So producers and the government gain from the tariff while consumers lose. However, the loss of consumers is spread over many consumers so that the loss per consumer is small while the benefits are spread over a limited of producers and the government so that the benefits per producer are large.

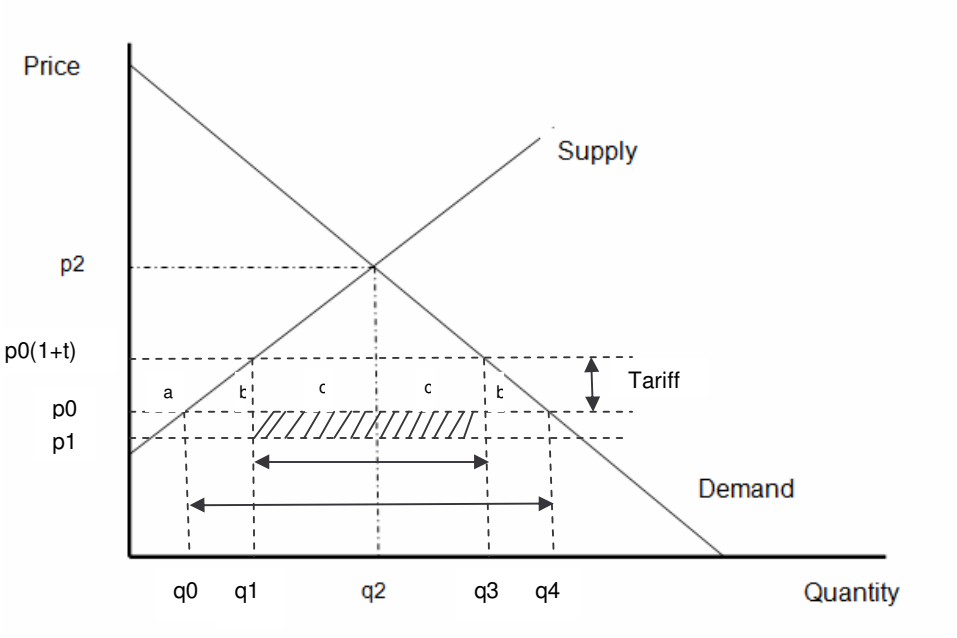


Figure: impact of a tariff

The conclusions above apply to a small home market. If we look at a large home market there are some changes. When there is a reduction of imports this results in a lower world price p1 instead of a higher world price. In this case the producer surplus, the consumer surplus and the government revenue will be the same as in a small market. However, the net welfare loss decreases. The shaded area is the government revenue paid by foreigners. The new net welfare loss will be the shaded area – the Harberger triangles. So the net welfare loss will only be positive if the government revenue paid by foreigners exceeds the Harberger triangles.

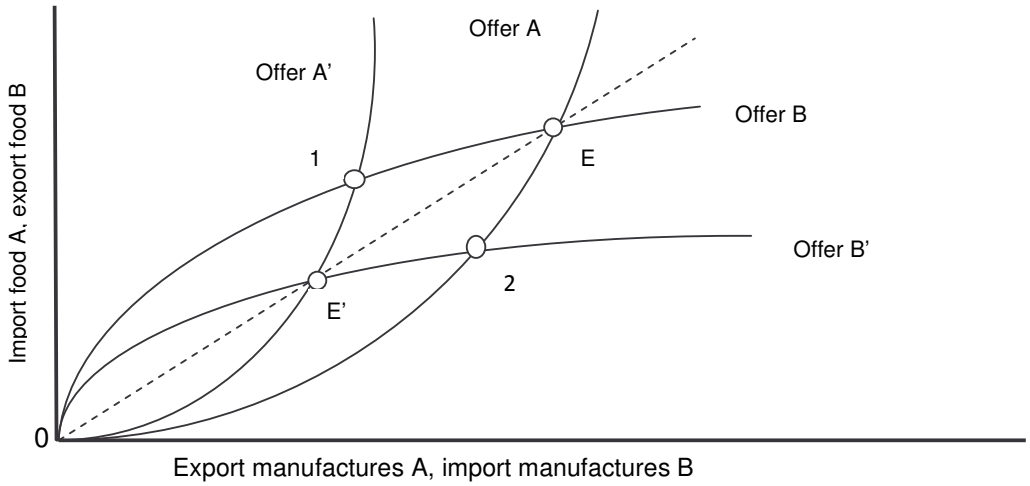
When a country imposes an ad valorem tariff t on the imports of manufactures, the domestic price will be higher than the world price of manufactures.

$$MRS_{tariff} = \frac{p_m(1+t)}{p_f} = MRT_{tariff} > \frac{p_m}{p_f}$$

The tariff imposes a double distortion on the economy:

1. Producers change the production. The domestic price differs from the world market price so the production is not at its optimal point. This results in an income loss and a lower welfare level. This is called the production effect.
2. Also consumption leads under the price differences. The utility will fall and therefore the consumption is not at its optimal point. This is called the consumption effect.

The offer curve: Connects export offers in exchange for imports for all prices. It summarizes all optimal production and consumption decisions in the economy.
It is possible to derive trade indifference curves from the offer curve. The trade indifference curve is tangent to trade balance lines at optimal points.



Combining the offer curve of two countries helps us to determine the trading equilibrium and the exports and imports. If we put both offer curves in one figure we can see where the trading equilibrium lies. Above we see the offer curves of two countries, A and B, combined in one figure. There is a trade equilibrium at the point where the two curves intersect, point E. The line through the origin and the equilibrium point is the trade balance line. The slope of this line gives us the free trade equilibrium price.

