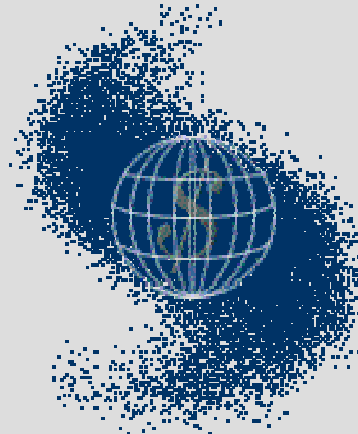


Managerial Economics & Business Strategy

Chapter 8

Managing in Competitive, Monopolistic, and Monopolistically Competitive Markets



Overview

I. Perfect Competition

- Characteristics and profit outlook.
- Effect of new entrants.

II. Monopolies

- Sources of monopoly power.
- Maximizing monopoly profits.
- Pros and cons.

III. Monopolistic Competition

- Profit maximization.
- Long run equilibrium.

Perfect Competition Environment

- Many buyers and sellers.
- Homogeneous (identical) product.
- Perfect information on both sides of market.
- No transaction costs.
- Free entry and exit.

Key Implications

- Firms are “price takers” ($P = MR$).
- In the short-run, firms may earn profits or losses.
- Long-run profits are zero.

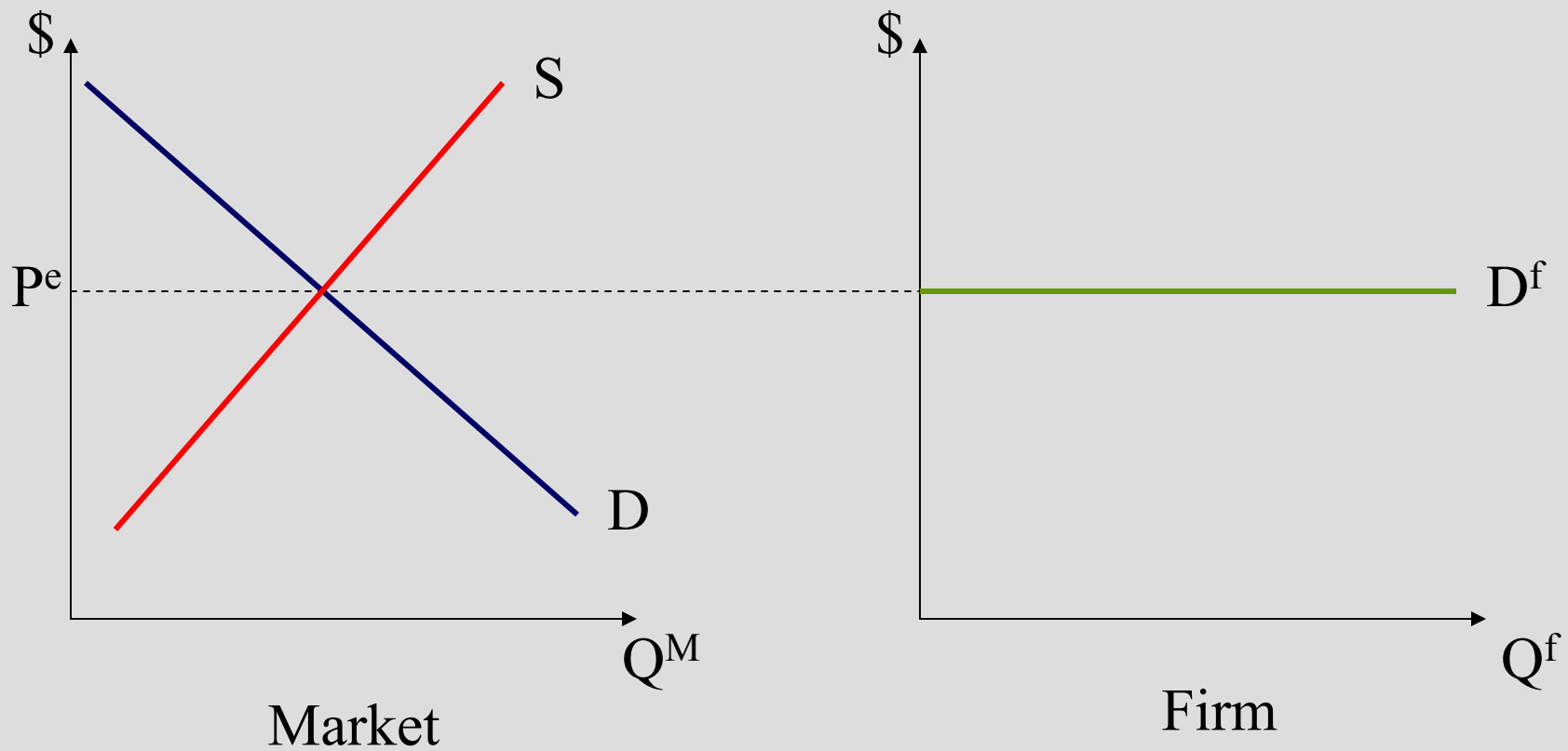
Unrealistic? Why Learn?

