Final Exam, Spring 2004

TRADE POLICIES

1-4 The United States, a large country, adopts a binding quota on imports of sugar.

1. The price of sugar in the United States
   a) rises
   b) falls
   c) remains the same
   d) a) or c)
   e) b) or c)

2. Who benefits in United States due to the quota?
   a) sugar producers
   b) sugar consumers
   c) government revenue
   d) a) and c)
   e) b) and c)

3. Who is hurt in the United States due to the quota?
   a) sugar producers
   b) sugar consumers
   c) government revenue
   d) a) and c)
   e) b) and c)

4. The price of sugar in the rest of the world
   a) rises
   b) falls
   c) remains the same
   d) a) or c)
   e) b) or c)
5-8. The United States, a large country, removes a subsidy on exports of steel.

5. The price of steel in the United States
   a) rises
   b) falls
   c) remains the same
   d) a) or c)
   e) b) or c)

6. Who in the United States benefits from removing the subsidy?
   a) steel producers
   b) steel consumers
   c) government revenue
   d) a) and c)
   e) b) and c)

7. The price of steel in the rest of the world
   a) rises
   b) falls
   c) remains the same
   d) a) or c)
   e) b) or c)

8. Who in the rest of the world benefits from removing the subsidy?
   a) steel producers
   b) steel consumers
   c) government revenue
   d) a) and c)
   e) b) and c)
FACTOR MOBILITY

9-12. The United States and Mexico produce houses using labor and land. Initially, Mexico has more workers per acre than the United States. Suppose the countries share the same technology. Consider the effects of allowing labor to move freely between the two countries.

9. The wage in the United States will
   a) rise
   b) fall
   c) remain unchanged
   d) a) or c)
   e) b) or c)

10. The wage in Mexico will
    a) rise
    b) fall
    c) remain unchanged
    d) a) or c)
    e) b) or c)

11. Land owners in the United States will be made
    a) better off
    b) worse off
    c) no better, no worse
    d) a) or c)
    e) b) or c)

12. Land owners in Mexico will be made
    a) better off
    b) worse off
    c) no better, no worse
    d) a) or c)
    e) b) or c)
FOREIGN DIRECT INVESTMENT

13-16 Honda (a Japanese company) is deciding how to serve the automobile market in the United States.

13. If there is ownership advantage, location advantage, and internalization advantage, what should Honda do?
   a) export cars to the United States
   b) establish a production subsidiary in the United States
   c) license a US firm to produce its cars
   d) stay out of the US market
   e) shut down entirely

14. If there is ownership advantage, location advantage, but no internalization advantage, what should Honda do?
   a) export cars to the United States
   b) establish a production subsidiary in the United States
   c) license a US firm to produce its cars
   d) stay out of the US market
   e) shut down entirely

15. If there is ownership advantage, internalization advantage, but no location advantage, what should Honda do?
   a) export cars to the United States
   b) establish a production subsidiary in the United States
   c) license a US firm to produce its cars
   d) stay out of the US market
   e) shut down entirely

16. If there is location advantage, internalization advantage, but no ownership advantage, what should Honda do?
   a) export cars to the United States
   b) establish a production subsidiary in the United States
   c) license a US firm to produce its cars
   d) stay out of the US market
   e) shut down entirely
TRADE POLICY PROBLEMS
In the United States (US), inverse demand for clothing is \( P = 18 - Q_{D} \), while inverse supply of clothing is \( P = 6 + Q_{S} \). In the rest of the world (ROW), inverse demand for clothing is \( P^{*} = 12 - Q_{D}^{*} \), while inverse supply of clothing is \( P^{*} = Q_{S}^{*} \).

1. Derive the US autarky price and quantity. Derive the US import demand (including slope-intercept form).

2. Derive the ROW autarky price and quantity. Derive the ROW export supply (including slope-intercept form).

3. Derive the free trade price and US imports under free trade. Derive US quantity demanded and quantity supplied under free trade.

4. Derive the US tariff-ridden import demand for a tariff \( T = 2 \) (including slope-intercept form). Derive the ROW price, the US price, and US imports with the tariff.

5. Derive US quantity demanded and quantity supplied with the tariff. Derive the change in consumer surplus, producer surplus, and government revenue in the United States due to the tariff.

6. Derive the US consumption distortion and production distortion. Derive the US efficiency loss and terms of trade gain. Derive the change in welfare in the United States due to the tariff. Is the United States better or worse off with the tariff?

WORLD MARKET GRAPH: US IMPORT DEMAND, ROW EXPORT SUPPLY, US TARIFF-RIDDEN IMPORT DEMAND

US MARKET GRAPH: US DEMAND, US SUPPLY
Indicate free trade price, US quantity demanded and quantity supplied under free trade, US tariff-ridden price, US quantity demanded and quantity supplied with the tariff, and ROW tariff-ridden price. Label areas corresponding to change in consumer surplus, change in producer surplus, change in government revenue, production distortion, consumption distortion, efficiency loss, and terms of trade gain.
Final Exam Solutions, Spring 2004

1a The price of sugar in the United States rises.
2a Sugar producers in the United States benefit.
3b Sugar consumers in the United States are hurt.
4b The price of sugar in the rest of the world falls.

5b The price of steel in the United States falls.
6e Steel consumers and government revenue in the United States benefit.
7a The price of wheat in the rest of the world rises.
8a Steel producers in the rest of the world benefit.

