Dylan Black
ECON2316

Lecture 15: Monopoly Regulation and Monopolistic Competition

Finding MR in a monopoly

$Q_d = 10 - 2P$, what is MR?

$TR = PQ = Q \cdot \left(\frac{10-Q}{2}\right)$

$= \frac{10Q - Q^2}{2}$

$= 5Q - \frac{1}{2}Q^2$ ← $\frac{\partial TR}{\partial Q}$

$MR = 5 - Q$

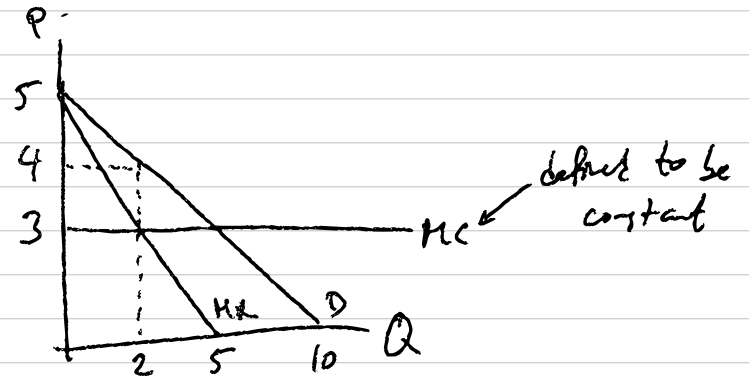
$Q_d = 10 - 2P$

$Q_d + 2P = 10$

$P = \frac{10 - Q_d}{2}$ ← inverse demand

$MC = 3 \Rightarrow$ what is Price?

$\underbrace{5 - Q = 3}_{MR = MC} \Rightarrow Q = 2, \; P = \frac{10-2}{2} = 4$



defined to be constant

Example: inverse demand

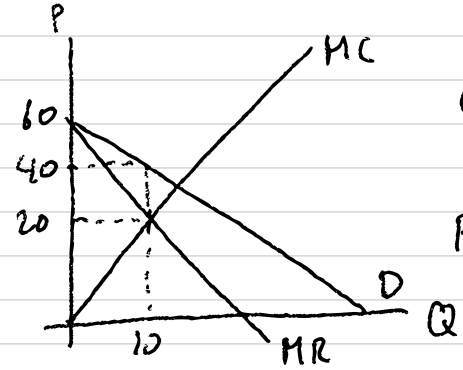
$P = 60 - 2Q$ $\quad TC = 50 + Q^2$

What are CS and PS in monopoly?

$TR = Q(60-2Q) = 60Q - 2Q^2$ $\quad MC = 2Q$

$MR = 60 - 4Q$

$60 - 4Q = 2Q \Rightarrow Q = 10, P = 40$



$CS = \frac{1}{2}(20)(10)$
$= 100$

$PS = 20(10) + \frac{1}{2}(20)(10)$
$= 300$
or
$TR - VC$
$= PQ - Q^2$
$= 400 - 100$
$= 300$

Can you figure out how many firms ex.?

$P = 60 - 2Q$, $TC = 50 + q^2$

9 identical perfectly competitive firms

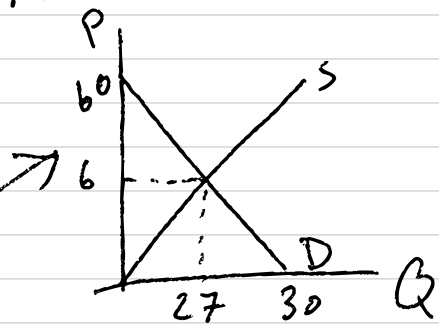
What are CS and PS here?

• Find firm supply

$MC = 2q$, since $P = MC$ in P.C.

$P = 2q \Rightarrow q_s = \frac{P}{2} \Rightarrow Q_s = 4.5P$

Market:



Market Demand

$P = 60 - 2Q$

$P + 2Q = 60$

$2Q = 60 - P$

$Q_d = 30 - 0.5P$

$30 - 0.5P = 4.5P \Rightarrow P = 6$

$CS = \frac{1}{2}(27)(54) = 729$

$PS = \frac{1}{2}(6)(27) = 81$

$TS = 810$

Cost-Plus Pricing

To maximize profit - need to know MC, ε_d

if MR = MC, we can show:

$$P = \frac{MC}{\left(1 + \frac{1}{\varepsilon_d}\right)}$$

Maximizing Profit: set derivative of profit = 0

$\pi = PQ - TC$

$\frac{\partial \pi}{\partial q} = \underbrace{\frac{dP}{dq} \cdot q + P}_{\text{product rule}} - MC = 0 \quad | \div P$