- Many small businesses are “price-takers,” and decision rules for such firms are similar to those of perfectly competitive firms.
- It is a useful benchmark.
- Explains why governments oppose monopolies.
- Illuminates the “danger” to managers of competitive environments.
 - Importance of product differentiation.
 - Sustainable advantage.

Managing a Perfectly Competitive Firm (or Price-Taking Business)



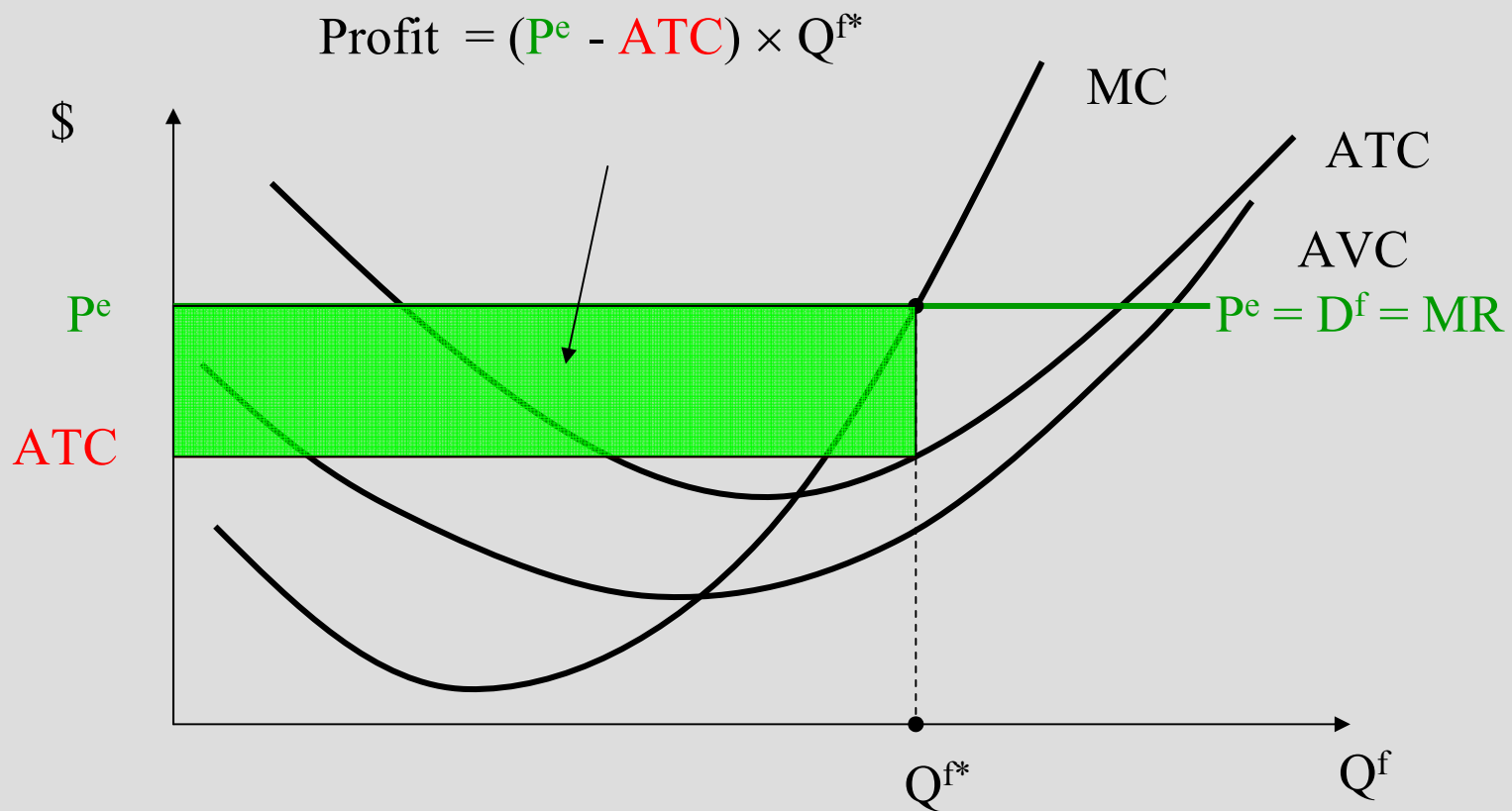
Setting Price



Profit-Maximizing Output Decision

- $MR = MC$.
- Since, $MR = P$,
- Set $P = MC$ to maximize profits.

