

US is a small nation	US producers do not affect the world price The foreign supply of goods to US perfectly elastic (horizontal), e.g. rice
US is a large nation	US producers do affect the world price The foreign supply of good to US not perfectly elastic (slopes upward), e.g. computers

Consider a good, produced both domestically and abroad, but consumed only by US consumers. That is, the world supply to the US ( $S_{US}$ ) is the sum of both domestic production ( $S_D$ ) and foreign production ( $S_F$ ), but demand comes only from US consumers ( $D_{US}$ ). (We'll use this set up in all three cases we'll look at.)

US is a small nation, tariff on foreign producers

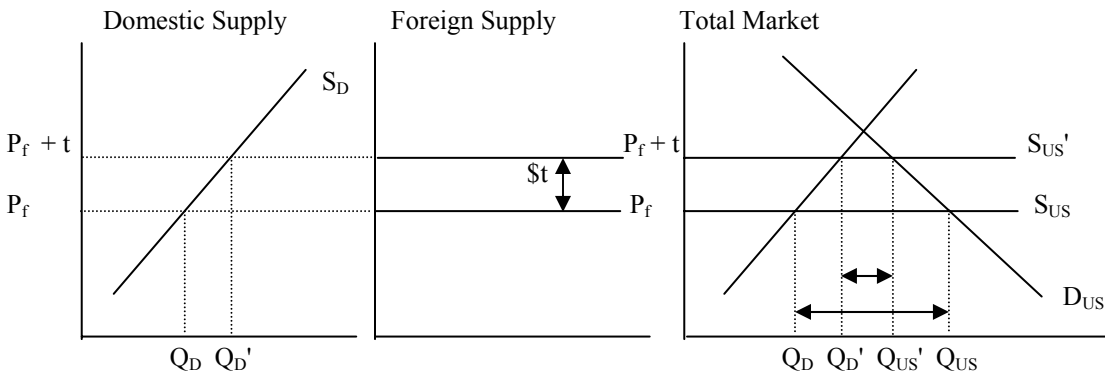
Since the US is a small nation on the supply side (no matter what the US produces, the foreign suppliers are willing to supply any quantity of the good at the price  $P_f$ ), the foreign supply curve is horizontal at  $P_f$ . Once the price rises as high as  $P_f$ , the foreign producers are willing to flood the market with the good.

The total supply to the US is the horizontal summation of the domestic supply and foreign supply. Look at each price, add up what the domestically suppliers would supply, and add the amount that the foreign suppliers would supply, and plot the point. This is how we get the total supply.

Before the tariff: At any price below  $P_f$ , the only firms willing to supply the good are domestic firms. The world supply curve is the same as the domestic supply. At any price greater than or equal to  $P_f$ , the foreign suppliers are willing to supply any quantity. They flood the market with the good. Thus, at a price of  $P_f$ , the world supply is horizontal at  $P_f$ . (The world supply is kinked: upward sloping until  $Q_D$ , then is horizontal.)

We put a tariff on foreign suppliers. This means that if they wish to sell the good in the US, they must pay a tariff (an import tax) of  $\$t$  per unit to the US government. Since the marginal cost of producing the unit is  $P_f$ , the foreign seller will now only sell the good in the US if the price they receive is  $P_f + t$ , since they must pay  $\$t$  to the US government. That is, the foreign supply curve shifts up by  $\$t$ .

After the tariff: At any price below  $P_f + t$ , the only firms willing to supply the good are the domestic firms. At a price of  $P_f + t$ , the foreign suppliers flood the market, and the world supply curve becomes horizontal. (The world supply is kinked: upward sloping until  $Q_{D'}$ , and then is horizontal.)



Results of imposing tariff

- (1) US consumption falls from  $Q_{US}$  to  $Q_{US'}$ .
- (2) because US price rises from  $P_f$  to  $P_f + t$ . (by the whole amount of the tariff)
- (3) Domestic production rises from  $Q_D$  to  $Q_{D'}$ .
- (4) Imports fall from  $(Q_{US} - Q_D)$  to  $(Q_{US'} - Q_{D'})$ . Notice the arrows above.

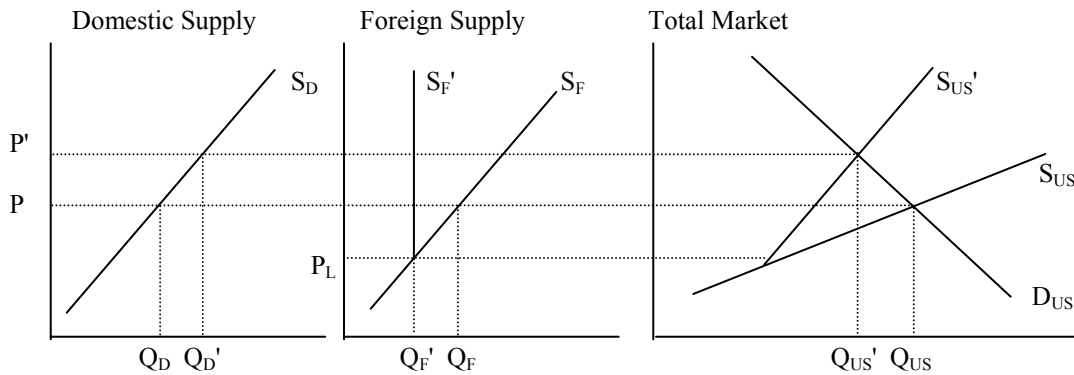
Winners - domestic producers. They get a higher price and produce more (higher producer surplus).  
 Losers - US consumers. They purchase fewer goods at a higher price (lower consumer surplus).  
 Indifferent (mostly) – Foreign producers. They received  $P_f$  before the tariff, they keep  $P_f$  after the tariff.

