First Midterm Exam, Fall 2005

WORLD TRADE

1. Who is the largest trading partner of the United States?
   a. Mexico
   b. Canada
   c. China
   d. Germany
   e. Japan

2. What is the largest destination of Texas exports?
   a. Mexico
   b. Canada
   c. China
   d. Germany
   e. Japan

3. What is the largest source of Texas imports?
   a. Mexico
   b. Canada
   c. China
   d. Venezuela
   e. Taiwan

4. Currently, most of world trade occurs in what?
   a. Agriculture
   b. Mining
   c. Manufactures
   d. Services
   e. None of the above

5. According to the gravity model, as the gross domestic product (GDP) of a country rises, what is predicted to happen to that country's share of U.S. trade?
   a. Fall
   b. Rise
   c. Remain the same
   d. Fall or remain the same
   e. No clear prediction

6. The gravity model suggests that the trade volume of a pair of countries twice as far apart as another pair of similar countries, all else equal, should compare how to that of the closer countries?
   a. 400% - 500% less
   b. 250% - 300% less
   c. 70% - 100% less
   d. 250% - 300% ,ore
   e. 400% - 500% more

7. The impact of distance on trade volumes has shrunk over time due to what?
   a. Global population growth
   b. More frequent wars
   c. Modern transportation
   d. Improvements in communication
   e. Both c and d

8. That Ohio's trade with British Columbia is less than Ontario's trade with British Columbia (each measured as a percentage of GDP) best illustrates the impact of what for trade volumes?
   a. Size
   b. Borders
   c. Cultural affinity
   d. Distance
   e. None of the above

RICARDIAN MODEL

9-12. Cheese and wine are produced with labor. Suppose that under free trade, Canada produces only wine.

9. Under free trade, the United States produces
   a. Only cheese
   b. Only wine
   c. Nothing
   d. Cheese and sometimes wine
   e. Wine and sometimes cheese

10. The United States has comparative advantage in
   a. Only cheese
   b. Only wine
   c. Both cheese and wine
   d. Neither cheese nor wine
   e. Would need information about unit labor requirements to know

11. The United States has absolute advantage in
   a. Only cheese
   b. Only wine
   c. Both cheese and wine
   d. Neither cheese nor wine
   e. Would need information about unit labor requirements to know

12. Under free trade, the United States exports
   a. Only cheese
   b. Only wine
   c. Nothing
   d. Cheese and sometimes wine
   e. Wine and sometimes cheese

13-16 The United States and Mexico engage in free trade in cheese and wine, which are produced with labor. The relative price of cheese to wine under free trade equals the opportunity cost of cheese in terms of wine in Mexico.

13. Does the United States gain from trade?
    a. Yes, definitely
    b. No, definitely
    c. Yes, but only if produce just cheese
    d. Yes, but only if produce just wine
    e. Yes, but only if produce both goods

14. Does Mexico gain from trade?
    a. Yes, definitely
    b. No, definitely
    c. Yes, but only if produce just cheese
    d. Yes, but only if produce just wine
    e. Yes, but only if produce both goods

15. How does the wage paid in the cheese sector compare to the wage paid in the wine sector in the United States?
    a. Wage is higher in the cheese sector
    b. Wage is lower in the cheese sector
    c. Wage is the same in the cheese sector
    d. Wage is the same or higher in the cheese sector
    e. Cannot tell from the information provided

16. How does the wage paid in the cheese sector compare to the wage paid in the wine sector in Mexico?
    a. Wage is higher in the cheese sector
    b. Wage is lower in the cheese sector
    c. Wage is the same in the cheese sector
    d. Wage is the same or lower in the cheese sector
    e. Cannot tell from the information provided

PROBLEMS (Ricardian Model)

In the United States (US), producing one pound of cheese requires ten units of labor, while producing one gallon of wine requires two units of labor. In the rest of the world (ROW), producing one pound of cheese requires nine units of labor, while producing one gallon of wine requires one unit of labor. The United States has 900 units of labor and the ROW has 630 units of labor. World relative demand for cheese to wine is

$$RD \equiv \frac{D_C}{D_W} = \frac{P_W}{P_C}.$$

1. Construct the US production possibilities frontier (all three forms). Determine the maximum production of cheese and wine. What is the US opportunity cost of cheese in terms of wine? Where does it appear in the equation describing production possibilities? Draw graph of US production possibilities frontier.