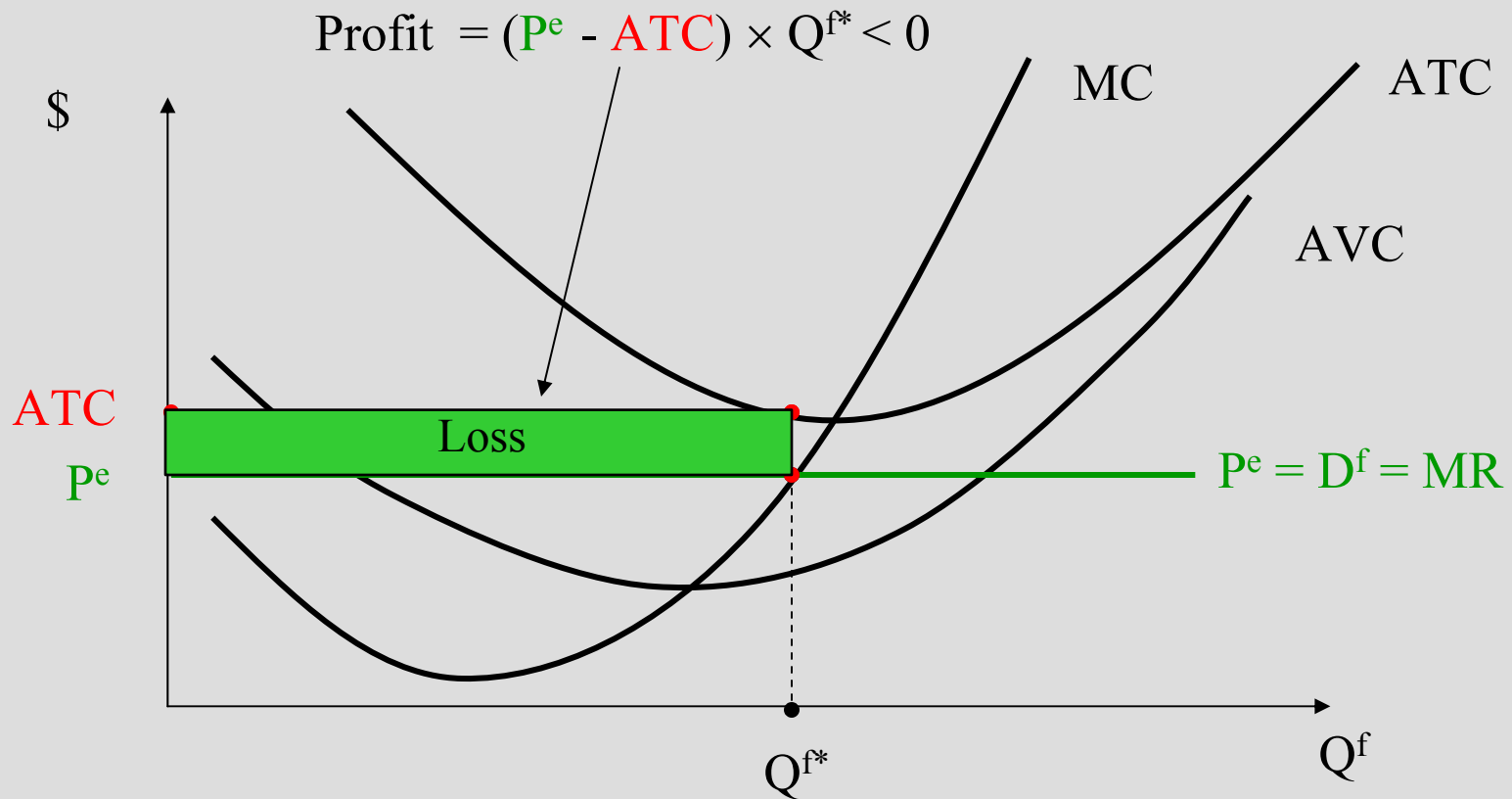
Graphically: Representative Firm's Output Decision



A Numerical Example

- Given
 - $P = \$10$
 - $C(Q) = 5 + Q^2$
- Optimal Price?
 - $P = \$10$
- Optimal Output?
 - $MR = P = \$10$ and $MC = 2Q$
 - $10 = 2Q$
 - $Q = 5$ units
- Maximum Profits?
 - $PQ - C(Q) = (10)(5) - (5 + 25) = \20

