

Note to fall 2006 students: This exam covers some material that has not yet been introduced this year, including trade with imperfect competition (problems 1 and 2). Obviously you are not yet responsible for it.

**Economics 433: Advanced International Trade**

**Second Midterm Exam**

November 3, 2005

Professor Tybout

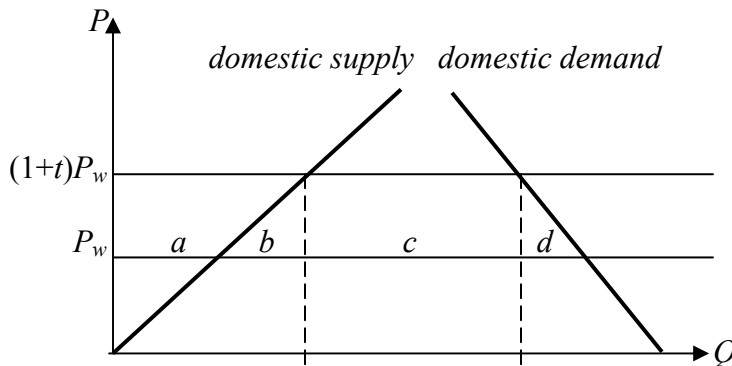
**Answer Key**

Each section will be weighted in proportion to its allotted time. Please read the questions carefully, and provide concise explanations when then are solicited. There is no penalty for guessing, and partial credit will be awarded, so be sure to attempt all questions.

Be sure to show your work.

**Part I: Multiple Choice (20 minutes)**

- 1) If a country wishes to encourage production in the software industry, perhaps because it generates public knowledge, which type of policy is best from a welfare perspective?
  - a. A tariff on imports of software.
  - b. A quota on imports of software.
  - c. A subsidy for consumption of software.
  - d. A subsidy for production of software.**
  
- 2) According to U.S. law, a foreign producer is guilty of dumping if
  - a. it is selling its product in the U.S. market at a price above the price it charges in its home market.
  - b. it is selling its product in the U.S. market at a price below its marginal production costs.
  - c. it is selling its product in the U.S. market at a price below its average production costs.**
  - d. it sells its product at a price below the price charged for a comparable product by a U.S. producer.
  
- 3) Tests of the factor content theorem reveal that:
  - a. countries tend to export their scarce factors.
  - b. globally, there is far less trade in factors than predicted by the theory.**
  - c. Canada and the U.S. trade far more than predicted by theory.
  - d. all countries are trying to export their lawyers.
  
- 4) The diagram below depicts the domestic market for tomatoes in the presence of a tariff. The world price of tomatoes is identified as  $P_w$ , and the tariff rate is  $t$ :

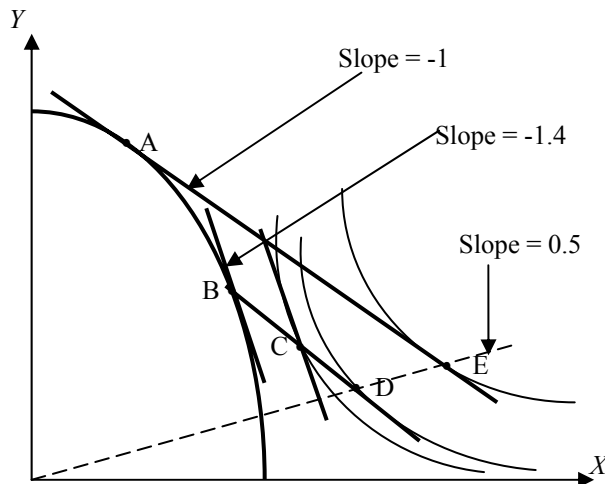


Which of the following statements concerning this diagram is correct?

- a. The tariff generates revenues for the domestic government represented by area c.**
- b. The area  $a+b+c+d$  represents the deadweight loss to the economy induced by the tariff.
- c. The tariff has driven up the world price of tomatoes.
- d. Relative to free trade, this tariff has discouraged some domestic production.

- 5) According to the study discussed in class, the multilateral trade policy reforms negotiated during the Uruguay Round:
- benefited the low income countries, at the expense of the high income countries.
  - benefited the low income countries at the expense of the high income countries.
  - increased global income by a modest (less than 1 percent) amount.**
  - reduced the real income by a modest (less than 1 percent) amount.