2. Construct the ROW production possibilities frontier (all three forms). Determine the maximum production of cheese and wine. What is the ROW opportunity cost of cheese in terms of wine? Compare the slopes of the two production possibilities frontiers – which is flatter and why? Draw graph of the ROW production possibilities frontier.

3. What is the world relative supply of cheese to wine if each country produces only its comparative advantage good? Construct the world relative supply and world relative demand functions. Find the world equilibrium relative price of cheese in terms of wine under free trade. Draw graph of world relative supply and world relative demand.

4. Determine the optimal production bundle for each country under free trade. Determine whether each country gains from trade and explain the source of any gains from trade.

5. Construct the US trade possibilities frontier (all three forms). Determine the maximum consumption of cheese and wine under free trade. Where does the free trade relative price of cheese in terms of wine appear in the equation describing trade possibilities? Draw graph of US trade possibilities frontier on the PPF graph.

6. Construct the ROW trade possibilities frontier (all three forms). Determine the maximum consumption of cheese and wine under free trade. Compare the slopes of the two trade possibilities frontiers and explain. Draw graph of ROW trade possibilities frontier on the PPF graph.

First Midterm Exam Solutions

MULTIPLE CHOICE

1b Canada is the largest trading partner of the United States.
2a Mexico is the largest destination of Texas exports.
3a Mexico is the largest source of Texas imports.
4c Currently, most of world trade occurs in manufactures.

5b A country's share of U.S. trade should rise as its GDP rises.
6c The trade volume of the more distant pair would be 70% - 100% less.
7e The impact of trade on distance has shrunk over time due to both modern transportation and improvements in communication.
8b That Ohio's trade with British Columbia is less than Ontario's trade with British Columbia (each measured as a percentage of GDP) best illustrates the impact of borders for trade volumes.

9d The United States produces cheese and sometimes wine.
10a The United States has comparative advantage in only cheese.
11e Would need information about unit labor requirements to know.
12a Under free trade, the United States exports only cheese.

13a Yes, the United States definitely gains from trade.
14b No, Mexico definitely does not gain from trade.
15e In the United States, cannot tell from the information provided.
16c In Mexico, the wage in the cheese sector is the same as in the wine sector.

PROBLEMS (Ricardian Model)

In the United States (US), producing one pound of cheese requires ten units of labor, while producing one gallon of wine requires two units of labor. In the rest of the world (ROW), producing one pound of cheese requires nine units of labor, while producing one gallon of wine requires one unit of labor. The United States has 900 units of labor and the ROW has 630 units of labor. World relative demand for cheese to wine is

$$RD \equiv \frac{D_C}{D_W} = \frac{P_W}{P_C}.$$

1. Construct the production possibilities frontier for the United States

$$a_{LC}Q_C + a_{LW}Q_W = L,\ 10Q_C + 2Q_W = 900,\ Q_W = 450 - 5Q_C$$

Determine the maximum production of cheese and wine.

$$\bar{Q}_C = 90,\ \ \bar{Q}_W = 450$$

What is the US opportunity cost of cheese in terms of wine?

$$\frac{a_{LC}}{a_{LW}} = \frac{10}{2} = 5$$

Where does it appear in the equation describing production possibilities?
Absolute value of slope

GRAPH OF PRODUCTION POSSIBILITIES FRONTIER: horizontal axis labeled cheese, vertical axis labeled wine; cheese endpoint 90; wine endpoint 450; PPF label

2. Construct the production possibilities frontier for the ROW.

$$a_{LC}^{*}Q_{C}^{*} + a_{LW}^{*}Q_{W}^{*} = L^{*},\ 9Q_{C}^{*} + Q_{W}^{*} = 630,\ Q_{W}^{*} = 630 - 9Q_{C}^{*}$$

Determine the maximum production of cheese and wine.

$$\bar{Q}_{C}^{*} = 70,\quad \bar{Q}_{W}^{*} = 630$$

What is the ROW opportunity cost of cheese in terms of wine? Compare the slopes of the two production possibilities frontiers – which is flatter and why?

$$\frac{a_{LC}^{*}}{a_{LW}^{*}} = \frac{9}{1} = 9$$

US production possibilities frontier flatter due to lower opportunity cost of cheese in terms of wine.

