Daily Exercise Solution

Given information:

$$P_1^d = \$200$$
$$Q_1^d = 1{,}000$$
$$\eta = -4$$

$$P_2^d = \$210$$

Solving for Q_2^d:

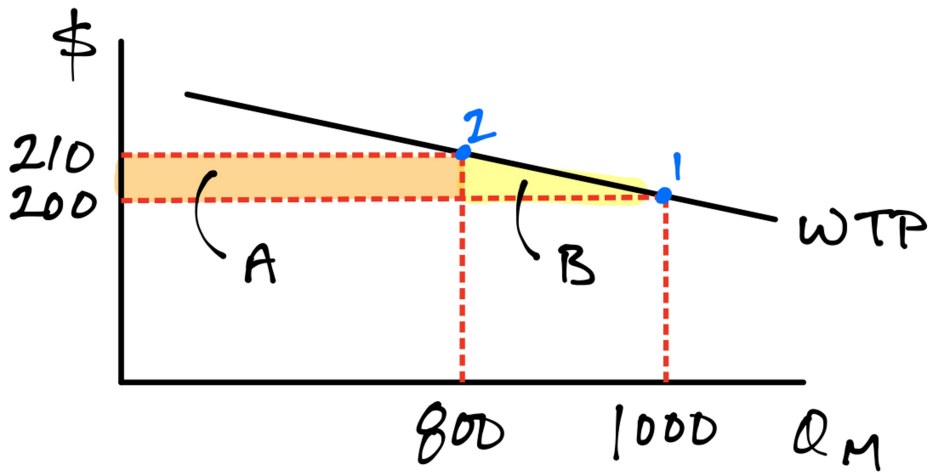
$$\%\Delta P^d = \frac{210 - 200}{200} = \frac{10}{200} = 0.05 = 5\%$$

$$\eta = \frac{\%\Delta Q^d}{\%\Delta P^d}$$

$$\%\Delta Q^d = (\eta) * (\%\Delta P^d)$$
$$\%\Delta Q^d = (-4) * (5\%)$$
$$\%\Delta Q^d = -20\%$$

$$Q_2^d = 1000 - 0.2 * 1000 = 800$$

Graphing:



Calculating the areas:

A = 10*800 = 8,000

B = 0.5*10*200 = 1,000

ΔCS = -(8,000 + 1,000) = -9,000

Calculating the DWL ratio:

$$\frac{DWL}{Revenue} = \frac{B}{A} = \frac{1{,}000}{8{,}000} = 0.125 = 12.5\%$$

Going beyond the exercise:

Ratio is better for less elastic demands.

Example:

Same initial price and quantity

$\eta = -1$

Q drops much less:

$\%\Delta Q^d = \eta(\Delta P^d)$

$\%\Delta Q^d = (-1)(5\%)$

$\%\Delta Q^d = -5\%$

$Q_2^d = 0.95 * 1{,}000 = 950$

Revenue larger and DWL smaller:

A = 10*950 = 9,500

B = 0.5*10*50 = 250

Ratio far smaller:

$$\frac{DWL}{Revenue} = \frac{250}{9{,}500} = 0.026 = 2.6\%$$

General principle:

Tax least elastic goods to minimize DWL