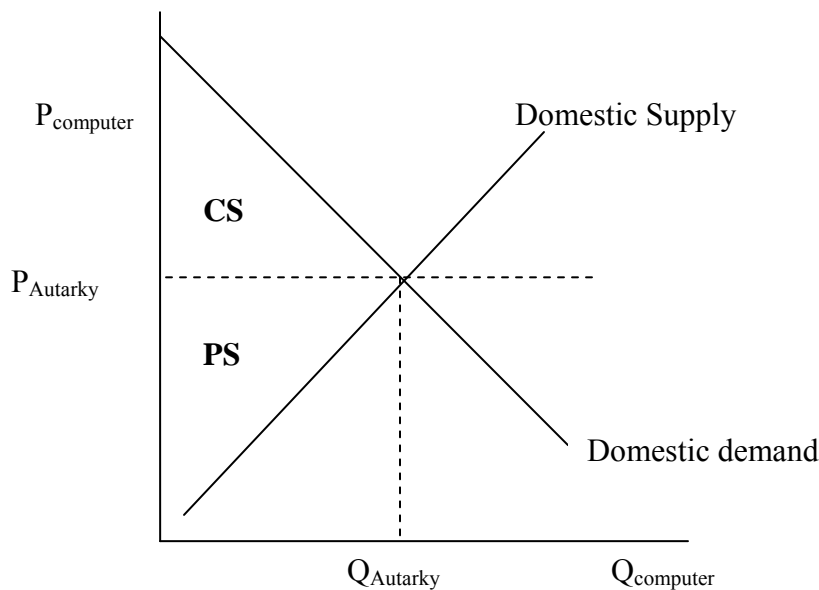


There are two goods: computers and bananas. Both use labor and another factor that is specific to that sector (computer fabrication plants, and land suitable for banana plantations).

Compared to the rest of the world, Guatemala is relatively abundant in land suitable for banana plantations (i.e. Guatemala has few computer plants and lots of banana growing land, while the rest of the world has lots of computer plants and little banana growing land.)

Finally, Guatemala is a very small country. This means that world prices for computers and bananas are unaffected by changes in Guatemala's supply and demand for these goods. Initially these prices are: computer = \$1000. bunch of bananas = \$10.

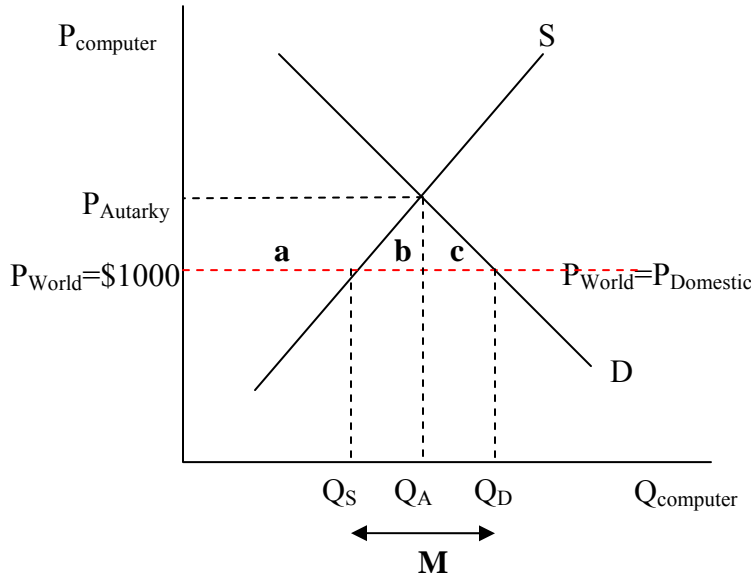
1. (10 pts) Suppose Guatemala has extremely high tariffs and so is in autarky. Draw a partial equilibrium supply-demand diagram for computers in Guatemala. Label consumer surplus and producer surplus.



Consumer Surplus (CS) is the area under the demand curve and above the autarky price ($P_{Autarky}$). Producer Surplus (PS) is the area under the $P_{Autarky}$ and above the supply curve.

2. (15 pts) Suppose Guatemala drops all its tariffs to zero. Redraw the graph above, and include the world price for computers.