$$5 = \frac{a_{LC}}{a_{LW}} < \frac{a_{LC}^{*}}{a_{LW}^{*}} = 9$$

GRAPH OF PRODUCTION POSSIBILITIES FRONTIER*: horizontal axis labeled cheese, vertical axis labeled wine; cheese endpoint 70; wine endpoint 630; PPF* label

3. What is the world relative supply of cheese to wine if each country produces only its comparative advantage good?

$$\tilde{RS} = \frac{\bar{Q}_{C}}{\bar{Q}_{W}^{*}} = \frac{90}{630} = \frac{1}{7}$$

Construct the world relative supply and world relative demand functions.

P_C/P_W	RD = P_W/P_C	RS
5	1/5	0 .. 1/7
7	1/7	1/7
9	1/9	1/7 .. ∞

Find the world equilibrium relative price of cheese in terms of wine under free trade.

$$\frac{P_C}{P_W} = 7$$

GRAPH OF RELATIVE DEMAND AND RELATIVE SUPPLY: horizontal axis labeled relative quantity of cheese (to wine), vertical axis labeled relative price of cheese (to wine); first step at 5, second step at 9; jump at 1/7 and free trade relative price 7; other two points on RD; RD label, RS label

4. Determine the optimal production bundle for each country under free trade.

$$Q_C = \bar{Q}_C = 90, \; Q_W = 0$$

$$Q_C^* = 0, \; Q_W^* = \bar{Q}_W^* = 630$$

Determine whether each country gains from trade and explain the source of any gains from trade.

Both countries gain from trade as the free trade relative price differs from both opportunity costs.

5. Construct the trade possibilities frontier for the US.

$$\frac{P_C}{P_W}D_C + D_W = \frac{P_C}{P_W}\bar{Q}_C,\ 7D_C + D_W = 7(90) = 630,\ D_W = 630 - 7D_C$$

Determine the maximum consumption of cheese and wine under free trade.

$$\bar{D}_C = 90,\quad \bar{D}_W = 630$$

Where does the free trade relative price of cheese in terms of wine appear in the equation describing trade possibilities?

Absolute value of slope

GRAPH OF TRADE POSSIBILITIES FRONTIER: cheese endpoint 90; wine endpoint 630; TPF label; position of TPF outside PPF

6. Construct the trade possibilities frontier for the ROW.

$$\frac{P_C}{P_W}D_C^* + D_W^* = \bar{Q}_W^*,\ 7D_C^* + D_W^* = 630,\ D_W^* = 630 - 7D_C^*$$

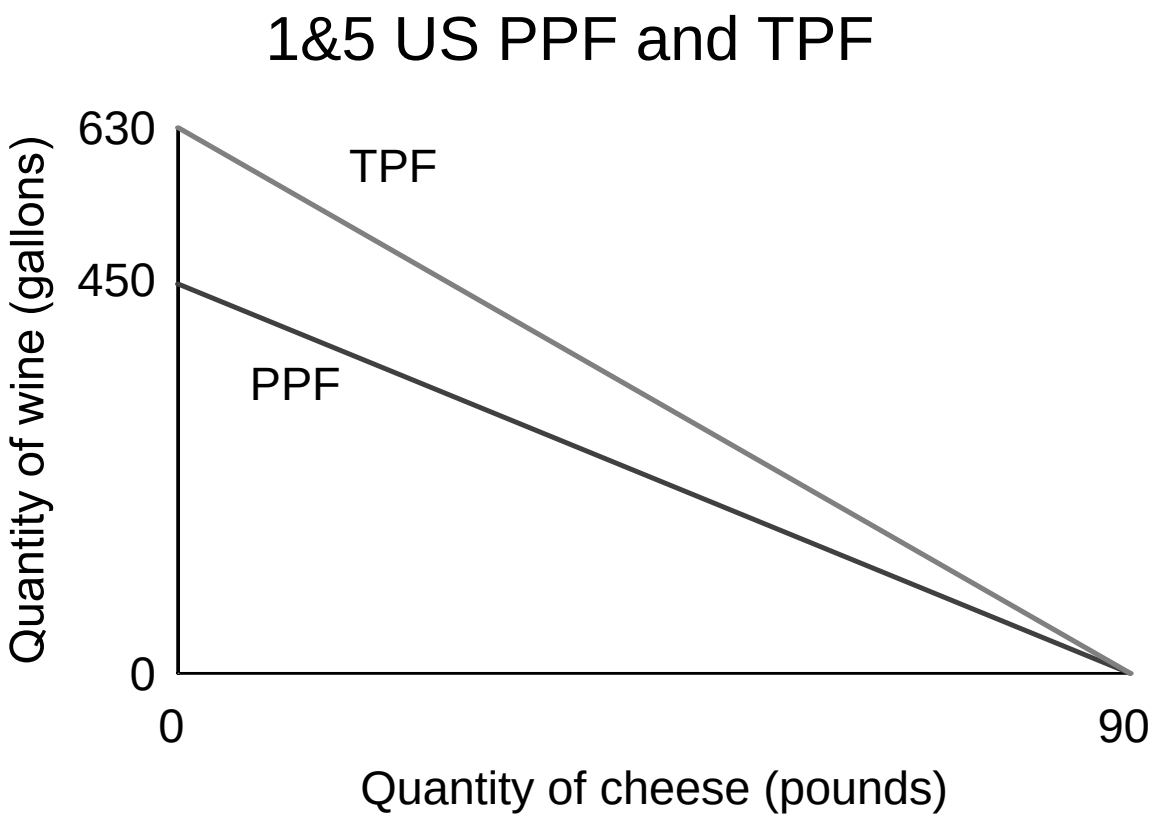
Determine the maximum consumption of cheese and wine under free trade.

