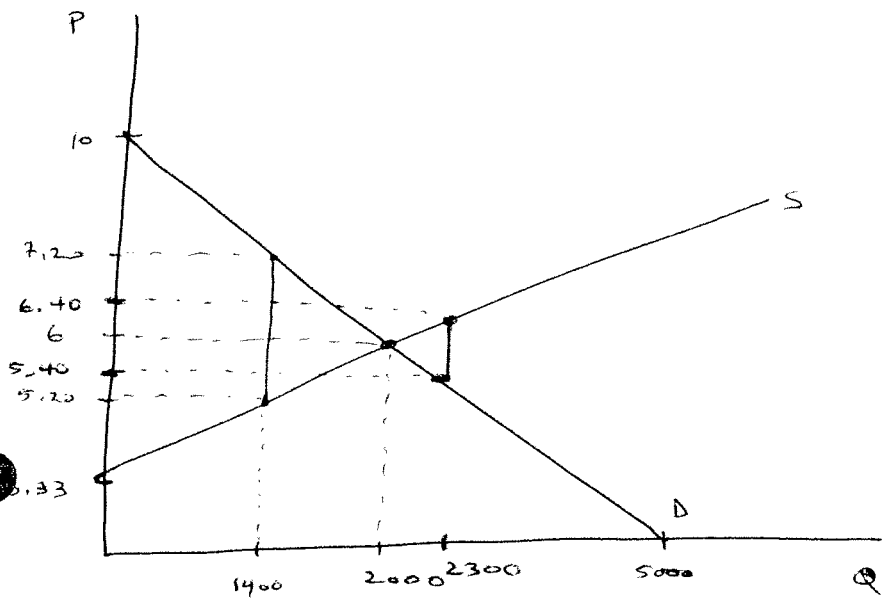


Supply and Demand Applications

The Market for Corn

$$Q = 5000 - 500P \quad \Rightarrow \quad P = 10 - \frac{1}{500}Q$$

$$Q = -2500 + 750P \quad \Rightarrow \quad P = 3.33 + \frac{1}{750}Q$$



$$5000 - 500P = -2500 + 750P$$

$$7500 = 1250P$$

$$P^* = 6$$

$$Q^* = 2000$$

$$CS = \frac{1}{2} \cdot 4 \cdot 2000 = 4000$$

$$PS = \frac{1}{2} \cdot 2.67 \cdot 2000 = 2670$$

Per Unit Tax

$$t = \frac{4}{2} \quad P_c = P_p + t \quad \rightarrow \quad \text{Tax Wedge}$$

$$P_c = P_p + \frac{4}{2}$$

$$Q = 5000 - 500P_c$$

$$Q = -2500 + 750P_p$$

$$5000 - 500(P_p + 2) = -2500 + 750 P_p$$

$$4000 - 500 P_p = -2500 + 750 P_p$$

$$6500 = 1250 P_p$$

$$P_p = 5.20 \quad P_c = 7.20$$

$$Q = 1400$$

Q/ who pays the tax?

$$P_c - P^* = 7.20 - 6 = 1.20$$

$$P^* - P_p = 6 - 5.20 = 0.80$$

↳ why does the consumer pay more?

$$E_d = \frac{dQ}{dP} \cdot \frac{P}{Q} = \left| -500 \cdot \frac{6}{2000} \right| = \frac{3}{2} = 1.50$$

$$E_s = \frac{dQ}{dP} \cdot \frac{P}{Q} = 750 \cdot \frac{6}{2000} = 2.25$$

Supply curve is relatively more elastic at the equilibrium!

Q/ How does the tax affect welfare?

$$\text{New CS} = \frac{1}{2} \cdot 2.80 \cdot 1400 = 1960 \quad \Delta \text{CS} = 2040$$

$$\text{New PS} = \frac{1}{2} \cdot 1.87 \cdot 1400 = 1309 \quad \Delta \text{PS} = 1361$$

$$\text{Tax Revenue} = 2 \times 1400 = 2800 \quad \approx 3400$$

$$\text{DWL} = 600 = \left(\frac{1}{2} \cdot 2 \cdot 600 \right) = 3400$$

Q/ Can you repeat the analysis with a 20% tax?