The following two questions refer to the graph below, which depicts the effect of a tariff on imports of good X:

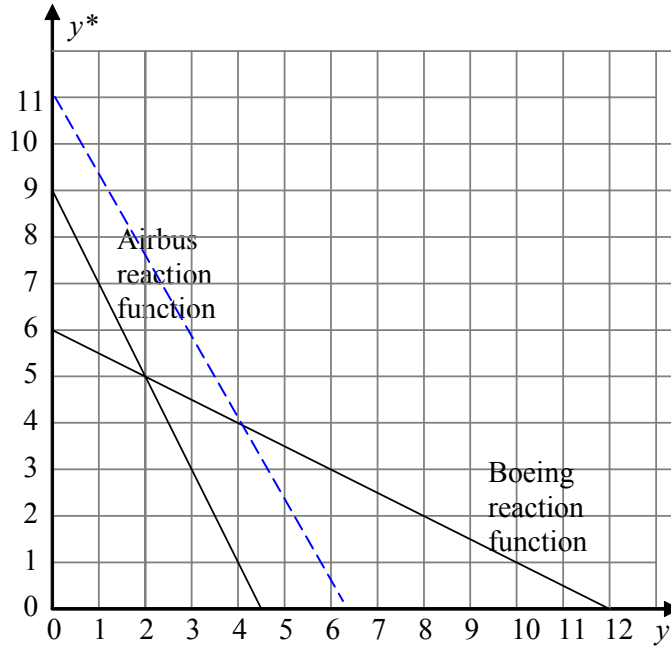


- 6) What tariff rate is consistent with the indicated slopes?
- 10 percent
  - 20 percent
  - 40 percent**
  - 50 percent
  - none of the above
- 7) Which of the following statements concerning the graph is *incorrect*?
- The tariff encouraged production of X
  - A tax on consumption of Y could have been used to generate the same adjustment in X production.**
  - The welfare effects of the tariff are represented by the movement from the indifference curve passing through E to the indifference curve passing through C.
  - The tariff induced consumers to consume more Y per unit X.
- 8) Which statement about workers displaced by import competition in the U.S. is *not* correct?
- Those that take advantage of the Trade Adjustment Assistance program find much better jobs than those that simply re-enter the job market.**
  - When they find re-employment, their wages are typically lower.
  - It takes them a bit longer to find another job than other displaced workers.
  - Compared to the overall labor force, they are relatively uneducated.

- 9) The United States has recently re-imposed quotas on apparel imports. Which of the following statements concerning this policy is *incorrect*?
- The quotas are an example of “escape clause” (section 201) protection.
  - The quotas are not inconsistent with the U.S.’s obligations as a member of the World Trade Organization.
  - The quotas put the U.S. at odds with the European Union, which has refrained from limiting imports of apparel from China.**
  - The quotas were a reaction to the surge of imports that occurred when the phase-out of the Multifiber Arrangement (MFA) was completed.
- 10) A large country with a comparative advantage in good Y is debating whether to impose an export tax on good Y or an import tariff on good X. Which of the following statements comparing these policies is correct?
- An export tax puts downward pressure on the global relative price of X,  $P_x^W / P_y^W$ , while an import tariff puts upward pressure on this relative price.
  - An export tax on Y encourages Y production, while an import tariff on X encourages X production.
  - An export tax on Y discourages domestic consumption of Y, while an import tariff on X discourages domestic consumption of X.
  - Qualitatively, an export tax on Y has the same effects on domestic production, consumption and government revenues as an import tariff on X.**

**Part II: Problems and Short Answers (55 minutes)**

- 1) (15 minutes) Airbus and Boeing produce identical airplanes, which they supply on global markets. Suppose they are Cournot competitors, and their reaction functions are as depicted below.



- a. Briefly explain what a reaction function is, and why the point (2, 5) in the diagram represents an equilibrium.

**Answer:**

- 1) Reaction functions show the output that maximizes a firm's profits, given the output produced by the other firm.
- 2) Point (2,5) is an equilibrium because each firm maximizes its profits by producing output at that point given that the other firm produces at that point as well. Since neither firm has an incentive to deviate, given that the other firm does not deviate, that point is an equilibrium.

