
Econ 100A: Intermediate Microeconomic Analysis Lecture 22

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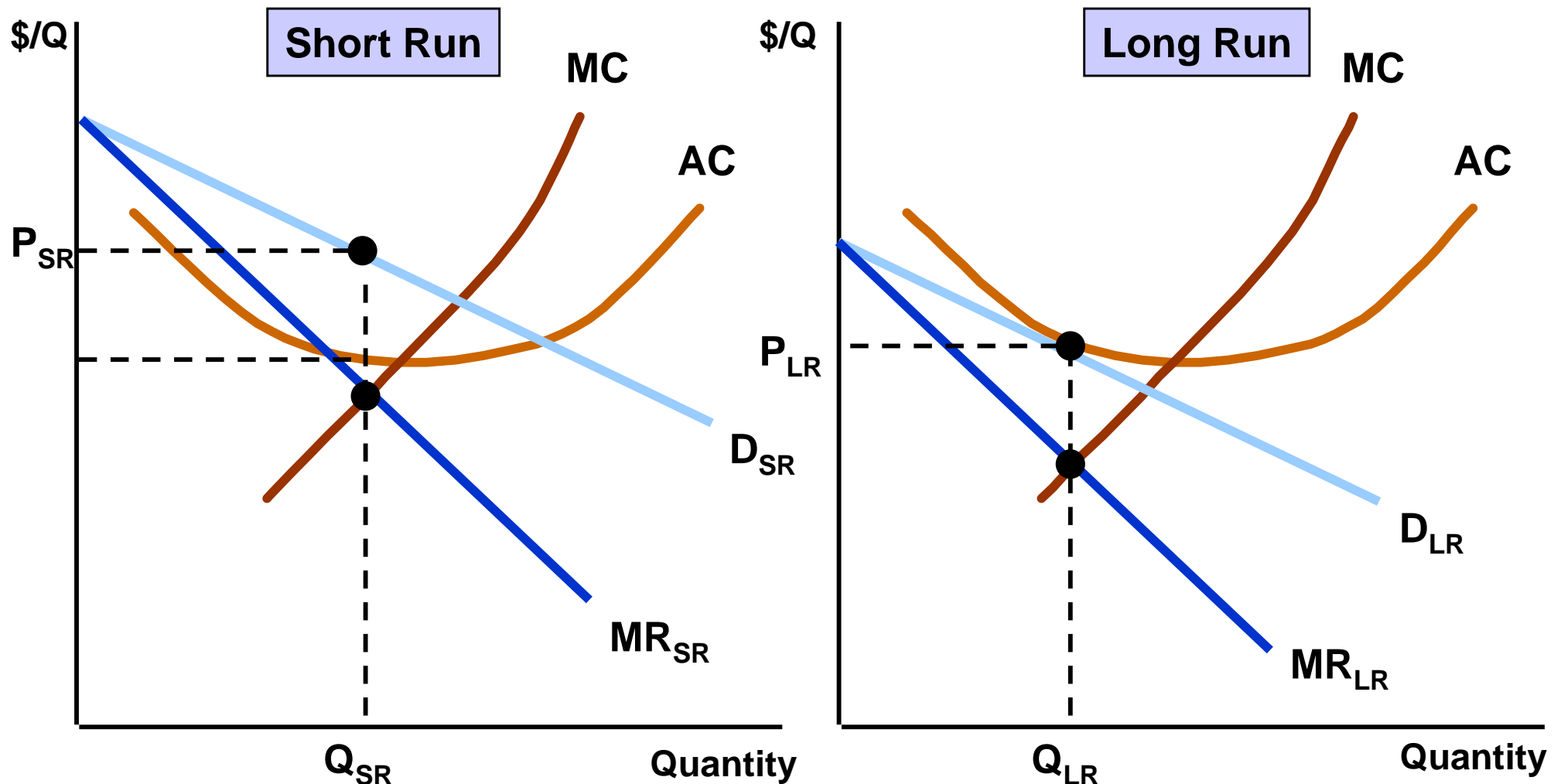
Plan of Today's Lecture

- Midterm 2 results:
 - MT 2: min 12, max 110, MEAN 76, STD 23
 - MT 1&2 comb.: min 26, max 110, MEAN=82 STD=19
- Ch. 12
- Monopolistic Competition
- Oligopoly
 - Output Competition
 - Cournot
 - Stackelberg
 - Price Competition (Bertrand)
- The Prisoners' Dilemma & Oligopolistic Pricing
- Cartels

