

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.

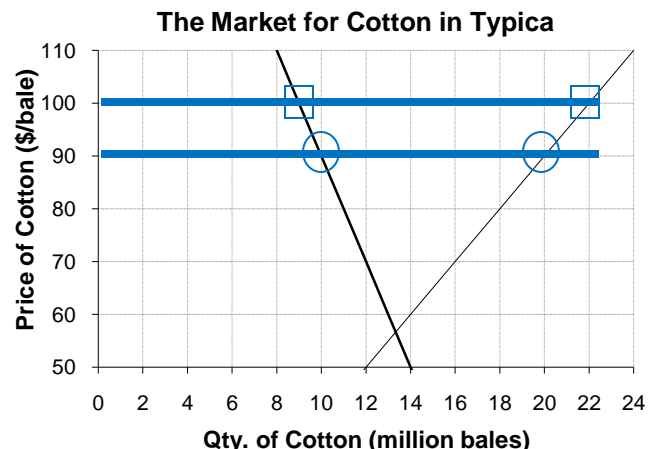
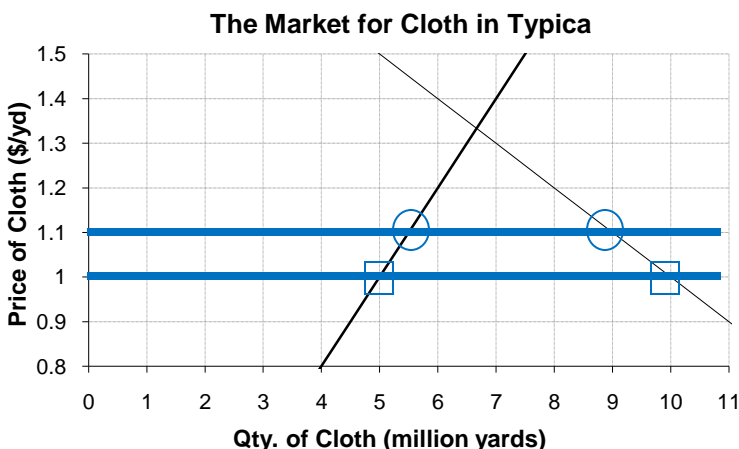
Because of these arguments, government restricts trade with tariffs on cloth imports and taxes on cotton exports. To analyze the impact of the government's policy, you begin with the following estimates of current prices and quantities, *with the import tariff & export tax in place*:

	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) Now, you begin your analysis by focusing on *quantities produced, consumed and traded*. Use the supply-demand diagrams on the previous page to calculate numbers for the following table, by subtracting your estimate of what quantities would be *without restrictions* from the observed quantities *with restrictions*. In the bottom row, show the net effect of the restriction by using a plus (+) or minus (-) sign in front of the change in quantity.

	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)	5.5	9.0	3.5	20	10	10
Minus quantities <i>without</i> tariff or tax (squares)	5.0	10.0	5.0	22	9	13
= Change caused by tariff or tax (+ or -)	+0.5	-1.0	-1.5	-2	+1	-3

(3) Your next task is to calculate the *monetary value of the change in economic surplus* caused by the policy, as the tariff and tax causes people to move along their supply and demand curves from the squares to the circles. To do this, note that the changes in economic surplus are the areas between the two price lines, over the entire quantity from zero to the supply curve (for producer surplus) or demand curve (for consumer surplus). Table 2 below helps you calculate this, by dividing each area into 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, **which sum to the total change in producer or consumer surplus**. The change in government revenue is just a rectangle, whose height is the tax or tariff revenue per unit, times the number of units traded with the tax in place.

		Producers Surplus	Consumers Surplus	Gov't. Revenue
In the cloth market	+ area of rectangle (height x length)	$0.1 \times 5 = 0.5$	$0.1 \times 9 = 0.9$	0.1×3.5
	+ area of triangle (1/2 height x length)	$\frac{1}{2} \times 0.1 \times 0.5 = 0.025$	$\frac{1}{2} \times 0.1 \times 1 = 0.05$	
	= total change (in absolute value)	0.525	0.95	0.35
In the cotton market	+ area of rectangle (height x length)	$10 \times 20 = 200$	$10 \times 9 = 90$	10×10
	+ area of triangle (1/2 height x length)	$\frac{1}{2} \times 10 \times 2 = 10$	$\frac{1}{2} \times 10 \times 1 = 5$	
	= total change (in absolute value)	210	95	100

(4) Finally, use Table 3 below to summarize the economic-surplus changes shown on Table 2. 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 sum up the gains and losses horizontally across market participants to determine the total national economic-surplus gain or loss.

Table 3. Economic surplus gains or losses due to trade restrictions (US\$ millions)				
	Producer surplus	Consumer surplus	Gov't. revenue	Total national econ. surplus*
In the cloth market Gain (+) or loss (-) from tariff or tax	+0.525	-0.95	+0.35	-0.075
In the cotton market Gain (+) or loss (-) from tariff or tax	-210	+95	+100	-15

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

- (5) 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 \$ 15.075 million which is equivalent to 3.015 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 \$ 4.78 m. per company, and \$ 47,800 per employee.
- (iii) The average producer surplus loss from the cotton export tax for each cotton farmer is \$ 210 per farmer.