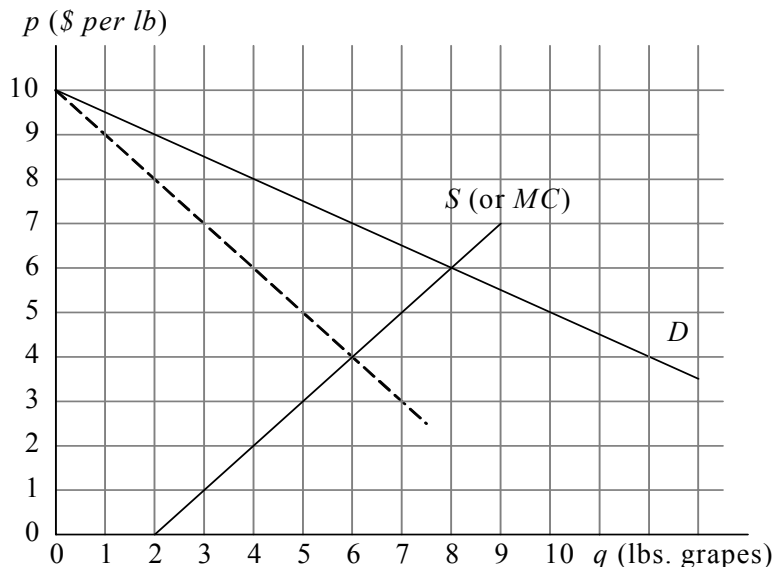
- b. Suppose the Europeans decide to subsidize Airbus production. How will this change the equilibrium? Modify the graph above in a way that *qualitatively* reflects such a subsidy. (refer to the dotted blue line on the diagram) (You would need more information to be able to precisely characterize the effects of the subsidy.) How will the subsidy affect Airbus production? (up, down, no change, ambiguous) **Up.** Boeing production? (up, down, no change, ambiguous) **Down.** The price of new aircraft? (up, down, no change, ambiguous) **Down.**

- c. During the recent past, has the U.S. accused the Europeans of subsidizing production costs or product development costs? Briefly describe the accusation.

**Answer:**

- 1) The U.S. accused the Europeans of subsidizing development costs.
- 2) The U.S. accused the Europeans of giving the Airbus a loan at an interest rate that does not reflect the risks of the project the loan is intended for. Moreover, the U.S. thought that loan was actually a subsidy because the project was not commercially viable and that Airbus would not be able to repay a loan within 17 years. (For greater details see Pavcnik, Nina. "Trade Disputes in the Commercial Aircraft Industry," *The World Economy*, May 2002, pp. 733-751 online pp. 743-745).

- 2) **(15 minutes)** The domestic supply and demand for grapes in a small country are depicted below. The world price per pound of grapes is \$4, but trade is not free. The economy maintains a 25 percent tariff ( $t = 0.25$ ) on grape imports.

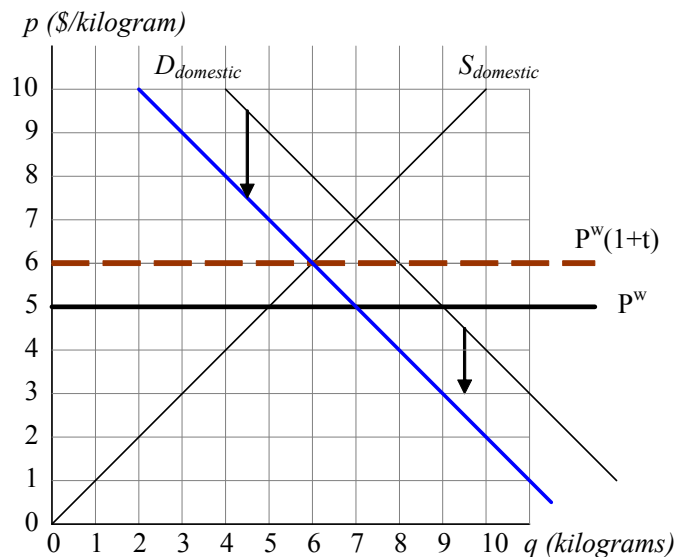


- a. For the moment assume that this market is competitive, and populated by many producers. The sum of their individual supply schedules is the market-wide schedule labeled  $S$ . (Ignore the dashed line and the “or  $MC$ ” label.) Relative to the hypothetical free trade equilibrium, calculate the *change* in consumer surplus induced by the tariff **-11** and the change in domestic producer surplus induced by the tariff **6.5**. Finally, calculate tariff revenues for the government **3**. Does the tariff induce deadweight loss? (yes, no) **Yes**. If so, how much? **1.5**
- b. What quota on grape imports (in pounds) would have led to the same domestic price and consumption volume as the tariff? **3 lbs.** If the government were to auction off this volume of import licenses to the highest bidder, how much revenue would the auction generate? **\$3.**

- c. Now suppose that a grape mogul buys up all of the domestic grape suppliers, converting the industry supply schedule to a domestic monopolist's marginal cost schedule. (Note that, in the absence of foreign competition, the dotted line becomes the monopolist's marginal revenue curve.) To characterize the new equilibrium when trade is prohibited, when trade is free, and when a 25 percent tariff is imposed, complete the table below.

