

Name: \_\_\_\_\_

due Thursday, April 2nd, 2009

### Exercise No. 4: Trade and Policy in Economic Development

You have been hired by the U.S. Agency for International Development to study the causes of poverty in the Republic of Typica, a low-income country in Asia. You are asked to focus on the cotton and cloth industry. Currently, about half of all raw cotton grown in this country is exported, while about half of all manufactured cloth is imported. Politicians in Typica have argued that this "dependence" on foreign cloth production is why the country is poor, and that the government must try to "keep the cotton in the country" and "create more high-paying jobs" in cloth manufacturing.

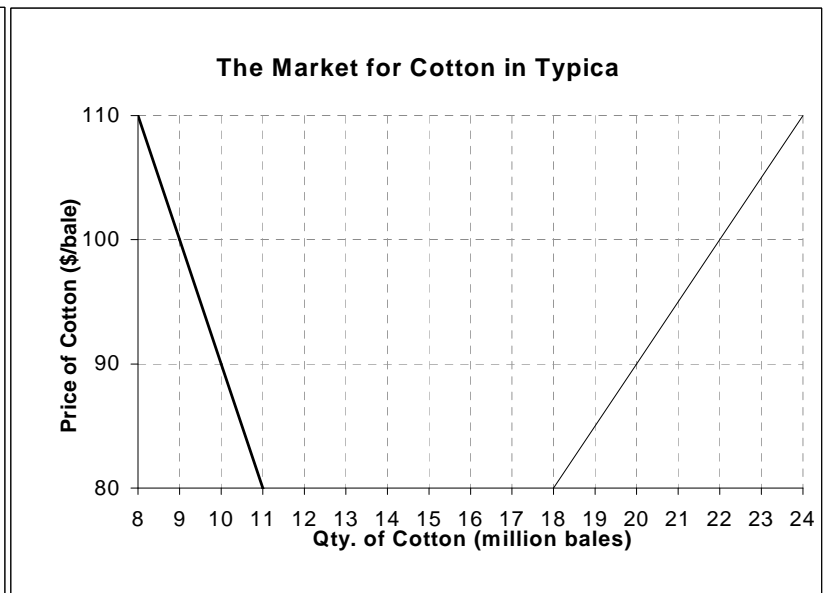
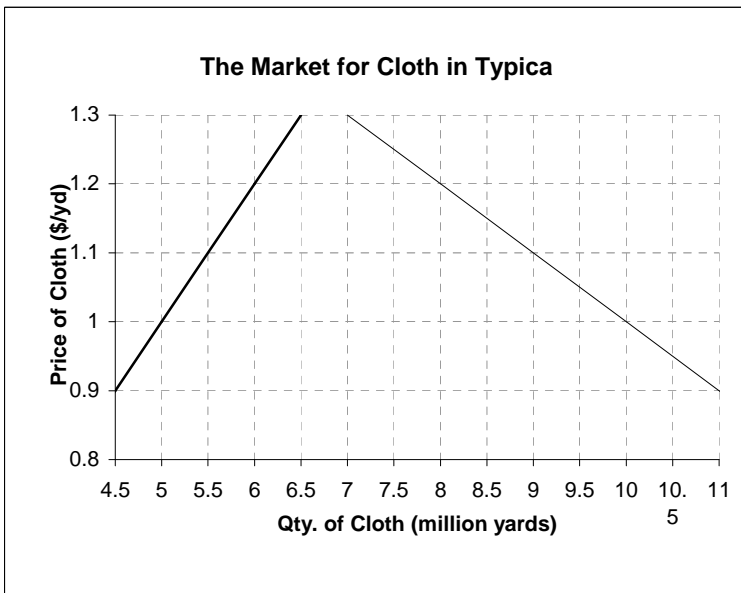
Because of these arguments, government restricts trade with tariffs on cloth imports and taxes on cotton exports. To analyze the impact of the government's policy, you begin with the following estimates of current prices and quantities, *with the import tariff & export tax in place*:

	Cloth	Cotton
Domestic price (Pd)	1.10 \$/yd	90 \$/bale
Qty. supplied (Qs)	5.5 million yards	20 million bales
Qty. demanded (Qd)	9.0 million yards	10 million bales
Qty. traded (M or X)	3.5 million yards (Imports)	10 million bales (Exports)

Then, to estimate the effects of the import tariff & export tax, you must estimate what conditions would be like without them. For this you need to estimate slopes of the supply and demand curves, the tariff/tax levels and world prices, which you find to be as follows:

	Cloth	Cotton
Import tariff or export tax (t)	0.10 \$/yd	10 \$/bale
World price (Pw)	1.00 \$/yd	100 \$/bale
Slope of sup. curve	0.2 (1/5)	5 (5/1)
Slope of dem. curve	-0.1 (-1/10)	-10 (-10/1)

(1) You use this information to draw supply-demand diagrams for each market. Draw circles around the points on each supply and demand curve which **you now observe**, and then draw squares around the points **you would observe without the government's tariff or tax**.



(2) Use the above supply-demand diagrams to calculate numbers for the following table, by subtracting the values for the situation *without restrictions* from the current situation *with restrictions*. In the bottom row, use a plus or minus sign in front of the number to show if the effect of the restriction is to increase or decrease the quantity by that amount.

