PRACTICO 6 - Soluciones

Ejercicio Nicholson 19.1

$Q = 150 - P$

a) $\pi^M = PQ = (150 - Q)Q$

CPO: $\frac{\partial \pi^M}{\partial Q} = 150 - 2Q = 0$

$Q = 75$
$P = 75$
$\pi^M = 75^2 = 5625$

b) $q_1 + q_2 = 150 - P$

$\pi^i = (150 - q_i - q_j)\, q^i$

CPO: $\frac{\partial \pi^i}{\partial q^i} = 150 - 2q_i - q_j = 0$

$q_i = R(q_j) = \frac{150 - q_j}{2}$

Por simetría $q_i = q_j = \bar{q}$ $\Rightarrow$ $2\bar{q} = 150 - \bar{q}$

$\bar{q} = \frac{150}{3} = 50$

$P = 150 - 50 - 50 = 50$

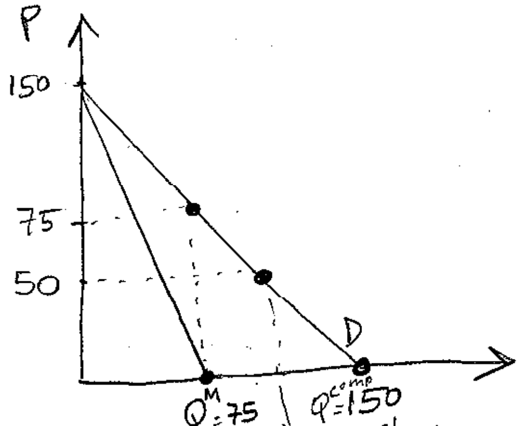
$\pi^i = 50^2 = 2500$

$\pi^{total} = 5000$

c) En competencia perfecta $P = 0$; $Q^{total} = 150$; $\pi^{total} = 0$

En monopolio: $P = 75$; $Q^{total} = 75$; $\pi^{total} = 5625$

En duopolio de Cournot: $P = 50$; $Q^{total} = 100$; $\pi^{total} = 5000$



Ejercicio Nicholson 19.2

$Q = 53 - P$ $\quad\quad$ $CMe = CMg = 5$

a) $\pi^M = (53 - Q - 5)Q$

CPO: $\frac{\partial \pi^M}{\partial Q} = 53 - 2Q - 5 = 0$

$Q = \frac{48}{2} = 24$

$P = 53 - 24 = 29$

$\pi = 576$

b) $q_1 + q_2 = 53 - P$

$\pi^i = (53 - q_i - q_j - 5) q_i$

c) CPO: $\frac{\partial \pi^i}{\partial q_i} = 53 - 2q_i - q_j - 5 = 0$

$R(q_j) = q_i = \frac{48 - q_j}{2}$ $\quad\quad$ $i = 1, 2$

d) $q_1 = \frac{48 - q_2}{2} = \frac{48 - \left(\frac{48 - q_1}{2}\right)}{2} = \frac{96 - 48 + q_1}{4}$

$q_1 = \frac{48}{3} = 16$; $q_2 = 16$

$q_1 + q_2 = 32$

e) $P = 53 - 32 = 21$

$\pi_1 = \pi_2 = (21 - 5)16 = 256$

$\pi_1 + \pi_2 = 512$

f) $q_i = R(q_1, q_2, \dots q_{i-1}\ q_{i+1} \dots, q_n) = \frac{48 - \sum_{j \neq i} q_j}{2}$

Por simetría: $q_i = q_j \ \forall\ i, j$

$$2\bar{q} = 48 - (n-1)\bar{q}$$

$$(n+1)\bar{q} = 48$$

$$\bar{q} = \frac{48}{n+1}$$

$$P = 53 - \frac{n}{n+1} \cdot 48$$

$$\Pi = \left(53 - \frac{n}{n+1}48 - 5\right)\frac{48}{n+1}$$

$$\Pi n = n\left(\frac{\cancel{48}n - \cancel{48}n + 48}{n+1}\right)\frac{48}{n+1} = \frac{48}{(n+1)^2}$$

g) $$\lim_{n\to\infty} Q^{tot} = 48\overset{\nearrow 1}{\boxed{\frac{n}{n+1}}} = 48$$

(En competencia perfecta
$P = 53 - Q = CMg = 5$
$\rightarrow Q = 48$)

$$\lim_{n\to\infty} P = 53 - \overset{\nearrow 1}{\boxed{\frac{n}{n+1}}}48 = 5 = CMg$$

$$\lim_{n\to\infty} \Pi n = \frac{48}{(n+1)^2} = 0$$

Ejercicio adicional práctico 6

$C(q) = 2q$

$P(q) = 9 - q$

a) $\underset{\{q\}}{Max}\ \pi^M = (9 - q - 2)\, q$

CPO: $9 - 2q - 2 = 0$

$\frac{7}{2} = q$

$P = \frac{18}{2} - \frac{7}{2} = \frac{11}{2} = 5.5$

$\pi^M = \left(\frac{11}{2} - 2\right) \cdot \frac{7}{2} = \frac{49}{2}$

b) Cournot

$P(q) = 9 - q_A - q_B$

$\underset{\{q_i\}}{Max}\ \pi_i = \left(9 - q_i - q_j - 2\right) q_i \qquad i = A, B$

CPO: $9 - 2q_i - q_j - 2 = 0$

$q_i = \frac{9 - q_j - 2}{2}$

Por simetría $q_i = q_j = \bar{q} \rightarrow 2\bar{q} = 7 - \bar{q}$

$\bar{q} = 7/3$

$P = 9 - 14/3 = 13/3 = 4.3$

e) Empresa Ⓐ, que es líder conjetura que función de reacción de Ⓑ (seguidor) es:

$$q_B = \frac{7-q_A}{2}$$ ← función de reacción de Ⓑ que surge de la condición de 1er orden $\frac{\partial \Pi_B}{\partial q_B} = 0$

Ⓐ maximiza $\{q_A\}$

$$\Pi_A = \left(7 - q_B(q_A) - q_A\right) q_A$$

CPO: $$\frac{\partial \Pi_A}{\partial q_A} = 7 - q_B(q_A) - 2q_A - \frac{\partial q_B}{\partial q_A} q_A = 0$$

$$7 - \frac{7-q_A}{2} - 2q_A + \frac{1}{2} q_A = 0$$

$$14 - 7 + q_A - 4q_A + q_A = 0$$

$$q_A = 7/2$$

$$q_B = \frac{7}{4}$$

$$P = 9 - 21/4 = 15/4 = 3.75$$

Los consumidores están mejor en el caso de Stackelberg, porque el precio es más cercano al costo marginal