

## PC4 corrected

### Exercise #1: Impact of an import quota

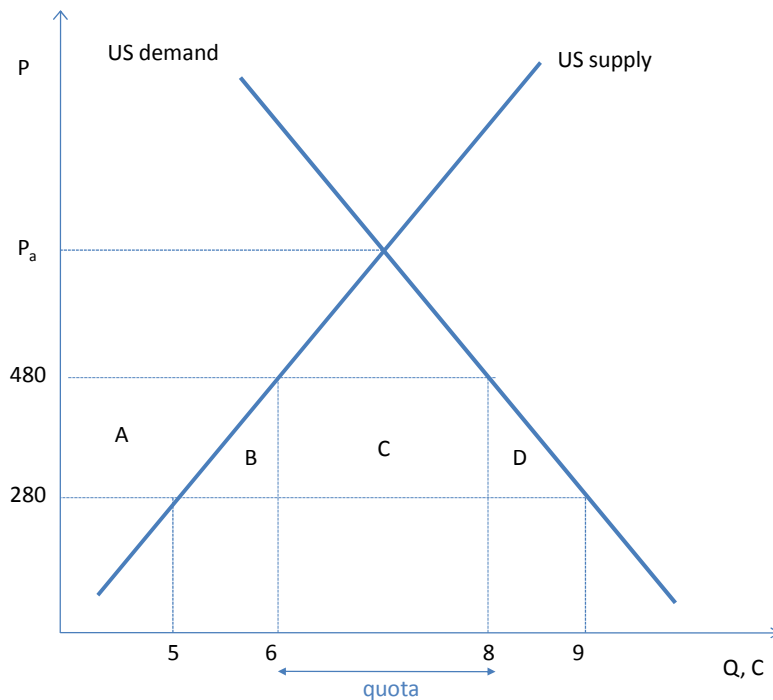
1. Denote by  $Y_f$ ,  $C_f$  and  $M_f$  US production, consumption and imports under free trade, and  $Y_q$ ,  $C_q$ ,  $M_q$  US production, consumption and imports with an import quota (if the quota is binding, then its volume is  $M_q$ ).

We have, in millions of tons per year:

$$\begin{array}{lll} Y_f = 5 & C_f = 9 & M_f = C_f - Y_f = 4 \\ Y_q = 6 & C_q = 8 & M_q = C_q - Y_q = 2 \end{array}$$

Since  $M_q < M_f$ , the quota is binding. **The quota is ton 2 million per year.**

**Graph** (where  $P_a$  is the price in autarky):



Due to the quota, the price rises from 280 to 480. This reduces the demand by ton 1 million/year and it allows US producers to sell an extra ton 1 million/year on the domestic market. Imports are reduced by ton 2 million/year.

2. **Surplus analysis:**

Compared to free trade, the quota makes the **US consumer** lose  $A+B+C+D$

$$A+B+C = 200 \times 8 = 1600$$

$$D = 0.5 \times 200 \times 1 = 100$$

Hence the consumer's loss is **1700**.

Compared to free trade, the quota makes the **US producer** gain A

$$A = 200 \times 5 + 0.5 \times 200 \times 1 = 1000 + 100 = 1100$$

Hence the producer's gain is **1100**. This is the price US producers would be prepared to pay for the quota to remain in place.

Except if the quota is sold to importers or to foreign suppliers, the **government** earns nothing.

Hence there is a **social loss** which is equal to  $B+C+D = 600$ .

3. **Quota rent** =  $(480-280) \times \text{quota} = 200 \times 2 = 400$

If quotas are allocated for free to importers, the rent is given to importers since they can import on the world market (at 280 dollars/ton) and sell on the domestic market (at 480 dollars/ton).

If quotas are allocated for free to foreign suppliers, then the rent is given to foreign suppliers since they can sell at 480 dollars/ton on the US market, instead of 280 dollars/ton with free trade.

