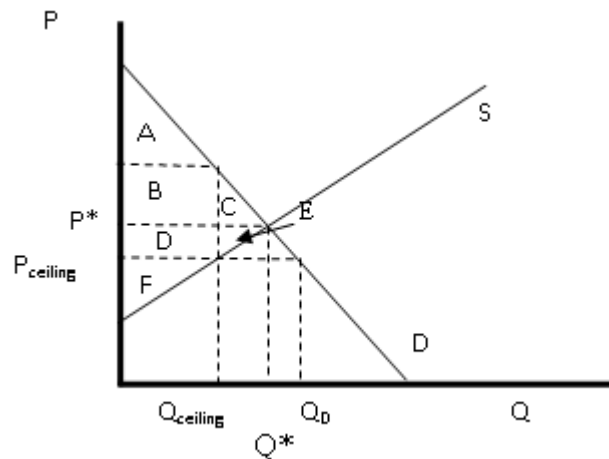


Lecture # 5 – Applications of Supply and Demand

I. Price Controls

- We began class discussing cases where the government sets a price ceiling – a maximum price for a good.
 - An example is rent control
 - The figure below shows the changes in welfare resulting from a price ceiling.

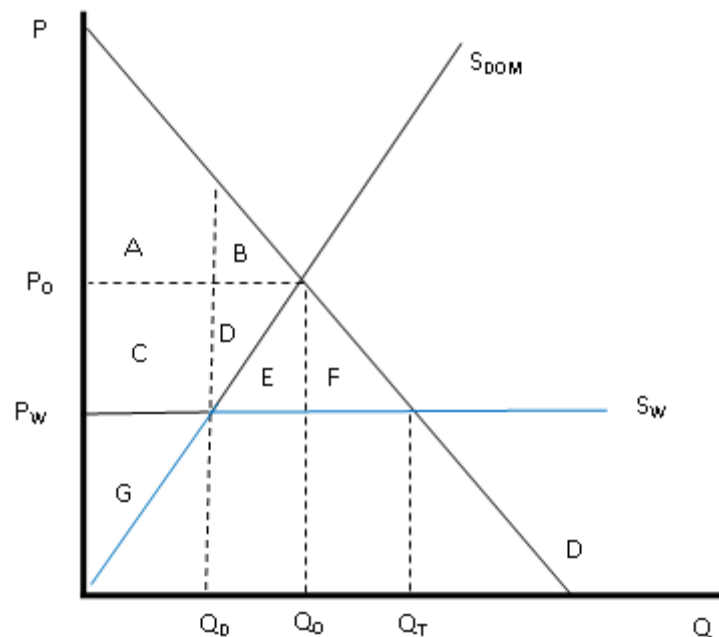


- Before the price ceiling:
 - Consumer surplus is areas A, B, & C
 - Producer surplus is areas D, E, & F
- After the price ceiling:
 - Consumer surplus is areas A, B, & D
 - Producer surplus is area F
 - Deadweight loss is areas C & E
- Because the government sets the price below the market equilibrium, there is excess demand for the good.
 - Not everyone who would like to purchase the good is able to do so.
 - This may result in other secondary effects, such as:
 - people may have to wait in long lines to get the goods,
 - a black market may develop,
 - demand for other goods may increase (e.g. people move to suburbs if they can't get an apartment in the city).
 - This is an example of a *general equilibrium* effect.

- While total consumer surplus may go up, not everyone benefits, since some people who purchased the good before could not get it now.
 - Even though they can afford it, suppliers are not making the good available.
- Producer surplus will be lower.
- Some of the surplus that went to either consumers or producers before simply disappears. This is the deadweight loss.

