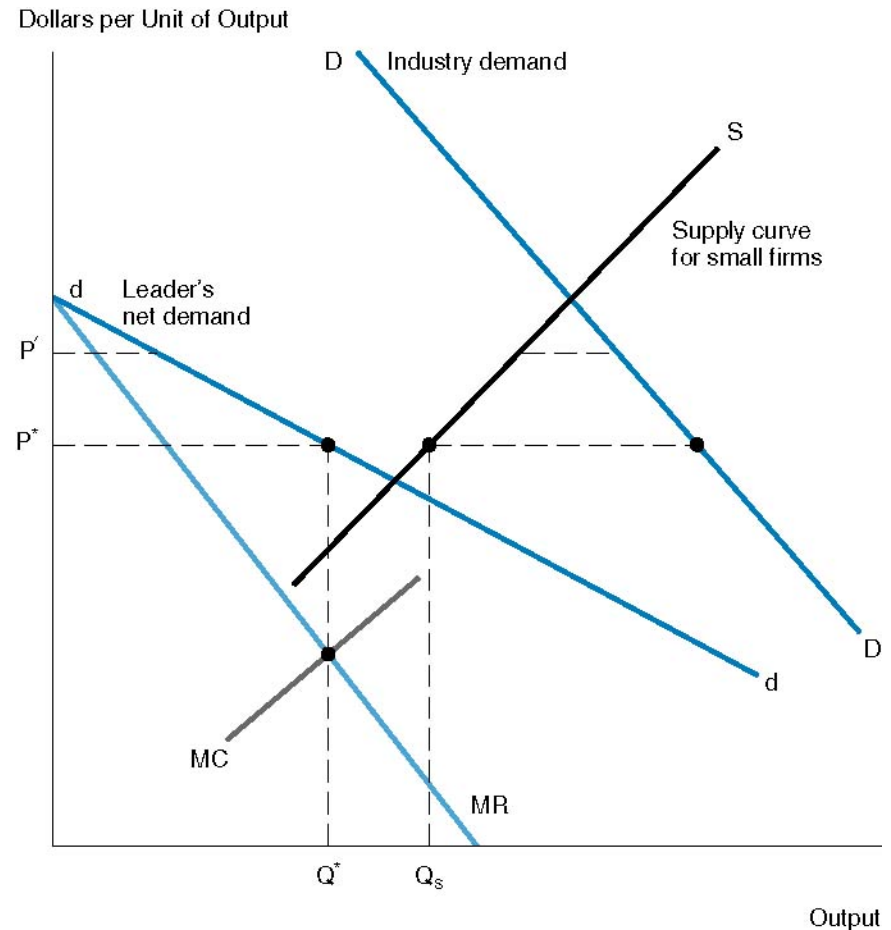


SECTION # 6

- Extra office hours on Wed (2-3:30 p?)
- Dominant firm/fringe firm (PS5, Q4)
- Oligopolistic competition (Cournot PSX5, Q2)
- Double marginalization (PSX6, Q2)
- Short run and long run dynamics (PSX4 Q7)
- Exam advice