9b The wage in the United States will fall.
10a The wage in Mexico will rise.
11a Land owners in the United States will be made better off.
12b Land owners in Mexico will be made worse off.

13b If there is ownership advantage, location advantage, and internalization advantage, Honda should establish a production subsidiary in the United States.
14c If there is ownership advantage, location advantage, but no internalization advantage, Honda should license a US firm to produce its cars.
15a If there is ownership advantage, internalization advantage, but no location advantage, Honda should export cars to the United States.
16d If there is location advantage, internalization advantage, but no ownership advantage, Honda should stay out of the US market.
PROBLEMS
1. US autarky price and quantity
   \[ 18 - Q^A = 6 + Q^A \rightarrow 2Q^A = 12 \rightarrow Q^A = 6 \]
   \[ P^A = 18 - Q^A = 18 - 6 = 12 \]
   US import demand
   \[ P = 18 - Q^D \rightarrow Q^D = 18 - P \]
   \[ P = 6 + Q^S \rightarrow Q^S = -6 + P \]
   \[ M = D - S = Q^D - Q^S = 18 - P - (-6 + P) \]
   \[ M = 24 - 2P \rightarrow P = 12 - \frac{1}{2}Q_M \]
   Graph of US import demand

2. ROW autarky price and quantity
   \[ 12 - Q^{A*} = Q^{A*} \rightarrow 2Q^{A*} = 12 \rightarrow Q^{A*} = 6 \]
   \[ P^{A*} = 12 - Q^{A*} = 12 - 6 = 6 \]
   ROW export supply
   \[ P^* = Q^*_S \rightarrow Q^*_S = P^* \]
   \[ P^* = 12 - Q^*_D \rightarrow Q^*_D = 12 - P^* \]
   \[ X^* = S^* - D^* = Q^*_S - Q^*_D = P^* - (12 - P^*) \]
   \[ X^* = -12 + 2P^* \rightarrow P^* = 6 + \frac{1}{2}Q^*_X \]
   Graph of the ROW export supply
3. Free trade price
\[ M = X^* \rightarrow 24 - 2P = -12 + 2P^* \rightarrow 36 = 4P \rightarrow P = P^* = 9 \]

US quantity of imports
\[ M = 24 - 2P = 24 - 2(9) = 24 - 18 = 6 \]

US quantity demanded and quantity supplied
\[ P = 18 - Q_D \rightarrow 8 = 18 - Q_D \rightarrow D = Q_D = 18 - 9 = 9 \]
\[ P = 6 + Q_S \rightarrow 9 = 6 + Q_S \rightarrow S = Q_S = 9 - 6 = 3 \]

b) US tariff-ridden import demand
\[ M_T = 24 - 2P_T = 24 - 2(P_T^* + 2) = 24 - 2P_T^* - 4 \]
\[ M_T = 20 - 2P_T^* \rightarrow P_T^* = 10 - \frac{1}{2}Q_{M_T} \]

Graph of the tariff-ridden US import demand

ROW tariff-ridden price
\[ M_T = X^* \rightarrow 20 - 2P_T^* = -12 + 2P_T^* \rightarrow 32 = 4P_T^* \rightarrow P_T^* = 8 \]

US tariff-ridden price
\[ P_T = P_T^* + T = 8 + 2 = 10 \]

Tariff-ridden US quantity of imports
\[ M_T = 20 - 2P_T^* = 20 - 2(8) = 20 - 16 = 4 \]
5. **US tariff-ridden quantity demanded and quantity supplied**

\[ P^T = 18 - Q_D^T \rightarrow 10 = 18 - Q_D^T - D^T \equiv Q_D^T = 18 - 10 = 8 \]

\[ P^T = 6 + Q_S^T - 10 = 6 + Q_S^T - S^T \equiv Q_S^T = 10 - 6 = 4 \]

**US producer surplus increases by the area** \( a \)

\[ \Delta PS = (P_T - P) \left( \frac{S + S_T}{2} \right) = (10 - 9) \left( \frac{3 + 4}{2} \right) = 3.5 \]

**US consumer surplus decreases by the area** \( a + b + c + d \)

\[ \Delta CS = -(P_T - P) \left( \frac{D + D_T}{2} \right) = -(10 - 9) \left( \frac{9 + 8}{2} \right) = -8.5 \]

**US government revenue increases by the area** \( c + e \)

\[ \Delta GR = TM_T = 2 \times 4 = 8 \]

6. **US consumption distortion** is the area \( d \)

\[ d = \Delta P \left( \frac{\Delta D}{2} \right) = (10 - 9) \left( \frac{9 - 8}{2} \right) = \frac{1}{2} = 0.5 \]

**US production distortion** is the area \( b \)

\[ b = \Delta P \left( \frac{\Delta S}{2} \right) = (10 - 9) \left( \frac{4 - 3}{2} \right) = \frac{1}{2} = 0.5 \]

**US efficiency loss** is \( b + d = 0.5 + 0.5 = 1 \).

**US terms of trade gain** is area \( e \)

\[ e = (P - P^{*+})M_T = (9 - 8) \times 4 = 4 \]

The **US welfare gain** is \( e - (b + d) = 4 - 1 = 3 \) or

\[ \Delta W = \Delta CS + \Delta PS + \Delta GR = -8.5 + 3.5 + 8 = 3 \]

The United States is better off due to its tariff.
World Market

Quantity Traded

World Price

M

X*

M'

4

6

6

8

9

10

12