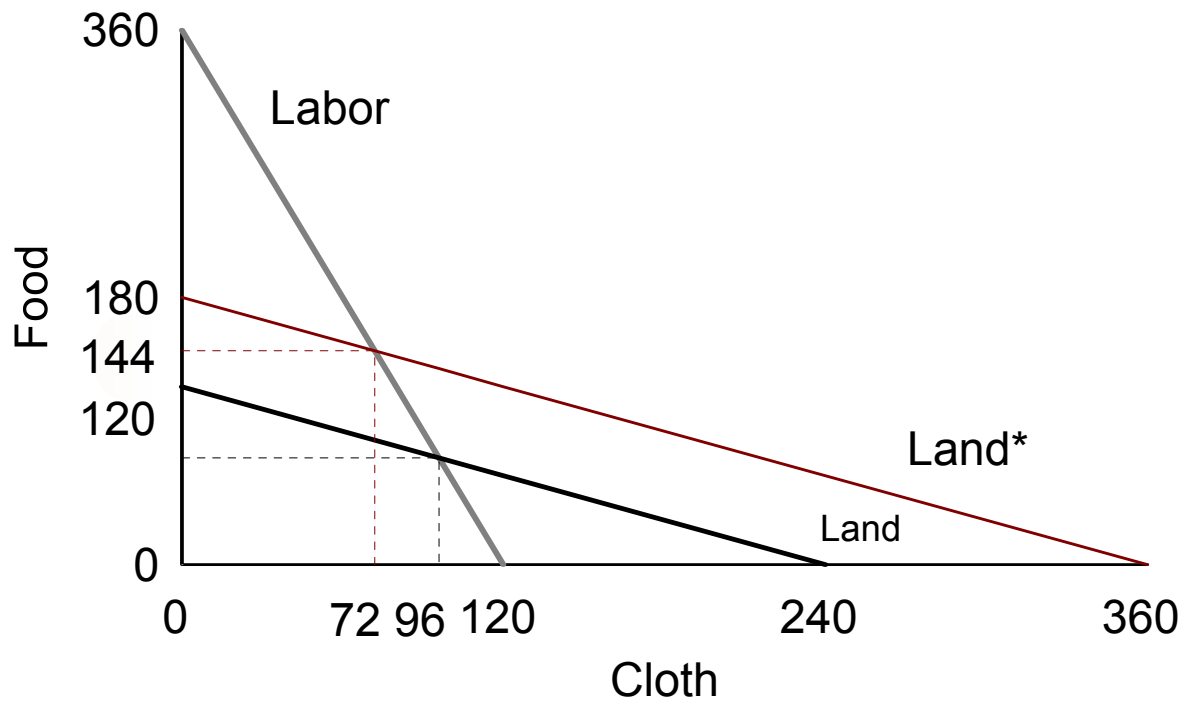
$$w = 24, \quad r = 18$$

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

$$\frac{2}{9} = \frac{6}{27} = \frac{w^A}{r^A} < \frac{w}{r} = \frac{24}{18} = \frac{4}{3}$$

6. In the United States, landlords would oppose a free trade agreement. The purchasing power of their income would fall because the rent falls relative to the price of either good. Landlords are the owners of the relatively scarce factor in the United States, which can be determined by comparing factor endowment ratios even in autarky (as done for problem #1).

Production



U.S. Pricing