Ad Valorem tax? $(P_c = P_p (1 + T))$

$$(P_c = P_p (1 + .20))$$

Per Unit Subsidy

$$P_c = P_p - S$$

Suppose $S = \$1$

$$5000 - 500 (P_p - 1) = -2500 + 750 P_p$$

$$5500 = -2500 + 1250 P_p$$

$$8000 = 1250 P_p$$

$$P_p = 6.40$$

$$Q = 2300$$

$$P_c = 5.40$$

How does the subsidy affect welfare?

$$\text{New CS} = \frac{1}{2} \cdot (4.60) \cdot 2300 = 5290$$

$$\text{New PS} = \frac{1}{2} \cdot (3.04) \cdot 2300 = 3530.50$$

$$\text{Subsidy Cost} = 1 \cdot 2300 = 2300$$

$$\text{DWL} = \frac{1}{2} \cdot 1 \cdot 300 = 150$$

$$\text{ACS} = 1290$$

$$\Delta \text{PS} = 860.50$$

$$= 2150.50$$



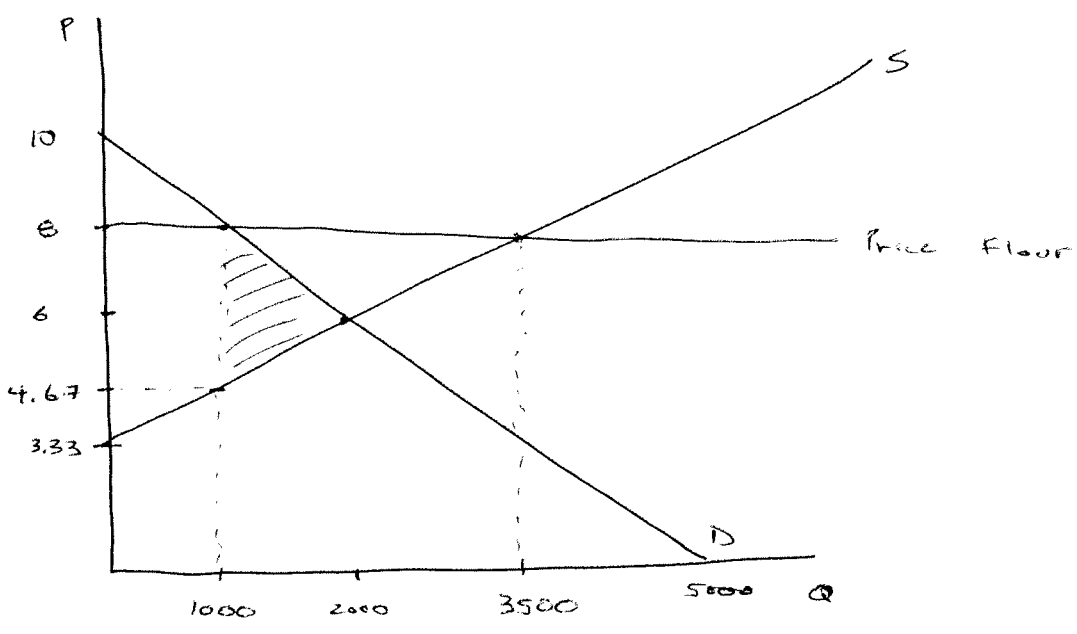
Price Controls

Price Floor

Suppose $\bar{P} = 8$

$$Q_d = 1000$$

$$Q_s = 3500$$



Welfare Effects?

$$\text{New CS} = \frac{1}{2} \cdot 2 \cdot 1000 = 1000$$

$$\Delta \text{CS} = -3000$$

$$\begin{aligned} \text{New PS} &= \left[\frac{1}{2} \cdot 1.33 \cdot 1000 \right] + \left[3.33 \cdot 1000 \right] \\ &= 3995 \end{aligned}$$

$$\Delta \text{PS} = +1325$$

$$\text{DWL} = 1665 = (.5 \cdot (3.33) \cdot 1000)$$