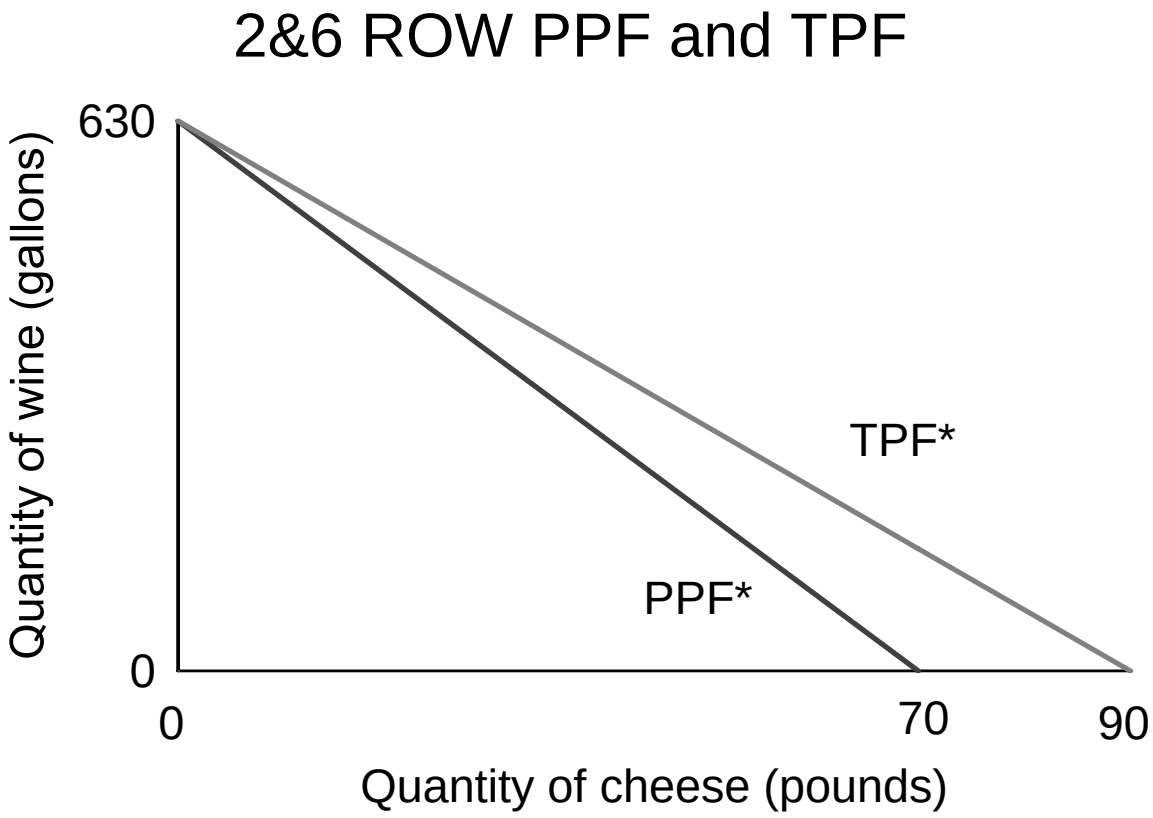
$$\bar{D}_C^* = 90,\quad \bar{D}_W^* = 630$$