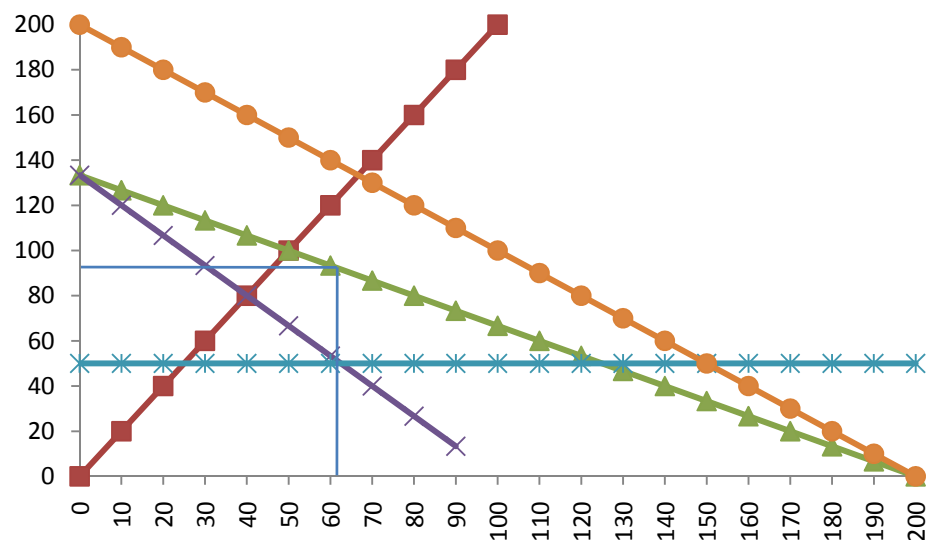
Dominant firm model

- One firm possesses a dominant market share and acts as a leader by setting price
- Remaining small firms have no influence on price and behave competitively (behave as price takers and sell all they want at price set by dominant firm)
- To set optimal P , dominant firm must figure out its demand curve (d)
- d is the difference b/w market demand (D) and supply curve of fringe firms (S)
- Once it finds d , the dominant firm faces the usual monopoly optimization problem
- Industry price = P^* , Industry quantity = $Q^* + Q_s$



PS5, Q4

- Demand for electricity in northern California is $Q = 200 - P$
- Aggregate supply curve of competitive fringe producers is $Q = P/2$
- PWR's $TC = 1000 + 50q$



(a) If PWR does not produce, what is equilibrium price & quantity

- Competitive equilibrium price equates quantity demanded to quantity supplied by fringe suppliers
- $200 - P = P/2 \Rightarrow P = 133.33 \Rightarrow Q = 66.67$

(b) What are P & Q if PWR was only producer?

- $MR = MC \Rightarrow 200 - 2Q = 50 \Rightarrow Q = 75 \Rightarrow P = 125$

(c) Residual demand curve

- $Q_R = (200 - P) - (P/2) = 200 - 3P/2$

(d) With both PWR and the small competitive fringe suppliers, what are P & Q?

- $P = 133.33 - 2Q/3 \Rightarrow MR = 133.33 - 4Q/3$
- $MR = MC \Rightarrow 133.33 - 4Q/3 = 50 \Rightarrow Q_{pwr} = 62.50 \Rightarrow P = 91.66$
- $Q_f = 91.66/2 = 45.83, Q_{total} = 108.33, \pi = 62.5 \times 91.66 - (1000 + 50 \times 62.5) = 1603.75$

Cournot model

- Each firm treats output level of competitor as given & decides how much to produce
- Firm A's π -maximizing output is a decreasing schedule of Firm-B's output
- In a duopoly, if firm A produces 0, then firm-B faces market demand curve
- Cournot may be more likely in industries where firms make capacity decisions ahead of production, Bertrand requires firms to adjust output quickly

PSX5 Q2 A and B make identical goods and compete on quantities

- Market demand is $P = 1300 - Q$
- $MC_A = MC_B = 100$

(A) If $Q_A=100$, what is B's residual demand and best response output?

- B faces residual demand $Q_B = 1300 - P - 100 = \underline{1200 - P}$.
- $P = 1200 - Q_B \Rightarrow MR = 1200 - 2Q_B$.
- $MR = MC \Rightarrow 1200 - 2Q_B = 100 \Rightarrow \underline{Q_B = 550}$

(B) If A produces Q_A what is B's residual demand and best response output?

- $Q_B = ((1300 - P) - Q_A) \Rightarrow P = 1300 - Q_A - Q_B \Rightarrow$
- $TR = Q_B \cdot (1300 - Q_A - Q_B) = 1300Q_B - Q_A Q_B - Q_B^2 \Rightarrow MR = 1300 - Q_A - 2Q_B$.
- Setting $MR = MC (100)$ and solving for B's quantity, $\Rightarrow \underline{Q_B = 600 - Q_A/2}$

(C) What are Cournot-Nash equilibrium quantities & profits?