Finally, if quotas are sold by the government at 200 dollars/ton, the rent is earned by the government, which can re-distributed to the consumers in order to (partially) compensate them for their loss.

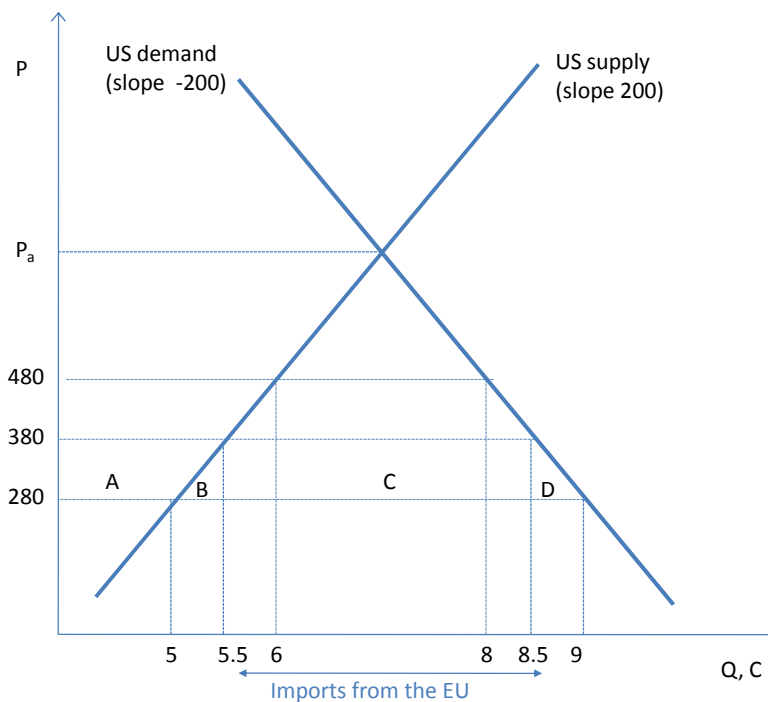
4. European tariff-quota rents represent 0.04% of world trade. Since the EU represents 37.7% of world imports, it means that European tariff-quota rents represent  $0.04/0.377 = 0.1\%$  of imports.

Tariff-quota rents are especially important for Japan, Korea, Mexico and Switzerland. For instance, Japan represented 4.4% of world imports in 2001 but around 20% of tariff-quota rents.

Conversely, tariff-quotas are not very important in the USA compared to their share in world imports (around 20%).

Note that the situation has changed since 2001 (decoupling of farm support in the EU).

5. Free-trade agreement with the EU: European sugar is now cheaper than sugar from other regions: 380 dollars/ton instead of  $280+200=480$  dollars/ton. Hence now the US consumes an additional  $\Delta C = 100/200 = 0.5$  million tons. The fall in US output is  $\Delta Y = 100/200 = -0.5$  million tons. Hence imports are now 3 million tons from the EU (instead of 2 with the quota). There is trade diversion since with multilateral free trade, imports would be of 4 million tons (and they would come from other regions of the world).



Compared with multilateral free trade, there is a social loss in the US:

- The consumer loses  $A+B+C+D = 100 \times 8 + 100 \times 0.5/2 = 800 + 25 = 825$
- The producer gains  $A = 100 \times 5 + 100 \times 0.5/2 = 500 + 25 = 525$
- The government gains nothing since there are no imports from the rest of the world.

Hence, the **social loss is 300**.

This loss is however lower than with the quota because the price on the US market is lower (380 instead of 480):

## **Exercise #2: NAFTA**

Graph 1 shows the substitution of China and of other Asian developing countries for NICs (Korea, etc), starting in the mid-1980s.

Graph 2 shows the fall in developing Asia in US imports of clothing, starting in the mid-1980s.

Graph 3 shows the rise in Latin America as a supplier of textile for the US market, starting in the early 1990s.

The combination of these three graphs shows that regional trade agreements have induced trade diversion, especially in the case of clothing.