TRADE POLICIES

1-4  The United States, a large country, imposes a binding quota on imports of textiles from China.

1. The price of textiles in the United States
   a) rises
   b) remains the same
   c) falls
   d) remains the same or falls
   e) cannot tell from the information given

2. The price of textiles in China
   a) rises
   b) remains the same
   c) falls
   d) remains the same or rises
   e) cannot tell from the information given

3. Consumer surplus in the United States
   a) rises
   b) remains the same
   c) falls
   d) remains the same or rises
   e) cannot tell from the information given

4. Welfare in the United States
   a) rises
   b) remains the same
   c) falls
   d) remains the same or rises
   e) cannot tell from the information given
5-8. The United States, a large country, *removes* a specific subsidy on agricultural exports.

5. The price of agricultural products in the United States
   a) falls by more than the amount of the subsidy
   b) falls by exactly the amount of the subsidy
   c) falls by less than the amount of the subsidy
   d) remains the same
   e) rises

6. The price of agricultural products in the ROW
   a) rises by more than the amount of the subsidy
   b) rises by exactly the amount of the subsidy
   c) rises by less than the amount of the subsidy
   d) remains the same
   e) falls

7. Consumer surplus in the United States
   a) rises
   b) remains the same
   c) falls
   d) remains the same or falls
   e) cannot tell from the information given

8. Welfare in the United States
   a) rises
   b) remains the same
   c) falls
   d) remains the same or falls
   e) cannot tell from the information given
FACTOR MOBILITY

9-12. The United States and Mexico produce houses using labor and land. Initially, labor is scarce relative to land in the United States compared to Mexico. Suppose the countries share the same technology. Consider the effects of allowing labor to move freely between the two countries.

9. Who benefits in the United States?
   a) workers
   b) landowners
   c) workers and landowners
   d) neither workers nor landowners
   e) cannot tell from the information given

10. Who is hurt in the United States?
    a) workers
    b) landowners
    c) workers and landowners
    d) neither workers nor landowners
    e) cannot tell from the information given

11. Who benefits in Mexico?
    a) all workers, regardless of whether they leave or stay
    b) only workers who stay
    c) only workers who leave
    d) landowners
    e) landowners and workers who stay

12. Who is hurt in Mexico?
    a) all workers, regardless of whether they leave or stay
    b) only workers who stay
    c) only workers who leave
    d) landowners
    e) landowners and workers who stay
FOREIGN DIRECT INVESTMENT

13-16 A firm is deciding how to serve the market in India.

13. If the firm lacks ownership advantage, what mode will it choose?
   a) exports
   b) foreign direct investment
   c) licensing
   d) joint ventures
   e) stay out of Indian market

14. If there is no location advantage, what mode will the firm choose?
   a) exports
   b) foreign direct investment
   c) licensing
   d) outsourcing
   e) stay out of Indian market

15. If there is no internalization advantage, what mode will the firm choose?
   a) exports
   b) foreign direct investment
   c) licensing
   d) exports and foreign direct investment
   e) stay out of Indian market

16. If there are ownership, location, and internalization advantages, what mode will the firm choose?
   a) exports
   b) foreign direct investment
   c) licensing
   d) exports and licensing
   e) stay out of Indian market
TRADE POLICY PROBLEMS

In the United States (US), inverse demand for clothing is \( P = 74 - 2Q_D \), while inverse supply of clothing is \( P = 30 + 2Q_S \). In the rest of the world (ROW), inverse demand for clothing is \( P^* = 52 - 2Q_{D^*} \), while inverse supply of clothing is \( P^* = 2Q_{S^*} \).

1. Derive the US autarky price and quantity.

Derive the US import demand (including slope-intercept form).

Derive the ROW autarky price and quantity.

Derive the ROW export supply (including slope-intercept form).
2. Derive the free trade price and US imports under free trade.

Derive US quantity demanded and quantity supplied under free trade.

3. Derive the US tariff-ridden import demand for a specific tariff \( t = 6 \) (including slope-intercept form).

Derive the ROW price, the US price, and US imports with the tariff.

Derive US quantity demanded and quantity supplied with the tariff.

*How large of a tariff would the United States need to impose to prohibit all imports?*
4. Derive the change in consumer surplus, producer surplus, and government revenue in the United States due to the tariff (starting with the general equations and being sure to indicate the areas corresponding to each on the US graph).

5. Define and derive the US consumption distortion and production distortion.

Define and derive the US efficiency loss and terms of trade gain.

6. Derive the change in welfare in the United States due to the tariff. Confirm that the net welfare calculation yields the same answer.

Is the United States better or worse off with the tariff and why?
DRAW WORLD MARKET GRAPH HERE: US IMPORT DEMAND, ROW EXPORT SUPPLY, US TARIFF-RIDDEN IMPORT DEMAND

DRAW US MARKET GRAPH HERE: 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, Fall 2005

1a The price of textiles in the United States rises.
2c The price of textiles in China falls.
3c Consumer surplus in the United States falls due to the higher price.
4c Welfare in the United States falls due to consumption and production distortions (and transferring quota rents to foreign firms)
5c The price of agricultural products in the United States falls by less the amount of the subsidy.
6c The price of agricultural products in the ROW rises by less the amount of the subsidy.
7a Consumer surplus in the United States rises.
8a Welfare in the United States rises due to removing consumption and production distortions and avoiding terms of trade loss.
9b Landowners in the United States benefit.
10a Workers in the United States are hurt.
11a All workers, regardless of whether they leave or stay benefit in Mexico.
12d Landowners in Mexico are hurt.
13e Without ownership advantage, the firm will stay out of the Indian market.
14a Without location advantage, the firm will choose exports.
15c Without internalization advantage, the firm will choose licensing.
16b With ownership, location, and internalization advantage, the firm will choose foreign direct investment.
PROBLEMS
1 Derive US autarky price and quantity.