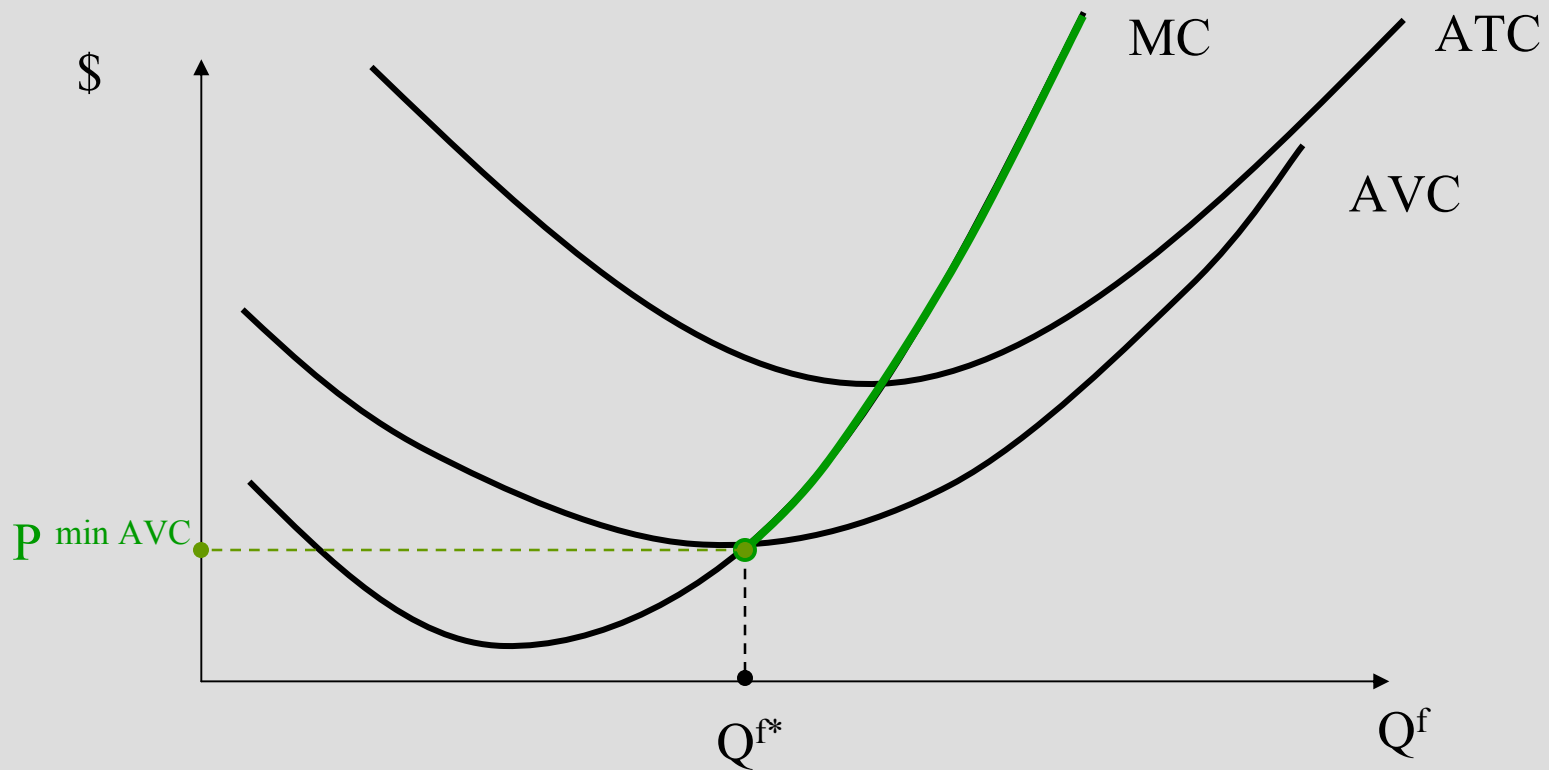
Should this Firm Sustain Short Run Losses or Shut Down?



Shutdown Decision Rule

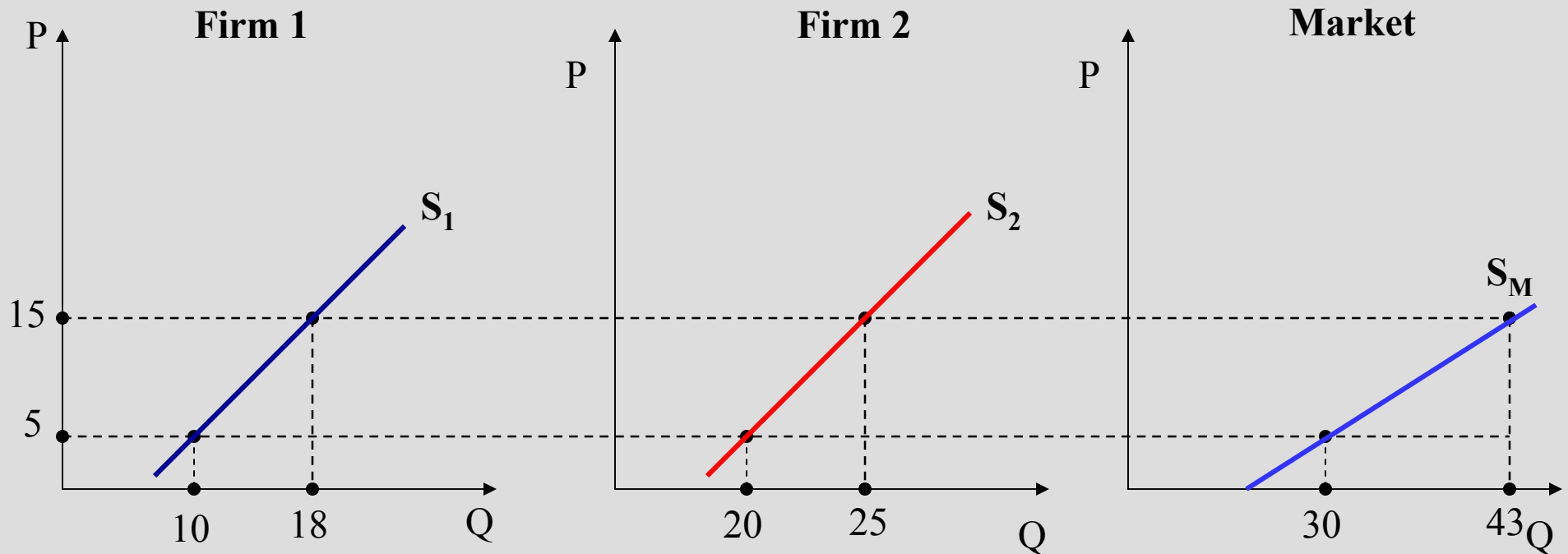
- A profit-maximizing firm should continue to operate (sustain short-run losses) if its *operating loss* is less than its *fixed costs*.
 - Operating results in a smaller loss than ceasing operations.
- Decision rule:
 - A firm should shutdown when $P < \min AVC$.
 - Continue operating as long as $P \geq \min AVC$.