Monopolistic Competition

- Market Characteristics
 1. Many firms
 2. Free entry and exit
 3. Differentiated product
- The amount of monopoly power depends on the degree of differentiation
- Examples of this very common market structure include:
 - Toothpaste, Soap
 - Soft Drinks (Coke & Pepsi)
 - Clothing (Sweaters, T-shirts)
- Important product and production technology characteristics
 - Differentiated but highly substitutable products
 - Free entry and exit

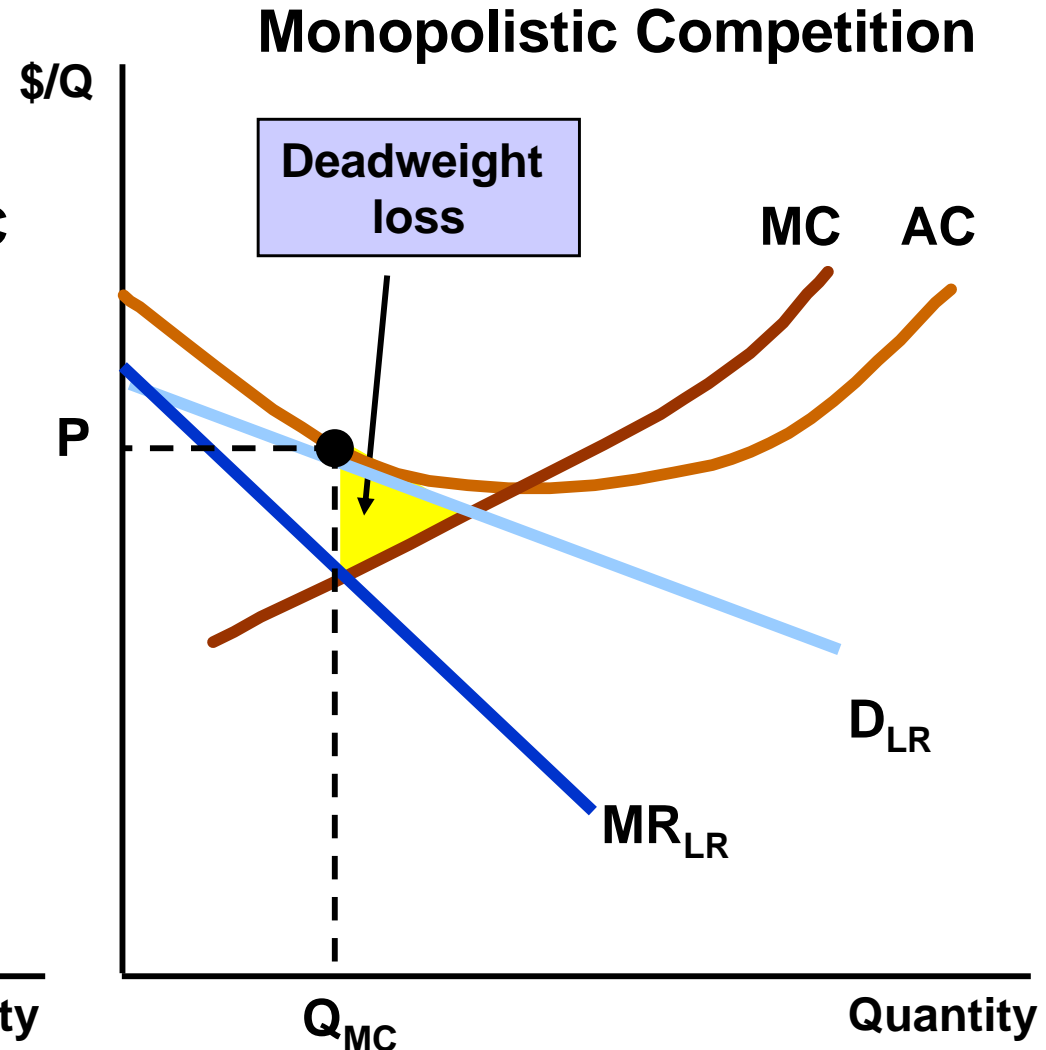
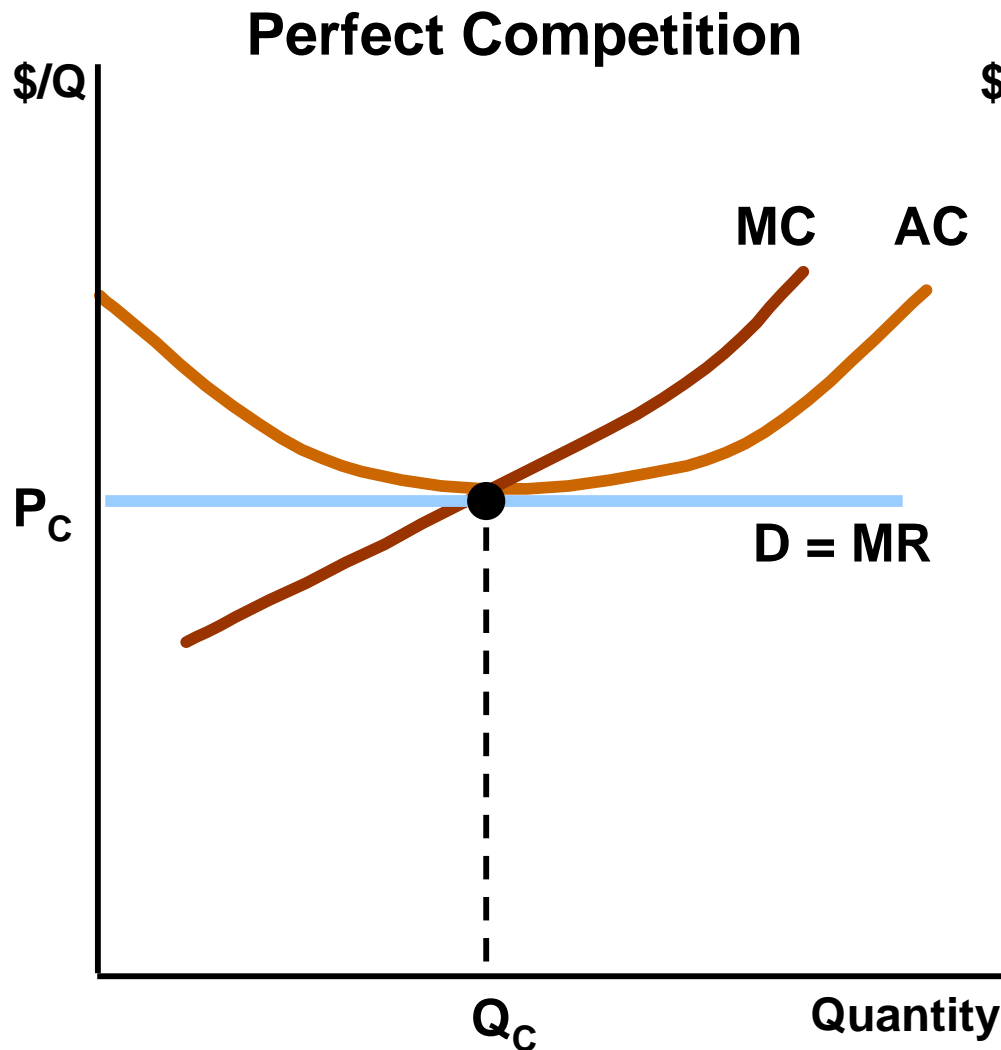
A Monopolistically Competitive Firm in the SR and LR



