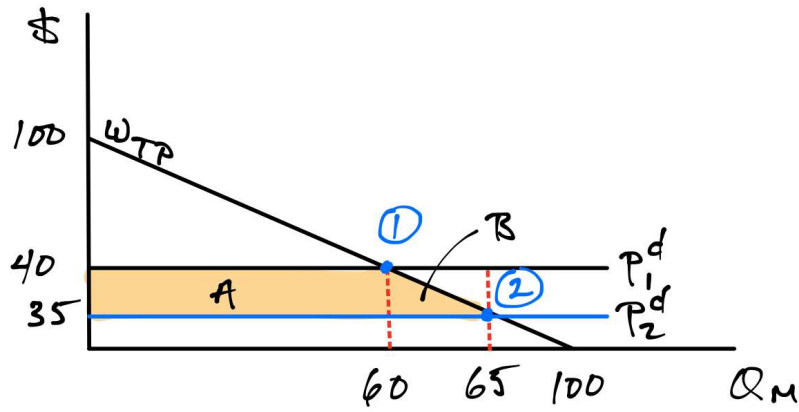


Impacts on Welfare

Impact on buyers:



$$A = 5 \times 60 = 300$$

$$B = 0.5 \times 5 \times 5 = 12.5$$

$$\Delta CS = A + B$$

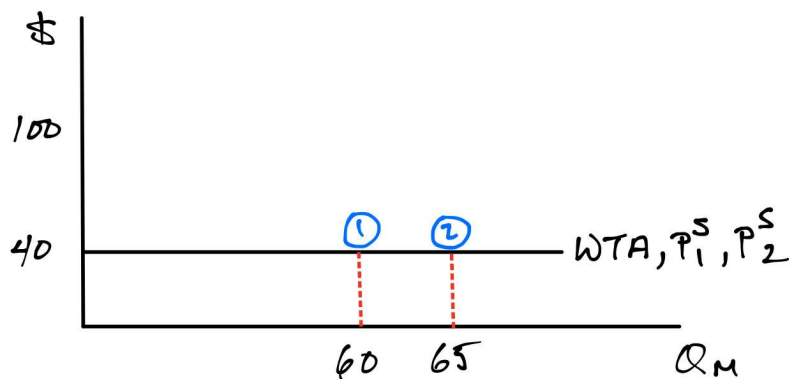
$$\Delta CS = 300 + 12.5 = +312.5$$

Note: two groups of buyers:

| Group | Q | ΔCS |
|-----------------|----|-------------|
| Existing buyers | 60 | A = 300 |
| New buyers | 5 | B = 12.5 |

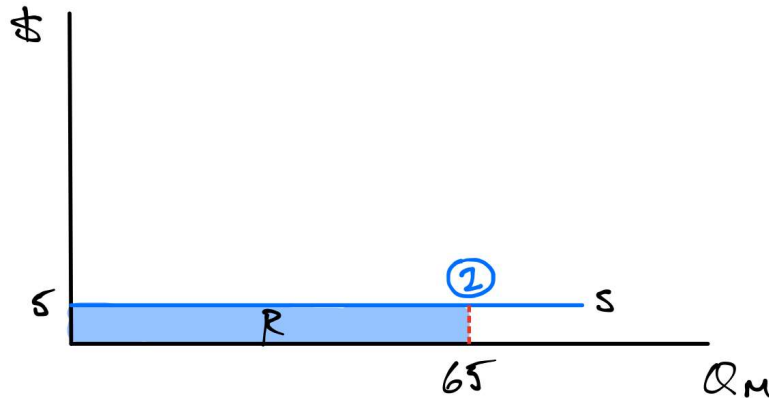
Most of gains go to existing "inframarginal" buyers

Impact on sellers:



$$\Delta PS = 0$$

Impact on the government:

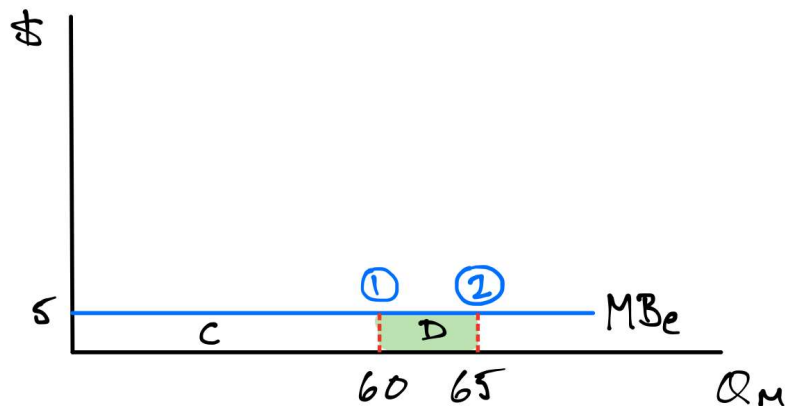


$$R = 5 \cdot 65 = 325$$

$$\Delta Rev = -R$$

$$\Delta Rev = -325$$

Impact on outsiders via the externality:



Old benefits: C

New benefits: C+D

Gain: +D

$$D = 5 \cdot (65 - 60) = 25$$

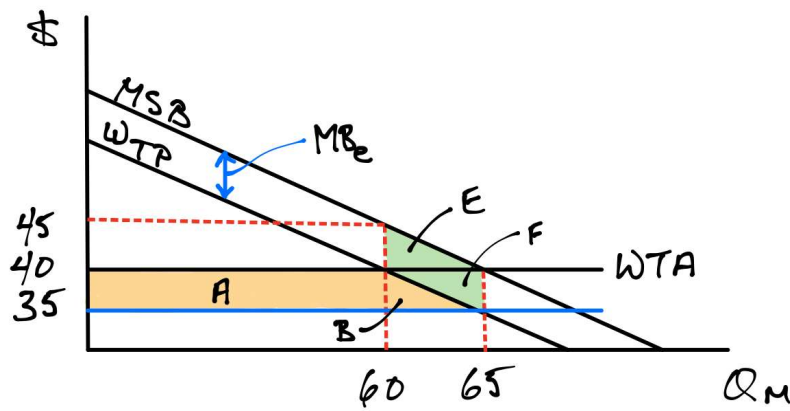
$$\Delta Ext = +25$$

Overall impact on SS:

| | |
|--------------|--------|
| Buyers: | +312.5 |
| Sellers: | 0 |
| Government: | -325 |
| Externality: | +25 |

$$\Delta SS = +12.5$$

Putting everything in a single diagram:



$$\Delta CS = A + B$$

$$\Delta PS = 0$$

$$\Delta Rev = -(A + B + F)$$

$$\Delta Ext = E + F$$

$$\Delta SS = +E$$

Check:

$$E = 0.5 * 5 * 5 = 12.5 \quad \checkmark$$