Recall! $\varepsilon_d = \frac{P}{Q}\frac{dQ}{dP}$

$\frac{dP}{dq} \cdot \frac{q}{P} + 1 = \frac{MC}{P}$ ← $\frac{dP}{dq} \cdot \frac{q}{P} \leftarrow 1/\varepsilon_p^D$

$\frac{1}{\varepsilon} + 1 = \frac{MC}{P}$

$\frac{P - MC}{P} = \frac{1}{-\varepsilon_p^D}$

$\frac{1}{\varepsilon} = \frac{MC}{P} - \frac{P}{P}$

$\frac{1}{\varepsilon} = \frac{MC - P}{P} = \frac{-(P - MC)}{P}$

$P = \frac{MC}{1 + \frac{1}{\varepsilon_d}}$

Lerner index $= \frac{P - MC}{P} = \frac{-1}{\varepsilon_d} = L$

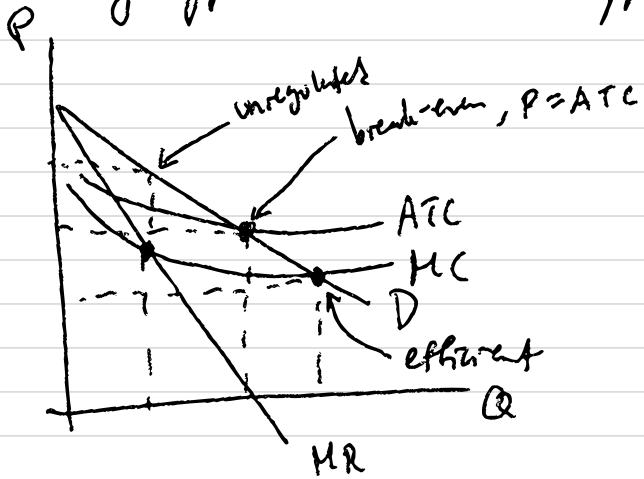
↑ markup relative to market clearing P

Natural Monopoly

- one firm making sense
- producing output at a lower ATC than if we had 2+ firms

Cost Structure
- → high fixed costs
- → heavy economies of scale ★

Ex.
- utility suppliers (ie. a water supplier)

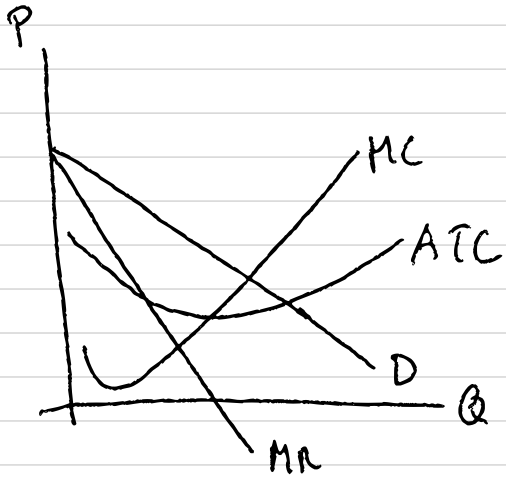


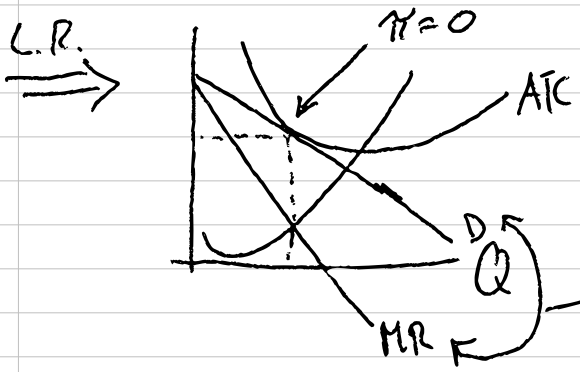
Anti-trust law

Prohibitions against:
- Parallel conduct - implicit collusion
- Predatory pricing
- Price fixing
- Price discrimination
- etc...

Monopolistic Competition

- differentiated products
- many firms
- free entry + exit in LR
- Profit in LR = 0





D & MR SHIFT LEFT, ATC DOESN'T MOVE

Oligopoly

- few firms
- high barriers

Monopolistically competitive firm behaves like a monopolist
- MR = MC
- chooses highest possible price

In LR - D↓ b/c of competition