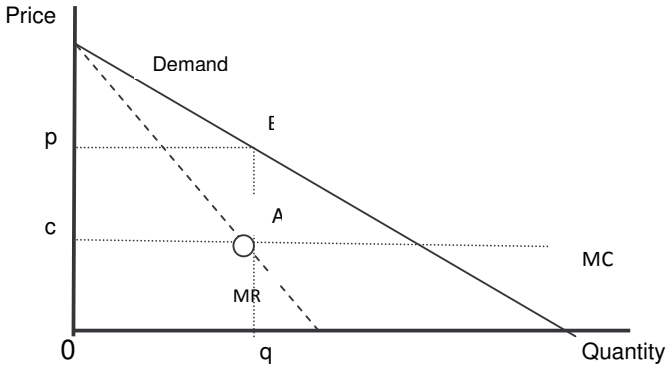
When imposing a tariff there will be a welfare loss and a reduction in the trade volume. A reduction of the trade volume means that the trade equilibrium is lower and so the offer curve will shift inwards. Given B's offer curve now has a restriction then the offer A curve will shift inward to offer A'. A imposes an optimal tariff to reach point 1. Same holds for a restriction on A's curve, then the offer curve of B will shift inwards to the curve offer B'. B imposes an optimal tariff to reach point 2. The intersect of the offer A' curve and the offer B' curve give us the new equilibrium point E'.
At this new equilibrium point the welfare for both country A and B has decreased. When imposing a tariff there is always a loss of welfare in a small country. A large country might benefit from an optimal tariff but these benefits disappear under a system of retaliation leading to tariff wars. Hence the need for international rules and policy coordination in the WTO.

For some countries that are very important for the economy, the average tariff rates have reached historical low levels in the last few years. An example of such a country is the USA.

Chapter C: Competitive Advantage

So far we have looked at perfectly competitive markets. In these markets firms do not have any market power. They take the market price as given and base their supply on this price. The total supply is determined by the actions of all firms together. Together with the demand of consumers this leads to a market price.
In some markets there are firms that are relatively large in their market. They realize that their production decisions will influence the market price. Firms will take this effect into consideration when maximizing profits. This is called imperfect competition. There are different types of imperfect competition, two types are:

1. *Monopoly*
   In a monopoly there is only one firm active in a specific market. This firm is called the monopolist. Because it is the only firm active, its actions have an enormous effect on the market. The demand curve of a monopolist is downward sloping. The MR curve has a slope twice as steep as the demand curve and has the same intercept.



Profit is maximized at point A where MR=MC
Operating profits equal area 0qBp – area 0qAc = area ABpc
A remarkable thing we see in the figure is that the price of the monopolist is higher than it MC. The monopolist charges a mark-up over the MC to determine its optimal price, resulting in positive operating profits.

$p\left(1 - \frac{1}{\varepsilon(q)}\right) = MC$

James Markusen's researched the impact of monopoly power in autarky. To explain his findings we use the following information:

- There is one manufacture producer, it is a monopoly market
- There are many producers of food, the market is perfectly competitive
- The market of production factors is perfectly competitive
- All firms maximize profits
- All consumers maximize utility

:We know that

- Domestic demand equals domestic supply in autarky equilibrium
- Utility is maximized when MRS = $\frac{p_m}{p_f}$
- Profit is maximized when $p_F = MC_F$ and $p_M \times (1-1/\varepsilon) = MC_M$

This all together brings us to the following equation:

$$\text{MRT} = \frac{MC_m}{MC_f} = \frac{p_m(1-\frac{1}{\varepsilon_m})}{p_f} < \frac{p_m}{p_f} = \text{MRS}$$

Where ε is the elasticity of demand for manufactures.

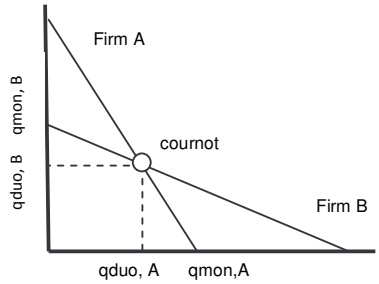
2. *Oligopoly*

It can also be that there are a few firms active in a specific market; this market is called an oligopoly. All firms realize that their actions have an influence on the market price. When there are only two firms the market is called a duopoly. First we are going to focus on a oligopoly/ The output of the two firms together forms the total output. The profits of firm A, with marginal costs c, are calculated as follows;

π_A = (p-c)q_A = [(a-c) – b(q_A+q_B)]q_A

Firm A and B produce homogeneous products. Each different output level of firm B gives a different optimal output level for firm A. So firm A chooses their optimal output level with the given output put level of firm B. This is firm behavior in a *Cournot-setting*.

The optimal profit points for A are the points where the isoprofit line of A intersects the output line of firm B. A line through all these profit maximizing points is called the firm A´s reaction curve. Of course the profits of firm A are maximized when firm B produces nothing. Below is a figure with both reaction curves.



There is a cournot dupoly equilibrium where the reaction curve of firm A intersects the reaction curve of firm B. In this equilibrium neither one of the firms has the incentive to change their output level. Thus this equilibrium results in higher output(summed over firms), lower prices and lower mark-up. The duopoly price is lower than the monopolistic price.

If the number of firms increases, the output increases and this implies that the market price will fall. The firm only takes into consideration the effect of the price decrease for its own output, but ignores the other firm. The profits for A are then maximized when MC=MR, this implies

$$p\left(1-\frac{q_A}{q}\frac{1}{\varepsilon(q)}\right) = MC$$

If there are more firms in a market, the market competition increases. There will be a lower market share per firm, and thus the mark-up is lower. This benefit is called the pro-competitive gain from trade. These gains of trade can be seen in the following figure.