Note that we have a specific factor model. Guatemala has a comparative advantage in bananas and a comparative disadvantage in computers. This means that Guatemala's autarky price ($P_{Autarky}$) of bananas is less than the free trade price (P_{World}), and the autarky price of computers is greater than the free trade price.



a. What is the new price of computers in Guatemala?

$$P_{World} = P_{Domestic} = \$1000$$

b. Show how domestic output and domestic demand for computers have changed. Show the quantity of imports.

$$\begin{aligned} \text{Domestic output decreased: } & Q_A \rightarrow Q_S \\ \text{Domestic demand increased: } & Q_A \rightarrow Q_D \\ \text{Quantity of imports: } & (Q_D - Q_S) = M \end{aligned}$$

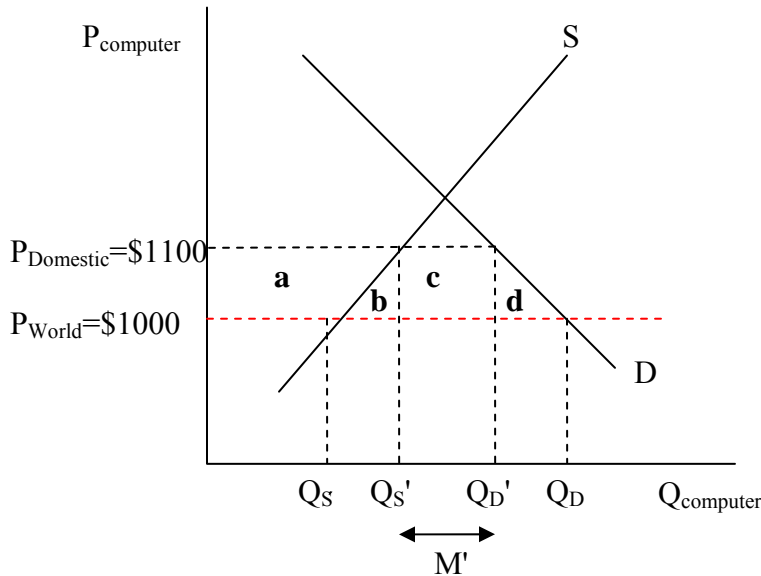
c. How have consumer surplus, producer surplus, and tariff revenue (if any) in the computer sector changed as a result of the move from autarky to free trade?

$$\begin{aligned} \text{CS increased by } & (a+b+c) \\ \text{PS decreased by } & a \\ \text{Tariff revenue has not changed (tariff revenue = quantity of imports} & \times \text{tariff. In autarky} \\ \text{the quantity of imports = 0; with free trade the tariff is zero)} & \end{aligned}$$

d. How is aggregate welfare in the economy affected by the move from autarky to free trade?

Aggregate (social) welfare increased by (b+c)

3. (15 pts) Redraw the graph in 2, and now have Guatemala place a specific tariff = \$100 per computer.



a. What is the new price of computers in Guatemala?

$$P_{\text{Domestic}} = (P_{\text{World}} + \text{tariff}) = \$1100$$

b. Show how domestic output and domestic demand for computers have changed. Show the quantity of imports.

Domestic output increased: $Q_S \rightarrow Q_{S'}$

Domestic demand decreased: $Q_D \rightarrow Q_{D'}$

Quantity of imports: $(Q_{D'} - Q_{S'}) = M'$ (smaller than M in Q.2)

c. How have consumer surplus, producer surplus, and tariff revenue (if any) in the computer sector changed as a result of the move from a zero tariff to a specific tariff = \$100?

CS decreased by (a+b+c+d)

PS increased by a

Tariff revenue increased by c

d. How is aggregate welfare in the economy affected by imposing the tariff?

Aggregate welfare decreased by (b+d)

4. (10 pts) Is the tariff surprising from the perspective of a “median voter” theory of trade policy? Why or why not?