	Quantity of Cloth (millions of yards)			Quantity of Cotton (millions of bales)		
	Produced	Consumed	Traded	Produced	Consumed	Traded
Qties. observed <i>with</i> tariff or tax (circles)						
Minus quantities <i>without</i> tariff or tax (squares)						
= Change caused by tariff or tax (+ or -)						

(3) Now, use the supply-demand diagram and the worksheet on the following page to calculate the monetary value of the *change in economic surplus* caused by policy, as the tariff and tax causes people to move from the squares to the circles. Again use a plus or minus sign in front of the value to show whether the policy causes a gain (+) or a loss (-) for each group, and then sum up the gains and losses horizontally across market participants to determine the total national gain or loss.

	Producer surplus	Consumer surplus	Gov't. revenue	Total change in econ. surplus*
<b>In the cloth market</b> Gain (+) or loss (-) from tariff or tax				
<b>In the cotton market</b> Gain (+) or loss (-) from tariff or tax				

\* Note that the total change in economic surplus is the sum of changes in producer surplus, consumer surplus and government revenue.

- (3) As you try to make sense of these results, you learn that:
- national income is about \$500 million per year
  - there are only 20 cloth manufacturers in the country with a total of 2,000 employees, and the biggest companies are owned by prominent families with relatives in government;
  - there are about a million cotton growers who are mostly illiterate peasants; and
  - the government is in a serious budget crisis because it has been unable to impose any kind of income or property tax to finance spending on education, defence, etc.

Using this information, complete the following sentences.

- (i) The total amount of economic surplus lost due to current trade policy in the cotton and cloth markets is \$ \_\_\_\_\_ million which is equivalent to \_\_\_\_\_ percent of national income.
- (ii) The average producer surplus gain from the cloth import tariff, plus the consumer surplus gain from the cotton export tax, for each company manufacturing cloth is \_\_\_\_\_ per company, and \_\_\_\_\_ per employee.
- (iii) The average producer surplus loss from the cotton export tax for each cotton farmer is \_\_\_\_\_ per farmer.

### Economic Surplus Worksheet for Calculating Table 2

To help you complete Table 2 on the previous page, you can use this worksheet to calculate the changes in producer surplus, consumer surplus and government revenue caused by the tariff and taxes.

First, note that the changes in producers' (or consumers) surplus are the areas between the two price lines up to the supply (or demand) curve, *starting from the Y axis* (where quantity is zero). This area is a **rectangle** whose height is the tax or tariff, and whose length is from zero to the lower quantity, **plus a triangle** whose height is the tax or tariff and whose length is the change in quantity caused by the tax or tariff.

Second, note that the change in "government revenue" is the rectangle whose height is the tax or tariff revenue per unit, times the number of units traded when the tax is in place.

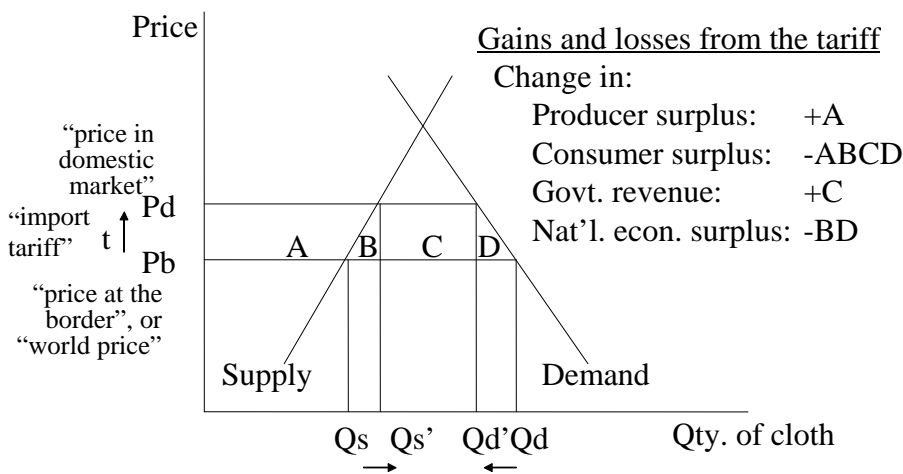
Third, note that only the total change in producers' surplus, consumers' surplus and government revenue need to be carried over to Table 2, where they will be summed together to calculate the total change in economic surplus.

<b>Table 3. Worksheet on economic surplus gains or losses from trade restrictions</b>				
		Producers Surplus	Consumers Surplus	Gov't. Revenue
<b>In the cloth market</b>	+ area of rectangle (height x length)			
	+ area of triangle (1/2 height x length)			
	= total change (rectangle + triangle)			
<b>In the cotton market</b>	+ area of rectangle (height x length)			
	+ area of triangle (1/2 height x length)			
	= total change (rectangle + triangle)			

**Economic surplus diagrams to illustrate the effects of a tariff on imports (cloth) and a tax on exports (cotton)**

Note: All of the areas marked “A” start at the Y axis, where quantity is zero!

*Effects of a tariff on imports (e.g. cloth in Typica)*



*Effects of a tax on exports (e.g. cotton in Typica)*

