15 Book Notes

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Homogenous Product markets

for a monopoly, MC must cross at MR(AC)
max(π) at MR=MC

Bertrand (Price) Competition w/ Homogenous Products

Players A and B are selling homogenous products

Cost = c

if B sets price P_B, as long as $P_B > c + \varepsilon$, $P_A = P_B - \varepsilon$

Simultaneous Homogenous Product Price Competition w/ Capacity Choice

$Q = q_A + q_B$

$\bar{q}$ = capacity

$P = P(\bar{q}_A + \bar{q}_B)$

$\pi_A = P q_A - C(q_A) \rightarrow \pi_A = P(\bar{q}_A + \bar{q}_B)\bar{q}_A - k\bar{q}_A - c\bar{q}_A$

Simultaneous Quantity (Cournot) Competition

$\pi_A = P(q_A + q_B)q_A - C(q_A)$

Example:
cost/unit = $5 demand: P(Q) = 20 - .25Q

monopoly:
$\pi_{mon} = (20 - .25Q)Q - 5Q$
derivative
$MR = 20 - \frac{Q}{2} = 5 = MC$
$\frac{Q}{2} = 15 \rightarrow Q = 30$
$P = 20 - .25(30) = 12.5$
$\pi_{mon} = 30(12.5 - 5) = 225$

oligopoly:
$\pi_A = (20 - .25(q_A + q_B))q_A - 5q_A$
$\frac{d\pi_A}{dq_A} = 20 - .25q_A - .25q_B - .25q_A - 5 = 0$
$20 - .25q_B - .5q_A = 5$
$15 - .25q_B = .5q_A$
$q_A = R_A(q_B) = 30 - .5q_B$
b, flip for q_B
R_A is the reaction function

First mover (Stackelberg) Quantity Competition

since A moves first, $q_B = R_B(q_A)$
$\pi_A = P(q_A + R_B(q_A))q_A - C(q_A)$

Long-Run Equilibrium