Opt. condition for multimkt monopolist: $MR_1 = MR_2 = MC$.

Now, $MR_1 = P_1\left(1 - \frac{1}{\epsilon_1}\right)$, ϵ_1 = abs price elasticity of dd for Mkt 1

$MR_2 = P_2\left(1 - \frac{1}{\epsilon_2}\right)$

$\therefore \; MR_1 = MR_2 \Rightarrow P_1\left(1 - \frac{1}{\epsilon_1}\right) = P_2\left(1 - \frac{1}{\epsilon_2}\right)$.

$$\Rightarrow \frac{P_1}{P_2} = \frac{\left(1 - \frac{1}{\epsilon_2}\right)}{\left(1 - \frac{1}{\epsilon_1}\right)} \rightarrow \begin{array}{l} > 1 \Rightarrow P_1 > P_2 \\ < 1 \Rightarrow P_1 < P_2 . \end{array}$$

Suppose: $\epsilon_2 > \epsilon_1 \Rightarrow \epsilon_1 < \epsilon_2$

$$\frac{1}{\epsilon_2} < \frac{1}{\epsilon_1}$$

$$-\frac{1}{\epsilon_2} > -\frac{1}{\epsilon_1}$$

$$\left(1 - \frac{1}{\epsilon_2}\right) > \left(1 - \frac{1}{\epsilon_1}\right)$$

$$\Rightarrow \frac{\left(1 - \frac{1}{\epsilon_2}\right)}{\left(1 - \frac{1}{\epsilon_1}\right)} > 1 \quad \text{or} \quad \frac{P_1}{P_2} > 1 \Rightarrow \boxed{P_1 > P_2}.$$

The monopolist will charge higher price in the mkt in which demand is relatively inelastic.

Q. Consider a monopolist operating in 2 mkts having 10 customers each. A representative customer from mkt 1 has demand curve: $q_1 = 10 - P_1$ and for mkt 2 it is $q_2 = 8 - P_2$. $MC = 2$.

(a) If the monopolist can price discriminate, what prices would he charge? Find π.

Demand in mkt 1 $\Rightarrow$ $Q_1 = 10(10 - P_1)$

Demand in mkt 2 $\Rightarrow$ $Q_2 = 10(8 - P_2)$

Mkt 1 : $\frac{Q_1}{10} = 10 - P_1 \Rightarrow P_1 = 10 - \frac{Q_1}{10}$.

Mkt 2 : $\frac{Q_2}{10} = 8 - P_2 \Rightarrow P_2 = 8 - \frac{Q_2}{10}$

Inverse demand curves.

$$\pi = R_1 + R_2 - C = \left(10 - \frac{Q_1}{10}\right)\cdot Q_1 + \left(8 - \frac{Q_2}{10}\right)\cdot Q_2 - 2(Q_1 + Q_2)$$

$$\frac{\partial \pi}{\partial Q_1} = 0 \Rightarrow 10 - \frac{Q_1}{5} - 2 = 0 \Rightarrow 8 - \frac{Q_1}{5} = 0 \Rightarrow Q_1^* = 40.$$

$$\frac{\partial \pi}{\partial Q_2} = 0 \Rightarrow 8 - \frac{Q_2}{5} - 2 = 0 \Rightarrow 6 - \frac{Q_2}{5} = 0 \Rightarrow Q_2^* = 30.$$

$$P_1^* = 10 - \frac{40}{10} = 10 - 4 = 6, \quad P_2^* = 8 - \frac{30}{10} = 8 - 3 = 5.$$

$$\pi^* = 40 \times 6 + 30 \times 5 - 2(40 + 30)$$
$$= 240 + 150 - 140 = 250.$$

(b) If the monopolist cannot price discriminate, find π.

Monopolist will charge the same price in both mkts.

$P_1 = P_2 = P$.

Mkt 1 demand $\Rightarrow Q_1 = 10(10 - P)$.