Firm's Short-Run Supply Curve: MC Above Min AVC



Short-Run Market Supply Curve

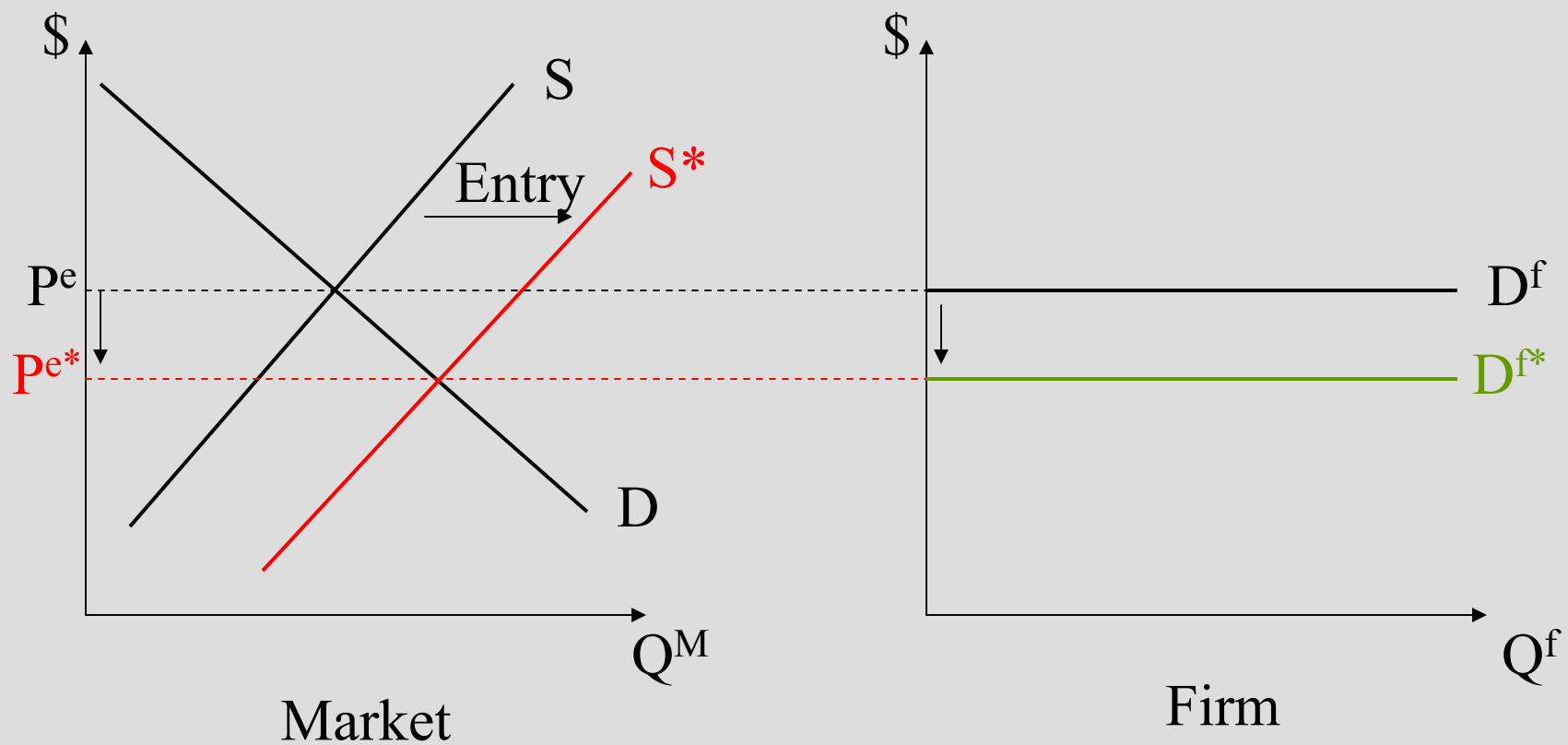
- The market supply curve is the summation of each individual firm's supply at each price.