- From (B) $Q_B = 600 - Q_A/2$. Similarly, solving for A's best response, $Q_A = 600 - Q_B/2$.
- Solving the two best-response functions simultaneously gives $Q_A = Q_B = 400$
- $Q_{\text{total}} = 800$. $P = 1300 - Q_{\text{total}} = 1300 - 800 = 500$
- $\pi = (500 - 100) \cdot 400 = 160,000$

(D) How do things change with asymmetric costs?

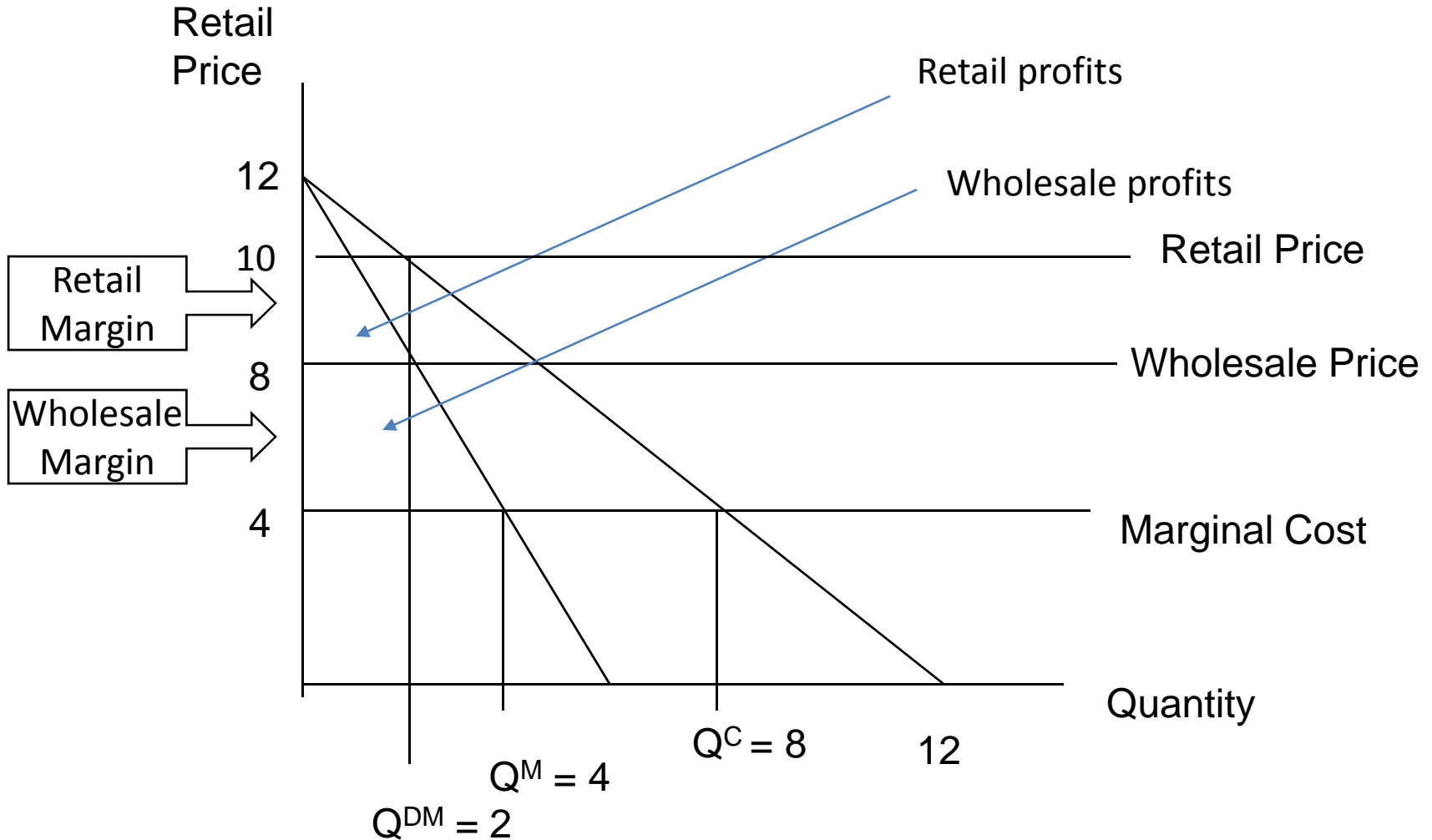
M.C. of B drops to 40, A remains 100

- $Q_A = 600 - Q_B/2$ (Q_A is not changing, because A is still setting $MR_A = MC_A$)
- MC_B changes. So resolving, $MR_B = MC_B (40)$, we get $Q_B = 630 - Q_A/2$
- Solving two best responses as in (C), we get $Q_B = 440$, $Q_A = 380$, $P = 480$.
- BRF of B shifts out and of A does not change.

(E) With B's MC back to 100, A faces capacity constraint of 300 units per period (i.e. $Q_A = 300$)

- B's best response is $Q_B = 600 - Q_A/2 = 450$,
- $Q_{\text{total}} = 750$ and $P = 1300 - Q_{\text{total}} = 1300 - 750 = 550$.

Double Marginalization



Double Marginalization

- 2 independent firms, upstream & downstream, *each* having market power
- Each firm prices a mark-up over Marginal Cost.
- Pricing above MC yields *deadweight losses* (incurred *twice*)
- How to solve the problem of double marginalization?
 - If upstream & downstream merge, then upstream ceases to capture surplus from downstream (upstream prices (transfers) at MC).
 - One source of deadweight loss eliminated!
 - 2-part pricing
 - The wholesaler can set the wholesale price at marginal cost
 - It can then use upfront fee to capture the bulk of this additional value created.
 - Price ceilings, quantity “forcing”

PS X6, Q2 Consumer demand $Q = 100,000 - 500P$ where P is in cents and q is in gallons

- Cost of refining oil into gasoline is 50 cents per gallon
 - Cost of retailing a gallon of gasoline is 10 cents per gallon
