

PRINCIPLES OF MICROECONOMICS, SEMESTER 1, 2016

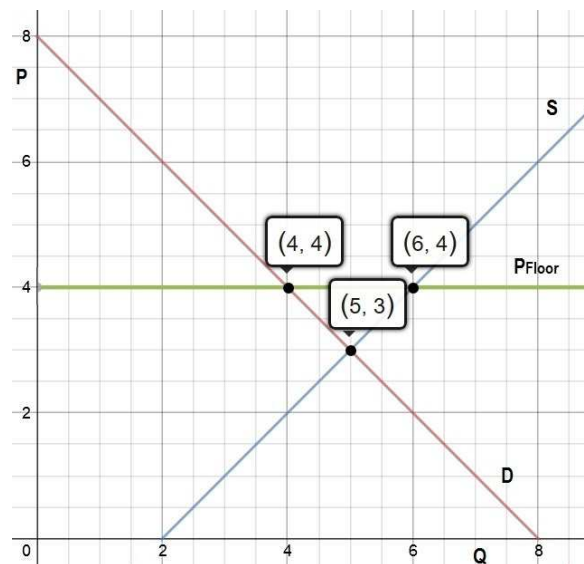
Tutorial 4 (Week 5)

Q1. The government is worried about the effect of climate change on sheep farmers, and decides to set a price floor of \$4.00 per bale of wool. The following functions are for the Australian domestic wool market:

$$Q_D = 8 - P \quad \text{and} \quad Q_S = P + 2$$

[Quantities are in millions of tonnes, prices in \$ per bale of wool]

a. Graph the market. What is the equilibrium price and quantity in this market?



Notice that the market is **NOT** in equilibrium, it is in disequilibrium!

The equilibrium without the price floor would have been: $P = 3$, $Q = 5$, but with the price floor, the price is fixed at \$4; $Q_D = 4$, and $Q_S = 6$, so we have a surplus ($Q_S > Q_D$) of 2.

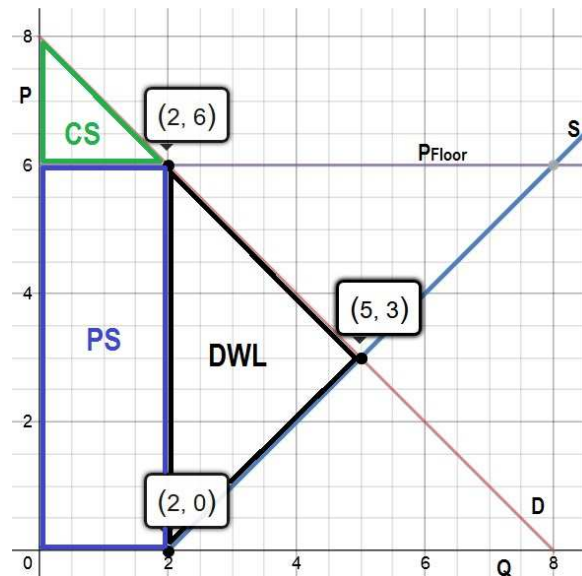
b. Comment on the government's current policy.

It has created a **surplus** in the market.

It is meant to protect producers, but it is not clear how the unsold surplus is distributed amongst these producers - however, **as a group**, they are better off.

Consumers are worse off, and there is now DWL in the market.

- c. The government is considering changing their price floor to \$6.00 a bale. Calculate the consumer surplus, producer surplus, and dead weight loss.



$$CS = \{(8 - 6) \cdot 2\} / 2 = 4/2 = 2$$

$$PS = 6 \cdot 2 = 12$$

$$DWL = \{6 \cdot (5 - 2)\} / 2 = 18/2 = 9$$

- d. What other policies might the government reasonably consider?

Subsidies (but this also leads to DWL, and costs the government money), OR they could just leave the market alone (this is my preferred option)!!

- e. If the government ends up choosing to implement the \$6.00 a bale price floor, as in (c), what can we expect would happen over time to the surplus facing the market, and why?

The surplus will get worse over time, because over time, both the supply curve and the demand curve will become more elastic (i.e. flatter!), as both producers and consumers respond to price signals more perfectly the longer you give them to respond... (for an example of how this works with the supply curve, look at: *Lecture 4 => Price elasticity of supply (slides 20 to 24)*).

Q2. As the owner of a business, would it ever be possible that you would choose to hire an additional worker where their marginal product of labour (MP_L) was less than the *previous* worker you hired? Why / why not?

YES, it is possible!! MP_L is different to $MRPL$ => MRL measures how much **product** or **output** that an additional unit of labour produces... We need to compare the **VALUE** of this product (the $MRPL$) with the cost (the wage) to see whether we are making profit from hiring an additional unit of labour.

See over the page for a made-up example:

A coke factory sells coke cans for K2 each. They hire people at a wage of K5 an hour.