Quota - Large Nation

A quota is a legal limit on the amount of stuff foreigners are allowed to sell. Here, the foreign suppliers are prohibited from selling more than  $Q_F'$  units (the quota). Thus, if the price rises to a level such that the foreign suppliers would like to supply more than  $Q_F'$  (above  $P_L$ ), they are restricted to supply only  $Q_F'$ .

Before the quota: total supply to the US is the simple horizontal sum of  $S_D$  and  $S_F$ .

After the quota: below  $P_L$ , the supply curve is still the horizontal sum of  $S_D$  and  $S_F$ . At any price above  $P_L$ , the foreign suppliers will want to supply more than  $Q_F'$ , but will be legally prohibited from doing so. They will supply  $Q_F'$ . The total supply curve will be  $S_D + Q_F'$ , or looking at it a different way,  $S_D$  shifted over by  $Q_F'$  units. Just the domestic producers will be increasing production as the price increases above  $P_L$ .



Results of imposing the quota

- (1) US consumption falls from  $Q_{US}$  to  $Q_{US}'$ .
- (2) because US price rises from  $P$  to  $P'$ .
- (3) Domestic production rises from  $Q_D$  to  $Q_D'$ .
- (4) Imports fall from  $Q_F$  to  $Q_F'$ .

Winners - Domestic producers. They get a higher price and produce more (higher producer surplus)

Losers - US consumers. They purchase fewer goods at a higher price (lower consumer surplus).

Not sure - Foreign producers. They sell fewer units, but at a higher price. They lose a triangle of producer surplus (formed by  $P_L$ ,  $P$ ,  $Q_F$  and  $Q_F'$ ) on those units they no longer sell, but gain a square of consumer surplus (between  $P$  and  $P'$  out to  $Q_F$ ) as they get a higher price for the units they still sell. It depends on which is bigger.

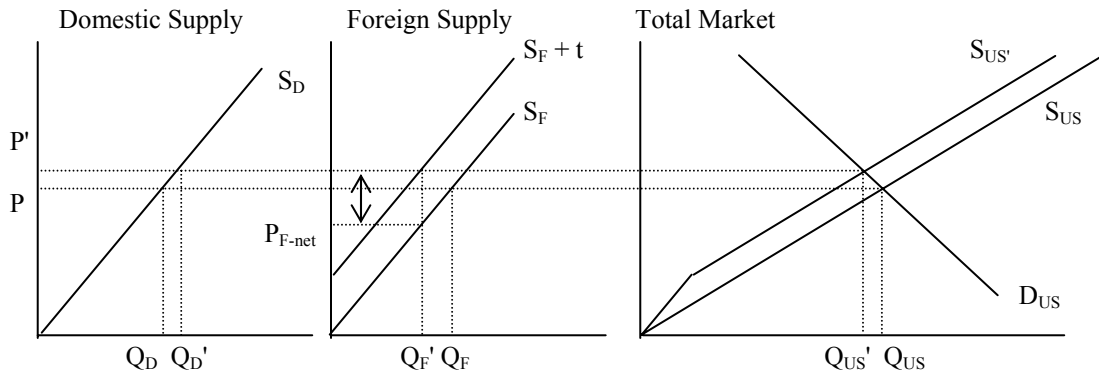
On that note, it's interesting that Japanese automakers voluntarily imposed upon themselves a quota (they agreed to limit their US sales to  $Q_F'$ ). Does that give you an idea which was bigger (the triangle or the box) for autos at the time?

Big picture so far

Producers of the good upon which a quota or tariff is imposed are enjoying higher profits at the expense of consumers of the good (who are paying higher prices). They are literally stealing your wealth. Producers who lobby politicians asking for quotas are trying to take money out of your pocket (and possibly foreign producer's pockets). Beware.

Note - You have learned about consumer and producers surplus, and you can shade in the areas and see how each group is affected for kicks (rather than saying consumers are worse off due to a higher price and fewer goods purchased, etc.). It's a little tricky to shade in the DWL in these pictures.

US is a large nation, Tariff



Results of imposing the quota

- (1) US consumption falls from  $Q_{US}$  to  $Q_{US}'$ .
- (2) Because US price rises from  $P$  to  $P'$ .
- (3) Domestic production rises from  $Q_D$  to  $Q_D'$ .
- (4) Imports fall from  $Q_F$  to  $Q_F'$ .