\[ 74 - 2Q^A = 30 + 2Q^A, \quad 4Q^A = 44, \quad Q^A = 11 \]
\[ P^A = 74 - 2Q^A = 74 - 22 = 52 \]

Derive the US import demand (including slope-intercept form).

\[ P = 74 - 2Q_D, \quad Q_D = 37 - \frac{1}{2}P \]
\[ P = 30 + 2Q_S, \quad Q_S = -15 + \frac{1}{2}P \]
\[ M = D - S = Q_D - Q_S = 37 - \frac{1}{2}P - \left(-15 + \frac{1}{2}P\right) \]
\[ M = 52 - P, \quad P = 52 - Q_M \]

Derive the ROW autarky price and quantity.

\[ 52 - 2Q^{A*} = 2Q^{A*}, \quad 4Q^{A*} = 52, \quad Q^{A*} = 13 \]
\[ P^{A*} = 52 - 2Q^{A*} = 52 - 26 = 26 \]

Derive the ROW export supply (including slope-intercept form).

\[ P^* = 2Q_S^*, \quad Q_S^* = \frac{1}{2}P^* \]
\[ P^* = 52 - 2Q_D^*, \quad Q_D^* = 26 - \frac{1}{2}P^* \]
\[ X^* = S^* - D^* = Q_S^* - Q_D^* = \frac{1}{2}P^* - \left(26 - \frac{1}{2}P^*\right) \]
\[ X^* = -26 + P^*, \quad P^* = 26 + Q_X^* \]
2. Derive the free trade price and US imports under free trade.

\[ M = X^*, \quad 52 - P = -26 + P^*, \quad 78 = 2P, \quad P = P^* = 39 \]
\[ M = 52 - P = 52 - 39 = 13 \]

Derive US quantity demanded and quantity supplied under free trade.

\[ P = 74 - 2Q_D, \quad 39 = 74 - 2Q_D, \quad D = Q_D = \frac{35}{2} = 17.5 \]
\[ P = 30 + 2Q_S, \quad 39 = 30 + 2Q_S, \quad S = Q_S = \frac{9}{2} = 4.5 \]

3. Derive the US tariff-ripped import demand for a specific tariff \( t = 6 \) (including slope-intercept form).

\[ M_T = 52 - P_T = 52 - (P_T^* + 6), \quad M_T = 46 - P_T^*, \quad P_T^* = 46 - Q_{M_T} \]

Derive the ROW price, the US price, and US imports with the tariff.

\[ M_T = X^*, \quad 46 - P_T^* = -26 + P_T^*, \quad 72 = 2P_T^*, \quad P_T^* = 36 \]
\[ P_T = P_T^* + t = 36 + 6 = 42 \]
\[ M_T = 46 - P_T^* = 46 - 36 = 10 \]

Derive US quantity demanded and quantity supplied with the tariff.

\[ P_T = 74 - 2Q_D^T, \quad 42 = 74 - 2Q_D^T, \quad D^T = Q_D^T = \frac{32}{2} = 16 \]
\[ P_T = 30 + 2Q_S^T, \quad 42 = 30 + 2Q_S^T, \quad S^T = Q_S^T = \frac{12}{2} = 6 \]

How large of a tariff would the United States need to impose to prohibit all imports?

\[ t' = P^A - P^A^* = 52 - 26 = 26 \]
4. Derive the change in consumer surplus, producer surplus, and government revenue in the United States due to the tariff.

\[ \Delta CS = -abcd = -(P_T - P) \left( \frac{D + D_T}{2} \right) = -(42 - 39) \left( \frac{17.5 + 16}{2} \right) = -50.25 \]

\[ \Delta PS = a = (P_T - P) \left( \frac{S + S_T}{2} \right) = (42 - 39) \left( \frac{4.5 + 6}{2} \right) = 15.75 \]

\[ \Delta GR = ce = TM_T = 6(10) = 60 \]

5. Define and derive the US consumption distortion and production distortion.

Consumption distortion is loss due to too little consumption (some units not consumed where value above free trade price).

\[ d = \Delta P \left( \frac{\Delta D}{2} \right) = (42 - 39) \left( \frac{17.5 - 16}{2} \right) = 2.25 \]

Production distortion is loss due to too much production (some units produced at cost above free trade price).

\[ b = \Delta P \left( \frac{\Delta S}{2} \right) = (42 - 39) \left( \frac{6 - 4.5}{2} \right) = 2.25 \]

Define and derive the US efficiency loss and terms of trade gain.

Efficiency loss is size of total distortion, consumption plus production.

\[ b + d = 2.25 + 2.25 = 4.5 \]

Terms of trade gain is degree that buy imports cheaper.

\[ e = (P - P^T)M_T = (39 - 36)(10) = 30 \]

6. Derive the change in welfare in the United States due to the tariff. Confirm that the net welfare calculation yields the same answer.

\[ \Delta W = \Delta CS + \Delta PS + \Delta GR = -50.25 + 15.75 + 60 = 25.5 \]

\[ e-(b+d) = 30 - 4.5 = 25.5 \]

Is the United States is better or worse off due to the tariff and why?

Better. The terms of trade gain outweighs the efficiency loss for large country starting from free trade.