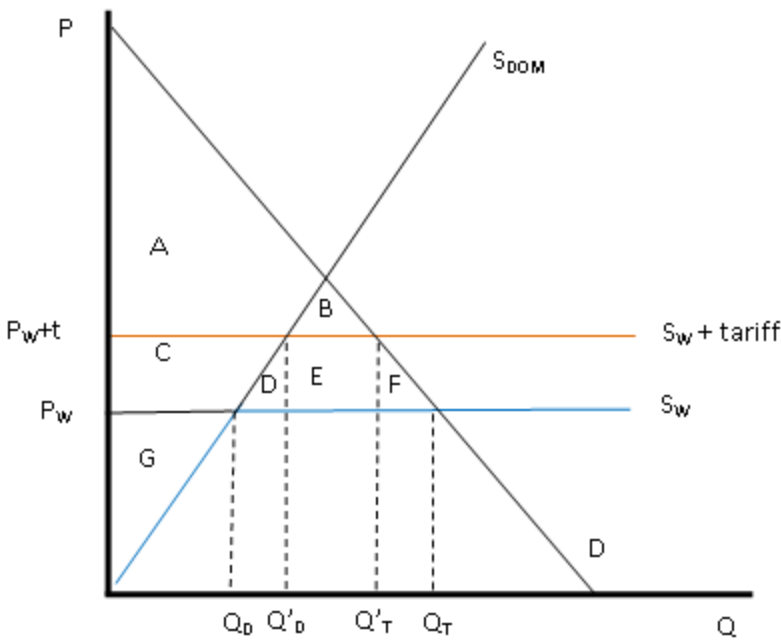
II. Trade Policy

- Next, we considered how trade policy affects welfare.
 - Our example applies to a small country. Because it is small, the country is a *price taker*. That is, its actions do not influence the world price of the product being considered.
 - Thus, we can apply our competitive model.
 - If the country were large enough to affect prices throughout the world, the perfectly competitive model would not apply.
 - There are two supply curves to consider.
 - S_{DOM} is domestic supply. This is what can be produced within the country.
 - S_W is the world supply. Because the country is small, it can purchase as much as it wants at the price prevailing in world markets.
 - Thus, this supply curve is horizontal.



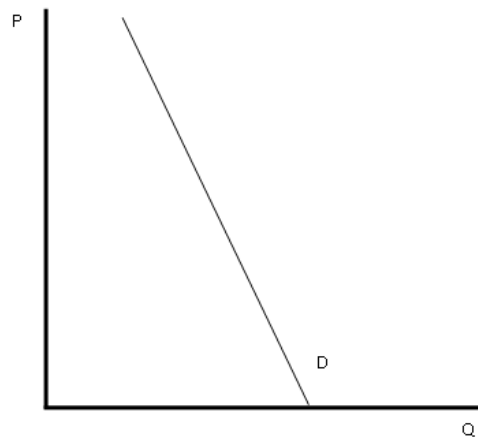
- Without trade, only the domestic supply matters. The equilibrium is at P_0 and Q_0 .
- With trade, the blue lines represent supply.
 - The price that prevails in the market is the world price, P_W .
 - Total quantity demanded at this price is Q_T .
 - Domestic producers make as much as they can for that price. This is the blue portion of S_{DOM} .
 - Q_D is the quantity produced at home.
 - Foreign producers then provide the remaining goods.
 - Thus, imports = $Q_T - Q_D$.
- Finally, consider the change in welfare:
 - No trade:
 - Consumer surplus is areas A & B.
 - Producer surplus is areas C, D, & G.
 - With trade:
 - Consumer surplus is areas A, B, C, D, E, & F.
 - Consumers are better off. They buy more, and at a lower price.
 - Producer surplus is area G.
 - This is for domestic producers only.
 - They are worse off because they face more competition, and thus sell fewer goods at a lower price.
 - The gains from trade are areas E & F. These areas are only captured with free trade.
- Next, we considered the effect of a tariff.
 - A per unit tariff raises the world price in the country imposing the tariff.
 - The new supply is $S_W + \text{tariff}$.
 - The new price with trade is thus $P_W + t$.
 - The total quantity demanded at this higher price is Q'_T .
 - Local producers can supply more at the higher price.
 - Thus, Q'_D is now produced locally.
 - Imports fall to $Q'_T - Q'_D$.
 - Finally, consider the change in welfare.
 - With free trade:
 - Consumer surplus is areas A, B, C, D, E, & F.
 - Producer surplus is area G.
 - With the tariff:
 - Consumer surplus is areas A & B.
 - Producer surplus is areas C & G.
 - Revenue is area E.
 - For each unit imported, the government collects the tariff. The tariff times the number of imports is revenue to the government.
 - The rectangle E represents this area.

- Areas D and F disappear. These are the deadweight loss.
 - F represents lost opportunities because fewer units are purchased.
 - D is lost because some goods are produced at a higher cost by local producers, rather than by foreign producers.
 - Consider, for example, the part time farmers in the *Economist* article on rice tariffs in Japan who would be forced out of the market if Japan removed tariffs on rice.
- Consumers must now pay the higher cost of local production.