A Monopolistically Competitive Firm in the SR and LR

- Short run [SR]
 - Downward sloping demand – differentiated product
 - Demand is relatively elastic – good substitutes
 - $MR < P$
 - Profits are maximized when $MR = MC$
 - This firm is making economic profits
- Long run [LR]
 - Profits will attract new firms to the industry (no barriers to entry)
 - The old firm's demand will decrease to DLR
 - Firm's output and price will fall
 - Industry output will rise
 - No economic profit ($P = AC$)
 - $P > MC \rightarrow$ some monopoly power

Perfectly & Monopolistically Competitive Equilibrium (LR)



Oligopoly – Characteristics

- Small number of firms
- Product differentiation may or may not exist
- Barriers to entry
 - Scale economies
 - Patents
 - Technology
 - Name recognition
 - Strategic action
- Examples
 - Automobiles
 - Airlines
 - Financial Intermediaries (Visa, MasterCard)
- Small number of players → strategy is important

Oligopoly – Equilibrium

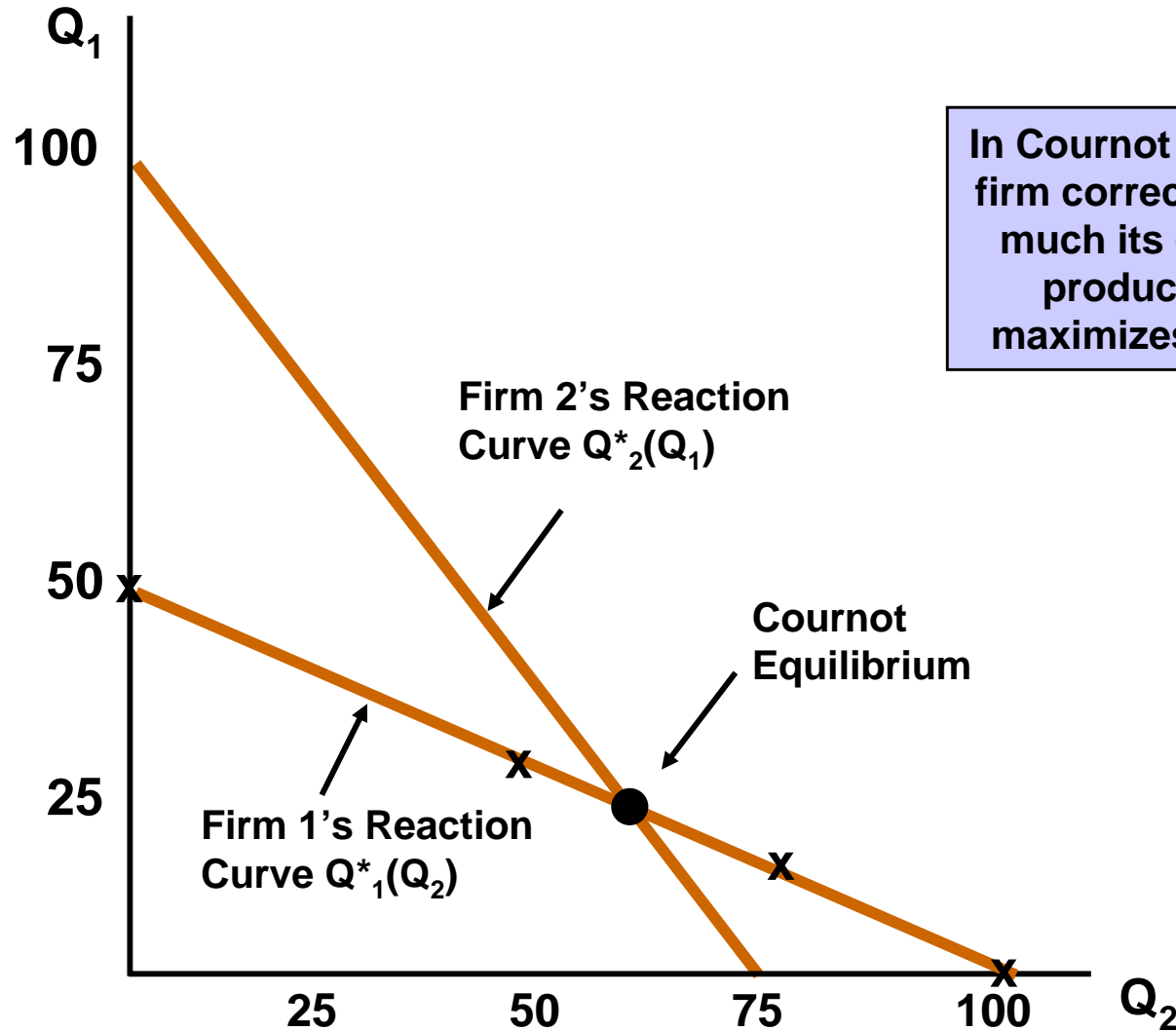
- Defining Equilibrium
 - Firms are doing the best they can and have no incentive to change their output or price
 - All firms assume competitors are taking rival decisions into account
- **Nash Equilibrium**
 - Each firm is doing the best it can given what its competitors are doing
- We will focus on **duopoly**
 - Markets in which two firms compete

Oligopoly: Output Competition

The Cournot Model

- In Cournot Model, each firm
 - produces a homogeneous good
 - treats its competitors' output as fixed
 - decides on output simultaneously with other firms
- The Reaction Curve
 - The relationship between a firm's profit-maximizing output and the amount it thinks its competitor will produce
 - Firm 1 profit-maximizing output is a decreasing schedule of the expected output of Firm 2
- Each firm's reaction curve tells it how much to produce given the output of its competitor

Reaction Curves and Cournot Equilibrium



In Cournot equilibrium, each firm correctly assumes how much its competitors will produce and thereby maximizes its own profits.

