Market Equilibrium

Market is the place the buyers and sellers make the transacttions.

- The place is not necessarily a physical place

Market in this chapter is assumed to be in perfect competition.

Assumptions:
1. Many buyers
2. Many sellers
3. Every seller sells essentially the same product (homogeneous product) that can perfectly substitute each other's.
4. Every seller has the same technology and access to the same quality and prices of economic resources.
5. At a given market price P_0, the market demand and market supply will respond with quantity demanded Q_D and quantity supplied Q_S.

If $Q_D > Q_S$, then market price increases.

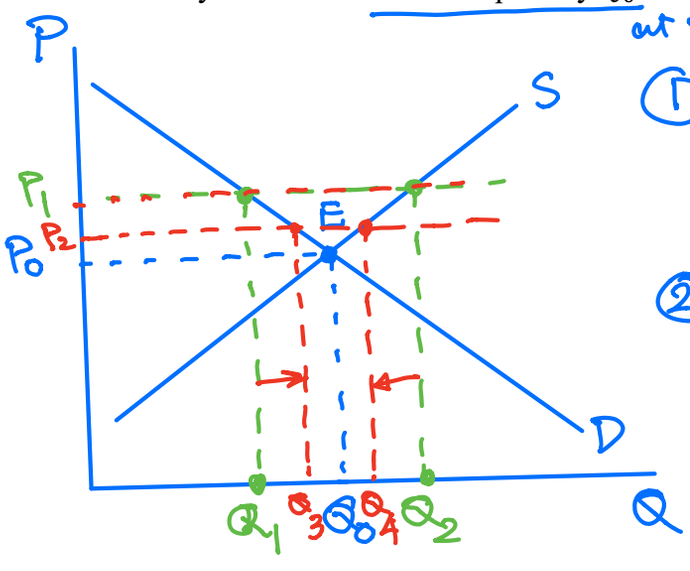
If $Q_D < Q_S$, then market price decreases.

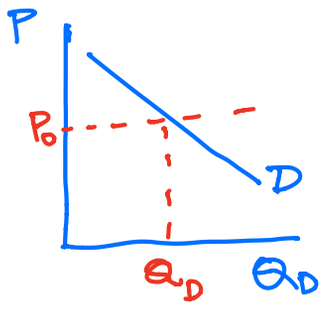
$$Excess\ Demand = Q_D - Q_S$$
$$Excess\ Supply = Q_S - Q_D$$

Note: $Excess\ Demand = -Excess\ Supply$

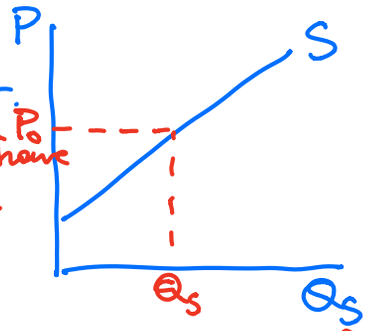
When $Excess\ Demand = Excess\ Supply = 0$, there is no pressure on the price to change. That is, we have a market equilibrium.

Market Equilibrium is the point $E = (Q_0, P_0)$ where at equilibrium price P_0 the buyers and sellers are willing and able to buy and sell at the same quantity $Q_0 = Q_D = Q_S$ at P_0.





relationship between P+Q_D willingness ability.



buyers and sellers are price takers.

of perfect competition market such that one individual cannot have any influence on mkt price.

1000 10 million.

$P_0 \rightarrow Q_D = 1000$ ✓✓✓
$P_0 \rightarrow Q_S = 800$

Excess S > 0

$Excess\ Demand = Q_D - Q_S = 1000 - 800 = 200 = E_D$
$Excess\ Supply = Q_S - Q_D = E_S$

$Q_D = Q_S$.