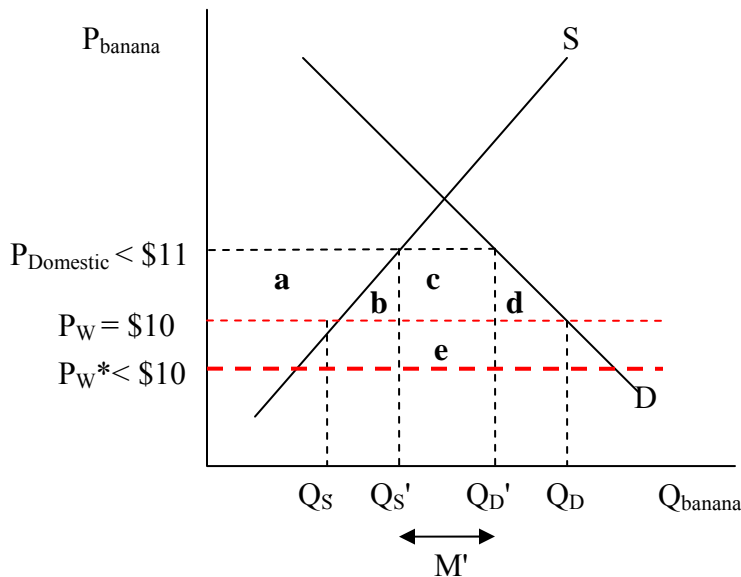
Yes, it’s surprising. A median voter theory says you can line people up according to their policy preferences (here, whether they like or dislike the tariff), and the majority opinion wins. So if the middle or median person dislikes the tariff there should be no tariff. In this case, the tariff generates gains for a small number of people (computer plant owners and perhaps computer workers in Guatemala) while generating losses for a large number of people (all consumers)

5. (10 pts) In Guatemala...

a. What happens to the return on investment in computer fabrication plants relative to the return on investment in banana plantations?

Since P_{Computer} is increasing (by tariff) and MPK_{Computer} is increasing (labor moves to computer sector out of banana sector), return on investment in computer is rising. While, return on investment in banana is decreasing since MPK_{Banana} is decreasing. Thus, relative return on investment in computer is increasing.

Same model (computers, bananas) but now look at this from the perspective of the US. The US is abundant in computer fabrication plants relative to banana plantation land. It is also a large country, so that changes in its supply and demand can move world prices.



6. (10 pts) Starting from free trade, the US places a specific tariff of \$1 on bananas.

a. Does the world price of bananas go up? Down? Stay unchanged? Why?

The tariff increases the US domestic banana price, lowering demand for bananas in the US. Since US is a “big” country, the US demand decrease is large enough to affect worldwide demand, so imposing the tariff reduces worldwide demand for bananas. The world price of banana goes down (drops below \$10).

b. What happens to the domestic price of bananas in the US ? (Hint: up/down? Up by more/less than a dollar? Down by more/less than a dollar?)

Since world price is decreasing, US domestic price of banana increases by less than a dollar ($P_D = (P_W + \text{tariff}) < \11).

7. (10 pts) Welfare:

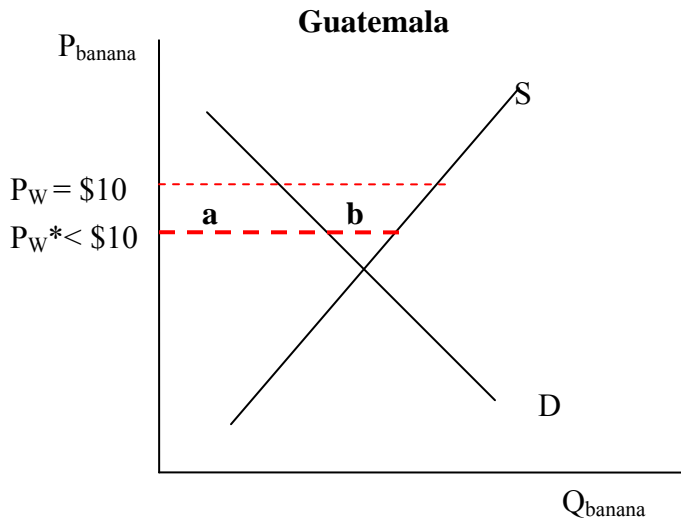
a. Is it possible for the banana tariff to make the US better off? How?

CS decreases by $(a+b+c+d)$, PS increases by a .

Tariff revenue gain = $c+e$, Deadweight loss = $b+d$.