Oligopoly: Output Competition

The Stackelberg Model

- The Stackelberg Model (First Mover Advantage):

Oligopoly model in which one firm sets its output before other firms do

- Assume that Firm 1 sets output first and Firm 2 second, only after seeing Firm 1's output.
- Then: Going first allows Firm 1 to produce a large quantity. Firm 2 must take that into account and produce less unless it wants to reduce profits for everyone.
- The Stackelberg Model, when relation between P and Q is linear and MC is constant:
 - Going first gives Firm 1 the advantage
 - Firm 1's output is twice as large as Firm 2's
 - Firm 1's profit is twice as large as Firm 2's

Oligopoly: Price Competition

The Bertrand Model

- **In Bertrand Model**, each firm
 - produces a homogeneous good
 - treats the price of its competitors as fixed
 - decides on what price to charge simultaneously with its competitors
- Bertrand model, in equilibrium: $P=MC$
- Cournot vs Bertrand:
 - Both are models of oligopolistic industry:
 - Cournot is competition in output
 - Bertrand is competition in price

Competition Versus Collusion: The Prisoners' Dilemma

- **Nash equilibrium** is a *noncooperative* equilibrium: each firm makes decision that gives it the highest profit, given actions of competitors
- Although collusion is illegal, why don't firms cooperate without explicitly colluding?
 - Competitor is not likely to follow, because they can do better by choosing a lower price, even (if they know that you price at the collusive level)
 - We will use an example to understand the firms' choices better

Payoff Matrix for Pricing Game: Prisoner's Dilemma

Assume $P = 10 - Q$ & $MC = 2$

If a monopolist →

$Q_m = 4, P_m = 6$

If Bertrand →

$Q_b = 8, P_b = 2$

Firm 2

Charge \$2

Charge \$6

Charge \$2

Firm 1

Charge \$6

	Charge \$2	Charge \$6
Charge \$2	\$0, \$0	\$16, \$-4
Charge \$6	\$-4, \$16	\$8, \$8

Payoff Matrix for Prisoners' Dilemma

		<i>Prisoner B</i>	
		Confess	Don't confess
<i>Prisoner A</i>	Confess	-5, -5	-1, -10
	Don't confess	-10, -1	-2, -2

Would you choose to confess?

Oligopolistic Markets

Conclusions

1. Collusion will lead to greater profits
2. Explicit and implicit collusion is possible
3. Even when collusion exists, the profit motive to break it and lower the price is significant
4. In some markets, with time, pricing behavior creates a predictable pricing environment → implied collusion may occur. Price rigidity is characteristic of oligopolistic markets: firms are reluctant to change prices even if costs or demands change:
 - Fear that lower prices will send wrong message to competitors, leading to price war
 - Higher prices may cause competitors to raise theirs
5. In other markets, the firms are very aggressive → collusion is not possible

Cartels

- Producers in a cartel explicitly agree to cooperate in setting
 - prices
 - output
- Typically only a subset of producers are part of the cartel; non-members benefit from the choices of the cartel
- If demand is sufficiently (i) inelastic and (ii) cartel is enforceable, prices may be well above competitive levels

Cartels – Conditions for Success

1. Stable cartel organization must be formed – price and quantity settled on and adhered to.
Problems to enforce (sustain) cartel:
 - Members have different costs, assessments of demand and objectives
 - Tempting to cheat by lowering price to capture larger market share
 2. Potential for monopoly power
 - Even if cartel can succeed, there might be little room to raise prices if it faces highly elastic demand
 - If potential gains from cooperation are large, cartel members will have more incentive to make the cartel work
- Members of cartel must take into account the actions of non-members when making pricing decisions

Summary of Today & Plan of Next Lecture

- Ch. 12 material:
- Monopolistic Competition
- Oligopoly:
 - Output Competition
 - The Cournot Model, if firm output decisions are simultaneous
 - The Stackelberg Model, if the leader firm decides on output first, and the follower - second
 - Price Competition (The Bertrand Model)
- Competition Versus Collusion: The Prisoners' Dilemma
 - Prisoners' Dilemma and Oligopolistic Pricing
- Cartel = explicit agreement on price and output
- Next lecture: Continue with Ch. 12 - 13