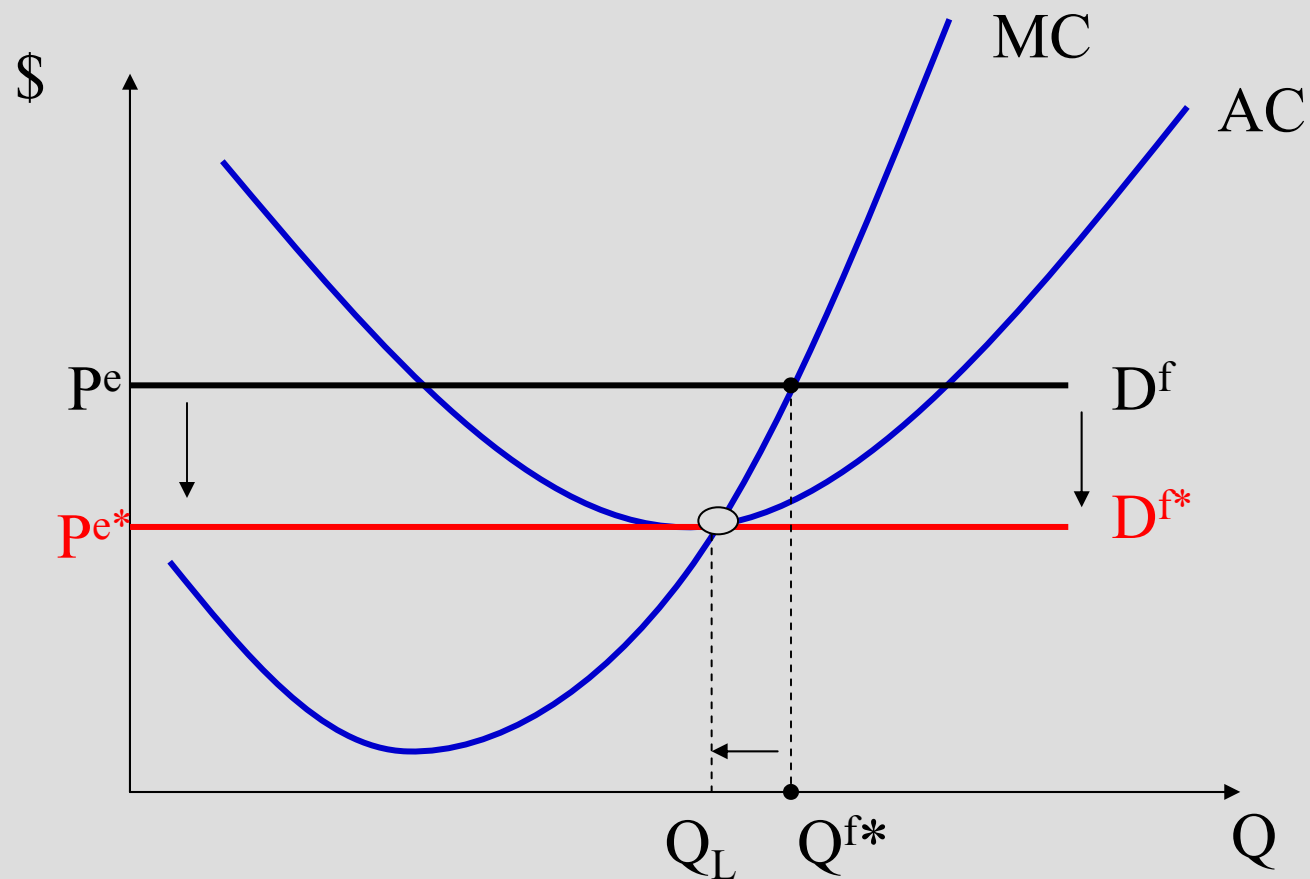
Long Run Adjustments?

- If firms are price takers but there are **barriers to entry**, profits will persist.
- If the industry is perfectly competitive, firms are not only price takers but there is **free entry**.
 - Other “greedy capitalists” enter the market.

Effect of Entry on Price?



Effect of Entry on the Firm's Output and Profits?



Summary of Logic

- Short run profits leads to entry.
- Entry increases market supply, drives down the market price, increases the market quantity.
- Demand for individual firm's product shifts down.
- Firm reduces output to maximize profit.
- Long run profits are zero.

Features of Long Run Competitive Equilibrium

- $P = MC$
 - Socially efficient output.
- $P = \text{minimum } AC$
 - Efficient plant size.
 - Zero profits
 - Firms are earning just enough to offset their opportunity cost.

Monopoly Environment

- Single firm serves the “relevant market.”
- Most monopolies are “local” monopolies.
- The demand for the firm’s product is the market demand curve.
- Firm has control over price.
 - But the price charged affects the quantity demanded of the monopolist’s product.

“Natural” Sources of Monopoly Power

- Economies of scale
- Economies of scope
- Cost complementarities



“Created” Sources of Monopoly Power

- Patents and other legal barriers (like licenses)
- Tying contracts
- Exclusive contracts
- Collusion