 - Refining company does not sell to consumers directly.
 - It sells to a single retailer who then resells to consumers
-

(A) If retailer just marked up the refiner's wholesale price by its retailing cost (10 c), then what would refiner charge?

- $MC = 60$ cents
- Solve $MR = MC \Rightarrow Q = 35000$ gallons, $P = \$1.30$. $\pi = \$24,500$
- Refiner sells retailer at \$1.20 and retailer $\pi = 0$.

(B) If refiner charged at \$1.20, would the retailer really just mark it up by 10 cents?

- No! Retailer $MC = \$1.30$.
- Solve $MR = MC \Rightarrow Q = 17,500$ gallons, $P = \$1.65$.
- $\pi_{\text{RETAILER}} = \$6,125$ $\pi_{\text{REFINER}} = \$12,250$

(C) Compare A and B, and note that double marginalization has lowered total industry profits, as well as consumer surplus!

Short run, long run D & S dynamics

- Changes in consumer income, price of substitutes and complements, shift demand curve (see PSX4, Q5)
 - When demand shifts right, market clears at higher P, higher Q
 - Q5a Increase in price of oil shifts demand for coal right-ward
- Changes in cost of raw materials, improvements in technology, entry of new firms, shift the supply curve
 - When supply shifts right, market clears at lower P, higher Q
 - In Q5b, positive profits force entry, investment in capacity, and lower equilibrium price (as compared to a) in the long-run
- Think through Q5c (imposition of price controls) & Q7 (imposition of cage size standards) on short and long run equilibrium.

Exam advice

- Read all questions first before answering
 - Easy, one-line answer Q-s occur randomly
- Be clear and crisp in answering concept Qs.
- If you aren't sure how to work out a numerical problem, but think you understand it conceptually, show us!
- Wish you the very best (for the exams and the long-run!)