Winners - Domestic producers. They get a higher price and produce more (higher producer surplus).

Losers - US consumers. They purchase fewer goods at a higher price (lower consumer surplus).

Losers - Foreign producers. They receive  $P'$ , but must pay the government  $\$t$  per unit. Thus, the net price that they receive is  $P_{F-net}$ . They also sell fewer units (lower producer surplus).

Notice the following:

- (1) The price that consumers pay rises, but it does not rise by the full amount of the tariff (as it did in the small nation case)
- (2) The government collects tax (tariff) revenue. As a consequence of (1) above, and the fact that foreign suppliers receive only  $P_{F-net}$  (which is less than the original  $P$ ), we can say that foreigners bear a portion of the tax. In other words, foreigners are unambiguously worse off - they must pay the tariff to the US and hence receive a lower net price after the tariff.

Comparison of all three cases – some things you might not have noticed yet...

Notice in all three cases, price rises, consumption falls, domestic production of the good rises, and imports of the good falls. (Results 1-4 hold in all cases).

US is a small nation, tariff

- Price rises by full amount of tariff, thus
- US consumers bear the full burden of the tariff
- Tariff revenue is collected ( $\$t$  \* amount of imports)
- Foreign producers still receive the same net price.

US is a large nation, quota

- Price rises
- No tariff revenue is collected
- The effect on foreign producers is ambiguous. They may be worse or better off.

US is a large nation, tariff

- Price rises by less than full amount of the tariff, thus
- US consumers do not bear the full burden of the tariff
- Tariff revenue is collected, some of which comes at the expense of
- Foreign producers, who are unambiguously worse off.

Finer points on comparisons, with apologies for getting a little too detailed???

- If we know the right sized tariff and quota, an appropriate sized tariff and a quota could get the same effect on the quantities of foreign production and domestic production (Set the  $Q_F'$  of the quota = to the  $Q_F'$  from the tariff). However, in this case, we would prefer the tariff to the quota. In the tariff case, the government is collecting tax revenue. In the quota case there is no tax revenue. The amount that would have been collected as tariff revenue will end up instead as higher profits for those foreign producers that are still allowed to export their goods to the US.

There are more issues with actually administering these choices, i.e. demand shifts, changing technology, foreign producers lobbying for the right to be allowed to sell in the US, ...

- The large nation tariff was preferable to the small nation tariff because US consumers do not pay the full burden of the tariff. In the large nation tariff case, the price that consumers pay does not rise by the full amount of the tariff, while in the small nation case, it rises by the whole amount of the tariff. So, with the large nation case, it's possible to steal some wealth away from foreigners. It is at least possible (yet still not very likely), for the US as a whole (US producers, US consumers, and tariff revenue) to be made better off.

Some myths about international trade

1. International trade is different. No, international trade is just another economic activity - only difference is currencies and xenophobia. More international trade  $\Rightarrow$  more specialization and more gains from trade. No different than trading with interstate, intercity, interpersonal, etc. Do you get shook up that Pickens County is running a trade deficit with Oconee County? That all of the people from NY are buying up all the real estate in SC?
2. International trade is about competition. No, international trade is not about competition, it is about mutually beneficial exchange. Trade is done because it is mutually beneficial. Else it would not be done. When you walk into Tiger Town and trade money for beer, are you competing with Tiger Town? No. Trade restrictions reduce wealth. Just like exchange made both parties better off on Robinson Crusoe's island, so does international trade.
3. Exports are the goal of international trade. No, imports (not exports) are the goal of international trade. We want goods that other countries produce. You don't go to the pizza shop to export money; you go to import pizza. Unfortunately, other countries don't want our money. They want goods. Thus, we must export goods to pay for our imports. We pay for imports with exports. (Wouldn't it be great if we could print up money and trade it to other countries for TVs - money is pretty cheap to print). Any policy that we engage in that will end up limiting the amount of good we import from other countries will eventually lead to a reduction in the amount of goods that other countries import from us (US exports).
4. International trade destroys or creates jobs. No, international trade neither creates nor destroys jobs. There are an infinite number of jobs. International trade may reallocate jobs. There might be a steelworker who has a \$45,000 job with excellent work conditions. The steel industry will face more competition without trade restrictions. Tough cookies. He may have to take a job with a lower salary and less desirable working conditions. Tough cookies. When people say that a

trade restriction save 100 steelworkers jobs, what they fail to mention is that it may cost 100 jobs in an industry that was exporting goods to a foreign country (the computer industry).

Its possible our displaced steelworker will get a job in an industry producing a good that we now export. When he says that the government should impose trade restrictions to save his jobs, what he means to say is: I don't want a different job with less desirable working conditions where I can't make as much money. We all would like to reduce competition.

5. We need a new partnership between government and business. No. When the government gets involved, watch out. Invariably, producers of those goods (who have a large incentive to contribute to senator's campaigns) will benefit at the expense of consumers of the goods (who have little incentive to lobby against these measures). You, the consumer, will pay a higher price for sugar, and the sugar producers will earn more money. They are stealing your wealth. Watch your wallet....