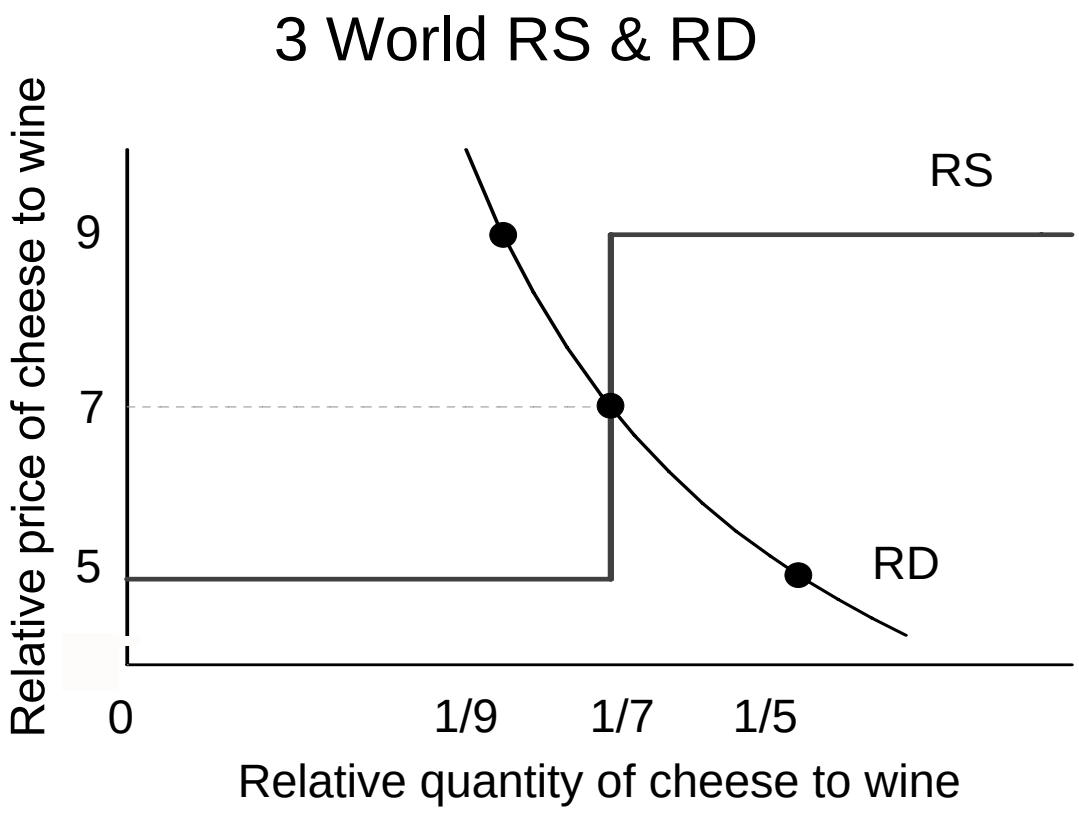
Compare the slopes of the two trade possibilities frontiers and explain.

Same as the two countries face same relative price under free trade

GRAPH OF TRADE POSSIBILITIES FRONTIER*: cheese endpoint 90; wine endpoint 630; TPF* label; position of TPF* outside PPF*


1&5 US PPF and TPF
630
450
0
TPF
PPF
Quantity of wine (gallons)
0
90
Quantity of cheese (pounds)


2&6 ROW PPF and TPF
630
0
Quantity of wine (gallons)
TPF*
PPF*
0
70
90
Quantity of cheese (pounds)


3 World RS & RD
Relative price of cheese to wine
9
7
5
RS
RD
0
1/9
1/7
1/5
Relative quantity of cheese to wine