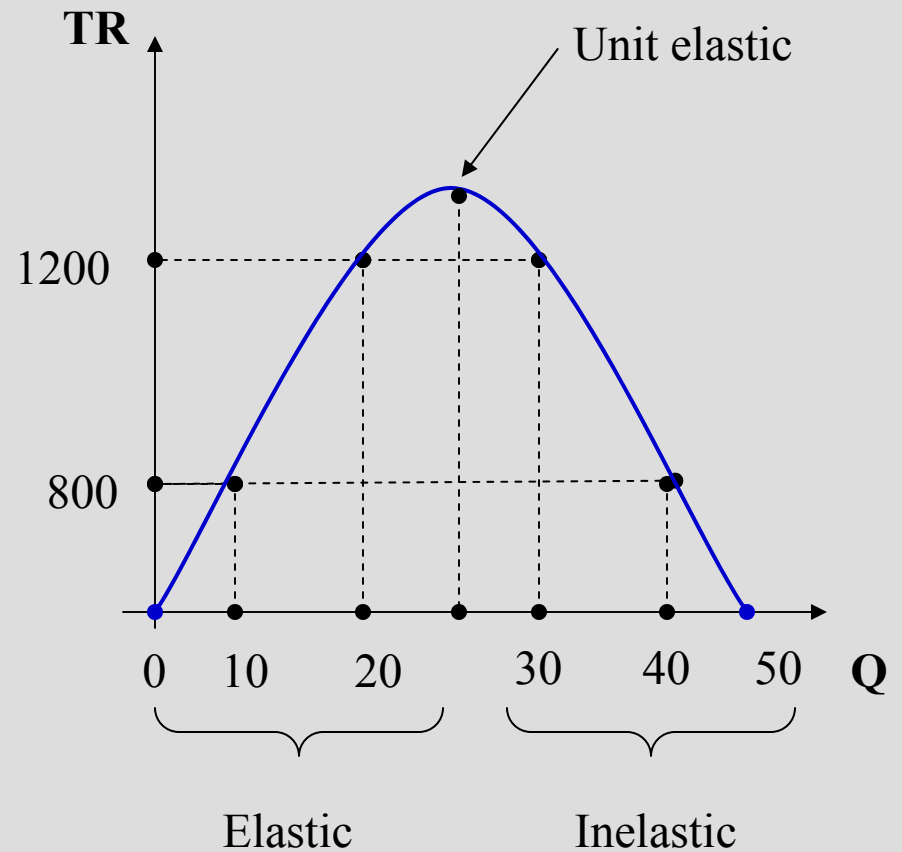
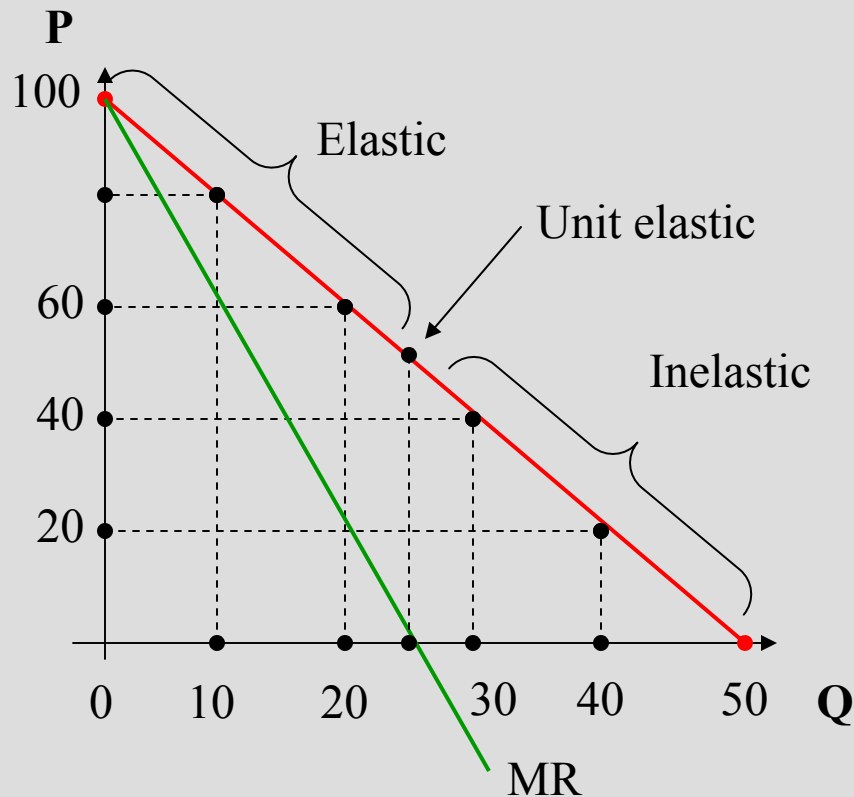


Managing a Monopoly

- Market power permits you to price above MC
- Is the sky the limit?
- No. How much you sell depends on the price you set!