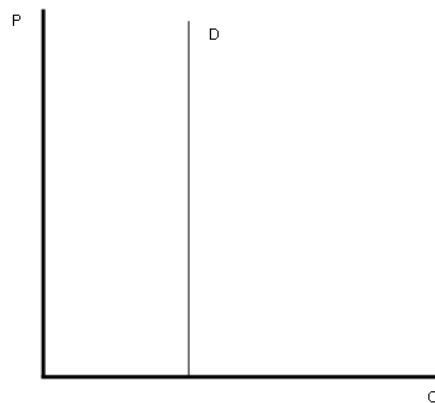


III. Elasticity

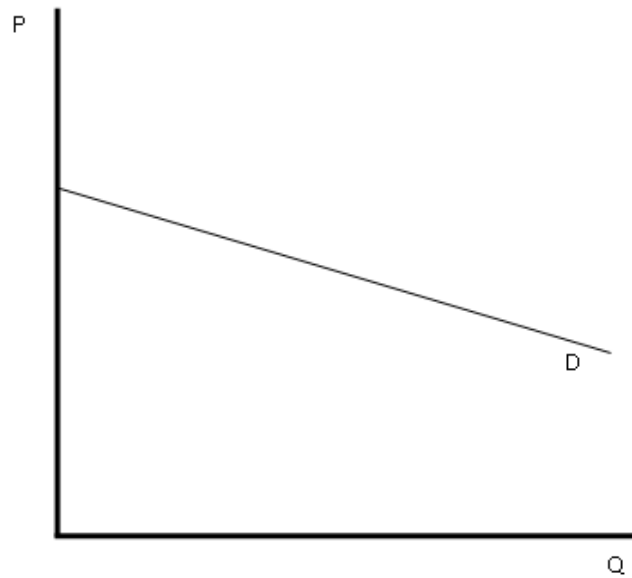
- Elasticity tells us the percentage change that will occur in one variable due to a one percent change in another variable.
 - It is a unit-free measure of comparison.
- Price elasticity of demand measures the sensitivity of quantity demanded to price changes. It tells us the percentage change in quantity demanded for a 1% change in price.
 - $\epsilon_p = \% \text{ change quantity demanded} / \% \text{ change price}$
 - Elastic vs. inelastic
 - absolute value $> 1 = \textit{elastic}$
 - absolute value $< 1 = \textit{inelastic}$
 - Demand curves are steeper when demand is inelastic
 - Inelastic demand is a steep demand curve
 - Quantity demanded does not change much, even for large changes in price.



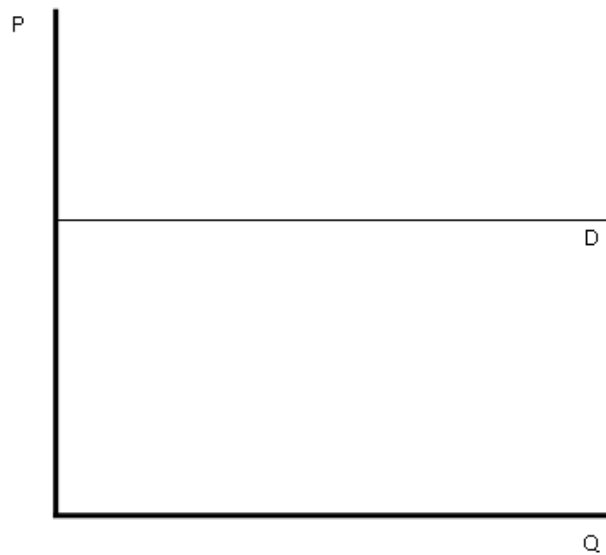
- An extreme case is perfectly inelastic demand: quantity demanded is the same at any price:



- Elastic demand is a flat demand curve.
 - Even small changes in price result in large changes in quantity demanded.



- An extreme case is perfectly elastic demand: the price is the same for any quantity demanded.



- Elastic vs. inelastic
 - absolute value > 1 = *elastic*
 - absolute value < 1 = *inelastic*
 - Elasticity and revenue:
 - When price is inelastic, price and revenue move together. An increase in price raises revenue.
 - *Intuition:* if demand is inelastic, consumers will not respond much to a change in price. Most people still purchase the good, and they pay more to do so.
 - When price is elastic, price and revenue move in the opposite direction. Revenues fall when the price is raised.
 - *Intuition:* if demand is elastic, consumers respond strongly to a change in price. The drop in quantity dominates the increased price.