Mkt Equilibrium Condition

$E_D = 0$
or $Q_D = Q_S$ at the eq price

① Eq is at $E = (Q_0, P_0)$
at P_0, $Q_D = Q_0$, $Q_S = Q_0$ } $Q_D = Q_S$, $E_D = Q_D - Q_S = 0$

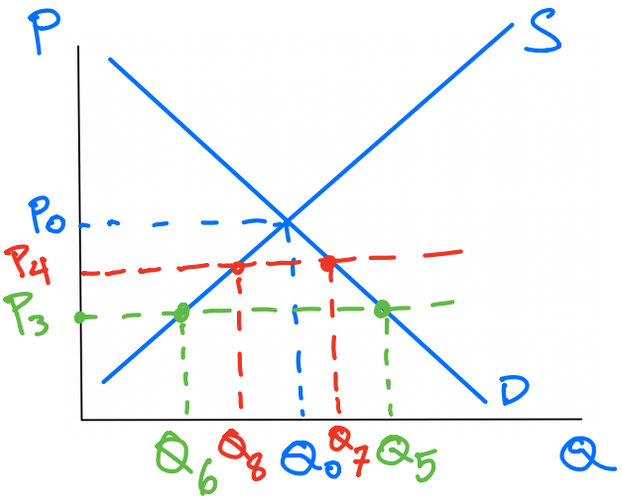
② Eq is at $E = (Q_0, P_0) = E_S$.
because if the market price $\neq P_0$
a) Price $= P_1 > P_0$
at P_1, $Q_D = Q_1$, $Q_S = Q_2$ } $Q_2 > Q_1$
Excess $S = Q_2 - Q_1 > 0$

according to assumption #5.

Price mechanism of the market:

- market price P_1 will decrease to P_2.
- at P_2, $Q_D = Q_3 < Q_4 = Q_S$.
- so we have Excess $S > 0$ (smaller)
- so the price will keep getting lower until market price $= P_0$ where $Q_D = Q_S = Q_0$
- There is no pressure to lower the price any further.

- Why is the market equilibrium is at $E = (Q_0, P_0)$?



b) $P_3 < P_0$ market price

$Q_D = Q_5 > Q_6 = Q_S$

Excess $D = Q_5 - Q_6 > 0$

∴ price will get higher.

. to P_4 where

$Q_D = Q_7 > Q_8 = Q_S$

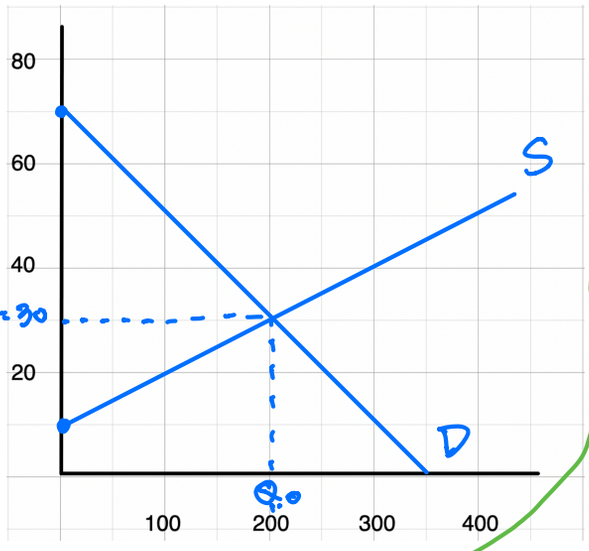
still have Excess $D = Q_7 - Q_8 > 0$

So price will keep getting higher until it reaches P_0 where there is no Excess D.

Example:

$Q_D = 350 - 5P$ ⇐ *Demand*: $P = 70 - \frac{1}{5}Q_D$

$Q_S = -100 + 10P$ ⇐ *Supply*: $P = 10 + \frac{1}{10}Q_S$



$70 - \frac{1}{5}Q_D = 10 + \frac{1}{10}Q_S$ (Q_0 / Q_0)

$60 = \left(\frac{1}{5} + \frac{1}{10}\right)Q_0$

$= \left(\frac{2+1}{10}\right)Q_0$

$Q_0 = 200$.