The factory hires one additional worker for one additional hour (remember that all workers are assumed to be identical!)

- This worker produces 10 cans of coke in that hour (MPL = 10 cans). Their marginal revenue is thus: 10 cans * K2 = K20.
- The worker costs K5 per hour, so the profit for hiring that worker is: $\pi = TR - TC = 20 - 5 = \underline{\text{K15}}$.

The factory now hires *another* additional worker for *another* additional hour.

- This worker produces only 5 cans of coke in that hour (MPL = 5 cans). Their marginal revenue is thus: 5 cans * K2 = K10.
- The worker costs K5 per hour, so the profit for hiring that worker is: $\pi = TR - TC = 10 - 5 = \underline{\text{K5}}$.

Even though the MPL of the second additional worker is LESS than that of the first additional worker, it is still **possible** for them to produce a profit for the firm - it will just be *less* profit than the first additional worker. It is also possible that you would not hire the second worker if their MPL was low enough (i.e., imagine that the second additional worker actually produced only 2 cans in their additional hour!).

Q3. Governments often levy high taxes on cigarettes, arguing that they want to improve health outcomes for their citizens.

- a. Whilst governments usually *do* have a keen interest in the health of their citizens, what other reason might there be for governments to choose to raise revenue from cigarette taxes in particular?

Cigarettes are inelastic products, and inelastic products are much better at raising tax revenue than elastic products, because even as the price goes up (due to the tax), people reduce their consumption by proportionally less than the increase in price. So another reason for the government to tax cigarettes might be to raise a lot of revenue!

- b. Assuming that cigarettes remain legal, what would be a more effective policy for the government to adopt if it wanted to reduce cigarette consumption? Illustrate your answer using a supply and demand model.

There are lots of reasonable answers - price floors, price ceilings, HIGHER taxes, import tariffs (assuming cigarettes were imported)... But I think the best answer that helps to resolve the underlying problem is to change people's *desire* to consume cigarettes by raising awareness of how bad they are for your health. On a demand and supply diagram, this would simply be a contraction in supply. If we don't address the desire to consume, other approaches may just cause a sizeable and unregulated black market... (For example, think about the betelnut ban - it is not changing the underlying desire to consume betelnut, and black markets are flourishing!).

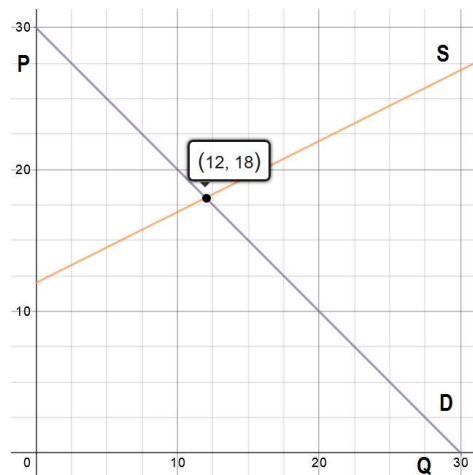
Q4. The demand and supply functions in the Papua New Guinean market for cars are as follows:

$$P = 30 - Q_D$$

$$P = 12 + 0.5Q_S$$

[Quantities are in hundreds of thousands of units per year, prices are in thousands of kina.]

a. Graph the market. What is the equilibrium price and quantity in this market?



$$30 - Q = 12 + 0.5Q \Rightarrow 18 = 1.5Q \Rightarrow 18 / 1.5 = Q \Rightarrow Q = 12$$

Substitute $Q = 12$ into either of the original equations to solve for P ; $P = 30 - Q = 18$.

b. Assume that the current price of a car is K24,000. What is the quantity demanded and quantity supplied? What is this situation in the market called? What would you expect would happen to this price?

With $P = 24$:

$$Q_D: 24 = 30 - Q_D \Rightarrow Q_D = 6;$$

$$Q_S: 24 = 12 + 0.5Q_S \Rightarrow 0.5Q_S = 12 \Rightarrow Q_S = 24$$

$Q_S > Q_D$, so there is a surplus (of 18 hundred thousand). We would expect the price to drop back to the equilibrium price (note that there is no price control to stop this from happening!).

c. There is suddenly a new function for the supply curve in the market: $P = 2 + 0.5Q_S$

What is the new equilibrium price and quantity? Give two examples of what could have caused this change in the market.

$$30 - Q = 2 + 0.5Q \Rightarrow 28 = 1.5Q \Rightarrow 28 / 1.5 = Q \Rightarrow Q = 18.666$$

Substitute $Q = 18.666$ into either of the original equations to solve for P ; $P = 30 - Q = 11.333$.

It is an expansion in supply \Rightarrow there are LOTS of possible examples of what could cause this.

If you can't think of any, just look at Lecture 3: Slide 26 for inspiration!