Mkt 2 demand $\Rightarrow Q_2 = 10(8 - P)$

Total dd $\Rightarrow Q = Q_1 + Q_2 = 10(10 - P + 8 - P) = 10(18 - 2P)$.

$$Q = 180 - 20P \Rightarrow 20P = 180 - Q$$
$$P = 9 - \frac{Q}{20}.$$

$$\pi = \left(9 - \frac{Q}{20}\right)\cdot Q - 2\cdot Q.$$

$$\frac{\partial \pi}{\partial Q} = 0 \Rightarrow 9 - \frac{Q}{10} - 2 = 0 \Rightarrow 7 = \frac{Q}{10} \Rightarrow Q^* = 70.$$

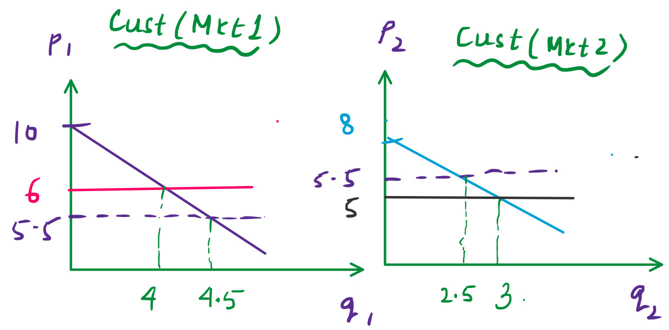
$$P^* = 9 - \frac{Q}{20} = 9 - \frac{70}{20} = 9 - 3.5 = 5.5$$

$$\pi^* = 5.5 \times 70 - 2 \times 70$$
$$= \frac{11}{2} \times 70 - 2 \times 70 = 70\left(\frac{11}{2} - 2\right) = 70\,(7 \ldots$$

$$= \frac{11}{2} \times 70 - 2 \times 70 = 70\left(\frac{11}{2} - 2\right) = 70\left(\frac{7}{2}\right) = 245$$

HW

(c) In which situation are the customers of both the mkts better off ?



Case I: With price discrimation

$$P_1^* = 6, \quad P_2^* = 5$$

$$\text{Welfare} = CS_1 + CS_2 =$$

Case II: without price discrimination

$$P_1^* = P_2^* = P^* = 5.5$$

$$\text{Welfare} = CS_1 + CS_2 =$$

Q. Consider a multimarket monopolist selling his product in the domestic/home mkt & the international mkt. The domestic demand curve is: $P_h = 5 - \frac{3}{2} q_h$ and in the international mkt $P_f = 3$. The cost fn for the monopolist is $C(q) = q^2$, $q = q_h + q_f$. [monopolist is a price-taker in the international mkt]

(a) Find opt q_h^*, q_f^*.

$$P_h = 5 - \frac{3}{2} q_h \Rightarrow R_h = \left(5 - \frac{3}{2} q_h\right) q_h$$

$$P_f = 3 \Rightarrow R_f = 3 \cdot q_f .$$

$$\pi = R_h + R_f - C = \left(5 - \frac{3}{2} q_h\right) q_h + 3 q_f - (q_h + q_f)^2$$

$$\frac{\partial \pi}{\partial q_h} = 0 \Rightarrow 5 - 3q_h - 2(q_h + q_f) = 0 \Rightarrow 5 - 3q_h = 2(q_h + q_f)$$

$$\frac{\partial \pi}{\partial q_f} = 0 \Rightarrow 3 - 2(q_h + q_f) = 0 \Rightarrow 3 = 2(q_h + q_f)$$

Compare: $5 - 3q_h = 3 \Rightarrow 2 = 3q_h \Rightarrow q_h^* = \frac{2}{3}$

$$P_h^* = 5 - \frac{3}{2} \times \frac{2}{3} = 5 - 1 = 4$$

(ii) $3 = 2(q_h + q_f)$

(ii) $3 = 2(q_h + q_f)$

$p_h^* = 5 - \frac{3}{2} \times \frac{2}{3} = 5 - 1 = 4$

$\frac{3}{2} = q_h + q_f \Rightarrow q_f^* = \frac{3}{2} - \frac{2}{3} = \frac{9-4}{6} = \frac{5}{6}$.

(b) Suppose the home govt restrick the sale in the int mkt to a max of $1/6$ units. Determine q_h^*, q_f^*.

Without restriction: $q_f^* = 5/6$.

$R_f = 3 \cdot q_f \Rightarrow q_f \uparrow \Rightarrow R_f \uparrow$.

Restriction: $q_f = \frac{1}{6}$. $\Rightarrow q_f^* = \frac{1}{6}$.

$$\pi = \left(5 - \frac{3}{2} q_h\right) q_h + 3 \cdot q_f^* - (q_h + q_f^*)^2$$

$$\pi = \left(5 - \frac{3}{2} q_h\right) q_h + 3\left(\frac{1}{6}\right) - \left(q_h + \frac{1}{6}\right)^2$$

HW. $\frac{\partial \pi}{\partial q_h} = 0 \Rightarrow ?$