Find P_0 by using D or S.

(Demand) $P_0 = 70 - \frac{1}{5}Q_0 \overset{Q_0=200}{=} 30$

(Supply) $P_0 = 10 + \frac{1}{10}Q_0 \overset{Q_0=200}{=} 30$

$Q_D = Q_S$.

$350 - 5P_0 = -100 + 10P_0$

$15P_0 = 450$

$P_0 = 30$

similarly using D + S functions

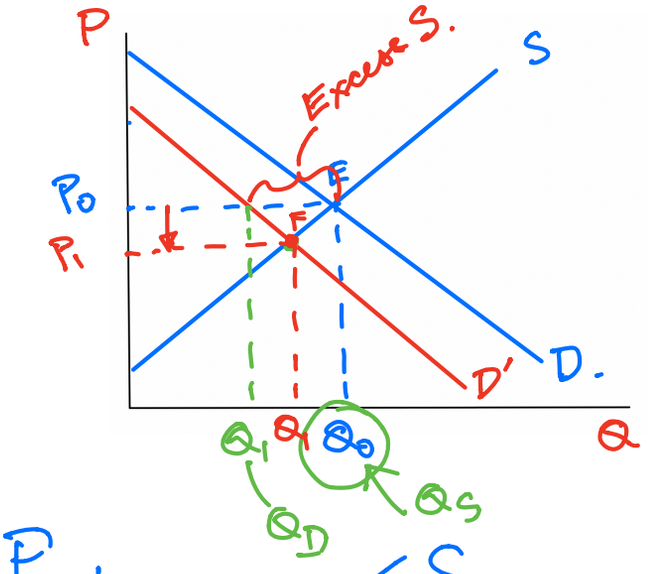
$Q_D = Q_0 = 350 - 5(30)$

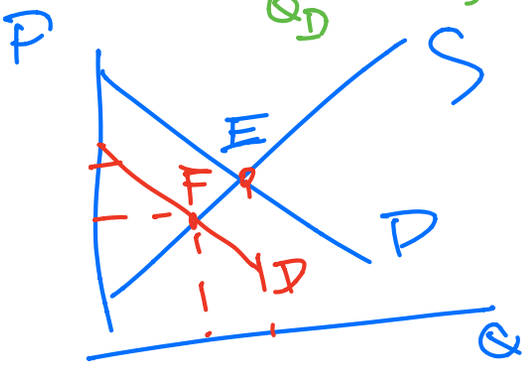
$=$

Change in Market Equilibrium 4 possible cases.

- How does COVID-19 impact the market demand of a product? lower income ⇒ lower Demand.

Case 1: Demand decreases from D to D'





Before mkt D decreases, initially the Eq is at $E=(Q_0, P_0)$

at the instant that D decreases to D', at the market price P_0 with the new lower D,

at P_0, $Q_S = Q_0$ – (same)

Q_D is lower to Q_1

→ we have Excess $S = Q_0 - Q_1 > 0$

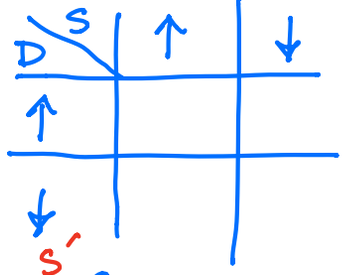
So by assumption #5, the market price will decrease.

And will keep decreasing until it reaches P_1 because F is our new eq. where $Q_D = Q_S$.