	Imports prohibited	Free trade	Trade with 25 percent tariff
Domestic price:	7	4	5
Monopolist sells (lbs):	6	6	7
Consumers import (lbs):	0	6	3

3. (10 minutes) The graph below shows domestic supply (S) and demand (D) for steel in a small country. Suppose that this country faces a world price of \$5 per kilogram of steel, and that there is a 20 % tariff on steel imports.



- a) Using the grid lines in the figure to calculate the quantities supplied **6**, demanded **8**, and imported **2** after the tariff is imposed. What is the domestic price? **6**. What quota would have had the same effect on each of these variables? Quota = **2**.
- b) Continue to assume that the 20 percent tariff is in effect. But now suppose that falling demand for skyscrapers shift the domestic demand curve for steel downward by 2 units. What is the new quantity of steel supplied domestically? **6** Consumed? **6** Imported? **0** What is the new domestic price of steel? **6**.
- c) Now assume that instead of a 20 percent tariff, the government protects steel by imposing the quota you found in part (a). Once more, suppose that falling demand for skyscrapers shift the domestic demand curve downward by 2 units relative to curve that appears in the graph. What is the new quantity of steel supplied domestically? **5**. Consumed? **7**. imported? **2**. What is the new domestic price of steel? **5**.

- d) If the government wishes to keep domestic prices from responding to domestic demand shocks, should it use tariffs or quotas to protect steel? **Tariff**. If it wishes to keep domestic prices from responding to fluctuations in foreign prices, which type of protection should it use? **Quota**. Briefly explain.

**Explanations:**

a) As long as the world price plus tariff remains below the equilibrium price in the autarky the changes in the demand will not affect domestic price because local consumers can buy any amount from world at a world price and pay a tariff to bring good into a country.

b) As long as the quota remains binding, any changes in the foreign prices will not affect the domestic price. What matters for the domestic price is the total quantity supplied given a particular demand. If the supply from abroad is restricted by quota it is unaffected by world price so long as the quota remains binding.

4. (15 minutes) Suppose the global economy satisfies the assumptions of the Heckscher-Ohlin model. Further, there are two goods in the world—food and cars—and all countries use the quantities of capital and labor per unit of output listed in the table below.

Factor requirements per unit output		
	Food	Cars
Labor	$a_{LF} = 4$	$a_{LC} = 1$
Capital	$a_{KF} = 1$	$a_{KC} = 5$

- a) The country of Moca Boca is exporting 10 units of food, and importing 5 cars. Calculate the factor content of its exports and imports. Then determine the net labor content and the net capital content of this country's trade. (Use negative numbers to indicate net imports and positive numbers to indicate net exports.)

	Food exports (10 units)	Car imports (5 units)	Net factor content of trade
Labor content	<b>40</b>	<b>-5</b>	<b>35</b>
Capital content	<b>10</b>	<b>-25</b>	<b>-15</b>

- b) If the Factor Content theorem is correct, is this country relatively abundant in labor or in capital? **Labor, because the country is a net exporter of labor.**

- c) Global factor endowments and Moca Boca's factor endowments are given in the table below. Also, Moca Boca generates 10 percent of world income. What does the Factor Content Theorem predict about the factor content of Moca Boca's trade? Fill in the last column in the table below.

	Global Endowment	Moca Boca endowment	Predicted net factor content of Moca Boca's trade
Labor	2,000	250	<b>+50</b>
Capital	1,000	80	<b>-20</b>

Calculations:

- a)  $50 = 250 - 0.1 * 2000$ ;  
 b)  $-20 = 80 - 0.1 * 1000$ ;

- d) Are the data provided in this problem consistent with the Factor Content Theorem? **No**  
 Drawing on the numbers you have calculated for parts a and c, briefly defend your answer.

**Defense:**

From a we can know the actual amounts of factors imported and exported and from (c) we see that these amounts are not equal to those predicted by the Factor content theorem ( c ). Hence, the data is not strictly consistent with the Factor content theorem. However, this theorem correctly predicts the direction of trade, so it is qualitatively correct, given these numbers. Note that the theory over-predicts factor trade volumes, just as actual studies have found.