If $e > b+d$, then the banana tariff will make the US better off.

b. What does the US banana tariff due to welfare in Guatemala? Why?



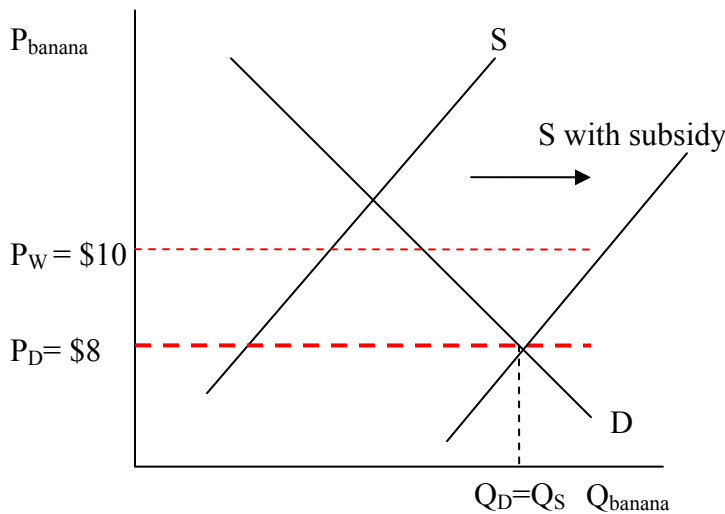
The US banana tariff lowers the world price of bananas, worsening Guatemala’s terms of trade. In the graph, Guatemala consumers gain a , while its producers lose $(a+b)$ as a consequence of the world banana price drop.

8. (10 pts) Can Guatemala effectively retaliate? Explain.

Since Guatemala is a “small” country it can not effectively retaliate a big country with counter tariff. If Guatemala impose a tariff on US computers, it directly hurts Guatemala’s aggregate welfare (see answers to 3) while the impacts on US is very small. Since US is a big country, the export price does not change and the decreases of export quantities to a small country are negligible.

9. (10 pts) The US decides to heavily subsidize the output of bananas so that the domestic price inclusive of the subsidy is \$8.

a. Draw a partial equilibrium supply-demand diagram showing the US banana market with the subsidy. Show the quantity supplied and demanded domestically, and imports if any. Be sure to include and label the original world price of bananas (\$10) on the graph.



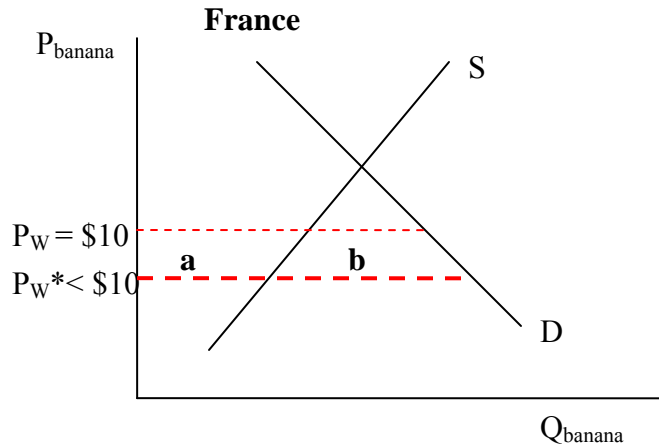
A very large subsidy would cause the supply curve to shift far to the right. (The supply curve is the marginal cost of production, so the subsidy from the government is substantially lowering costs for banana firms.) If the subsidy pushes costs below world prices (\$10) as the question suggests, the US stops importing bananas. All domestic demands are delivered by subsidized domestic producers ($Q_D=Q_S$).

b. What should happen to the world price of bananas?

The US subsidy is dramatically expanding its domestic supply; if the US is a large country, this expands world supplies and drives down world prices for bananas.

Note that the US, because of the subsidy, is now a banana exporter.

b. France is a banana importer. Should they be happy or unhappy about the US subsidy?



Since France is a banana importer, it's happy with the US subsidy. France's banana consumers gain (a+b), while its producers lose a.

c. Should Guatemala be happy or unhappy about the US subsidy?

Guatemala is an exporter of bananas, and it should be unhappy about the US subsidy (see the tariff example above.)