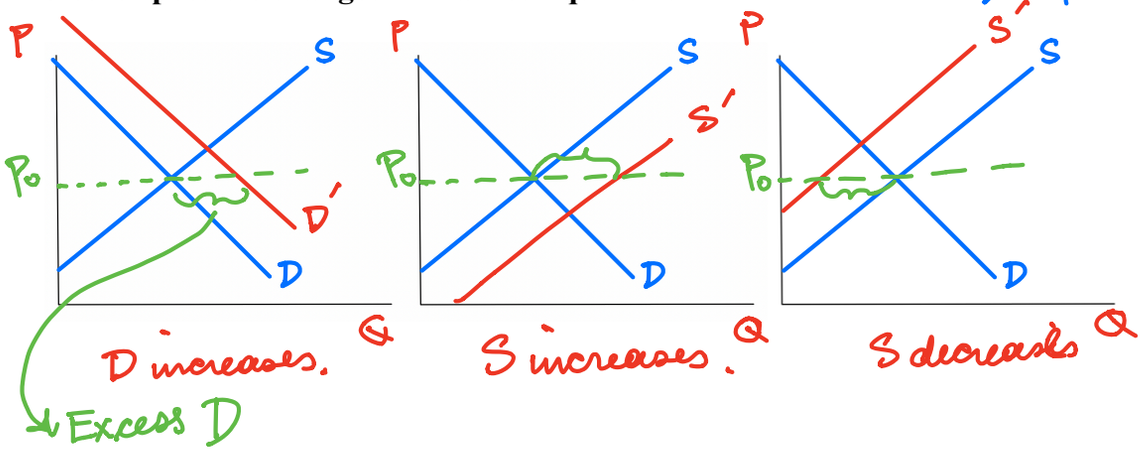
or Excess $S = 0$.

i.e. we have the eq. condition.

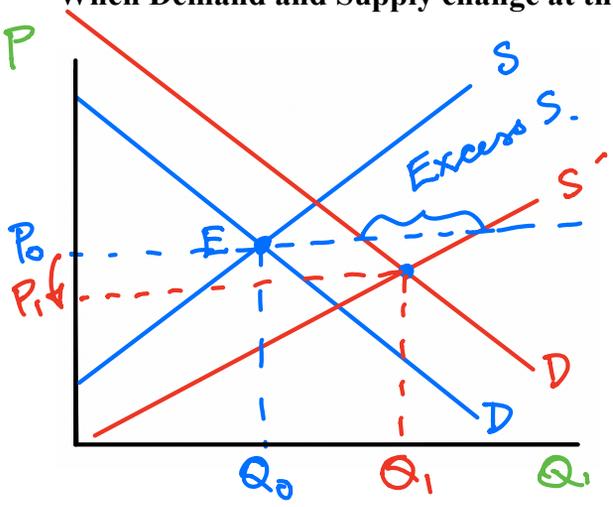
when D decreases, mkt price decreases
mkt Q decreases.



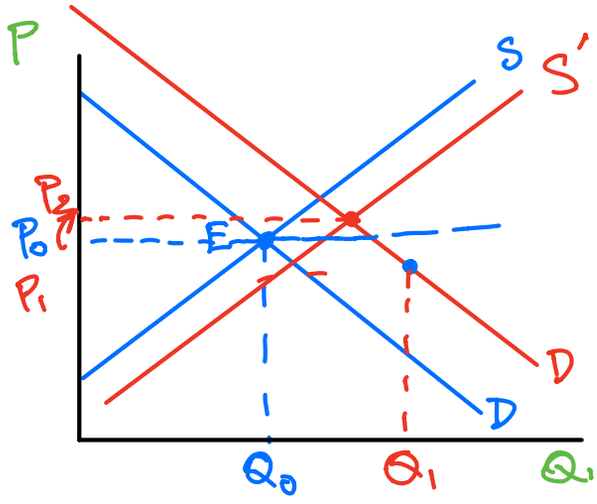
3 other possible changes in Market Equilibrium



When Demand and Supply change at the same time



D + S increase.
- market quantity always higher
- but market price can be higher or lower.



D \ S	↑	↓
↑	P ?	
	Q ↑	
↓		P ?
		Q ↓

check.