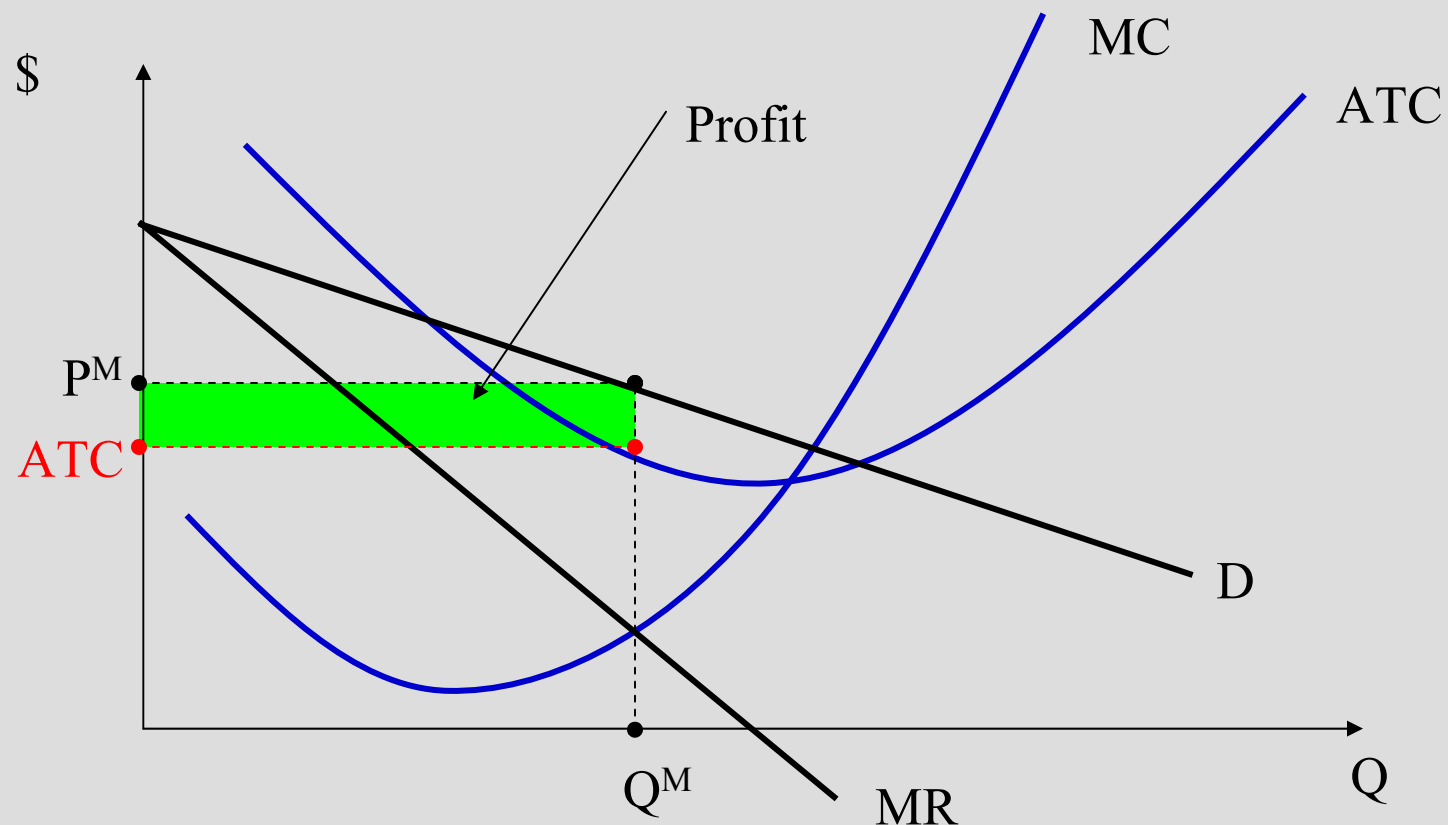
A Monopolist's Marginal Revenue



Monopoly Profit Maximization

Produce where $MR = MC$.

Charge the price on the demand curve that corresponds to that quantity.



Useful Formulae

- What's the MR if a firm faces a linear demand curve for its product?

$$P = a + bQ$$

$$MR = a + 2bQ, \text{ where } b < 0.$$

- Alternatively,

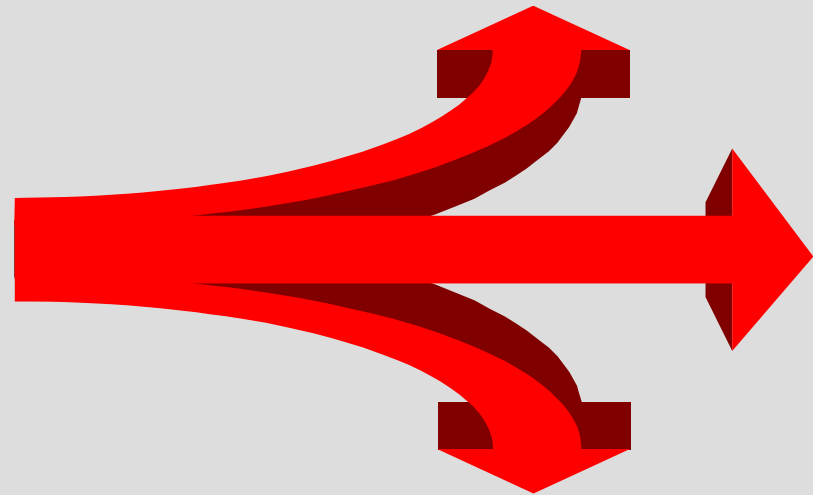
$$MR = P \left[\frac{1 + E}{E} \right]$$

A Numerical Example

- Given estimates of
 - $P = 10 - Q$
 - $C(Q) = 6 + 2Q$
- Optimal output?
 - $MR = 10 - 2Q$
 - $MC = 2$
 - $10 - 2Q = 2$
 - $Q = 4$ units
- Optimal price?
 - $P = 10 - (4) = \$6$
- Maximum profits?
 - $PQ - C(Q) = (6)(4) - (6 + 8) = \10

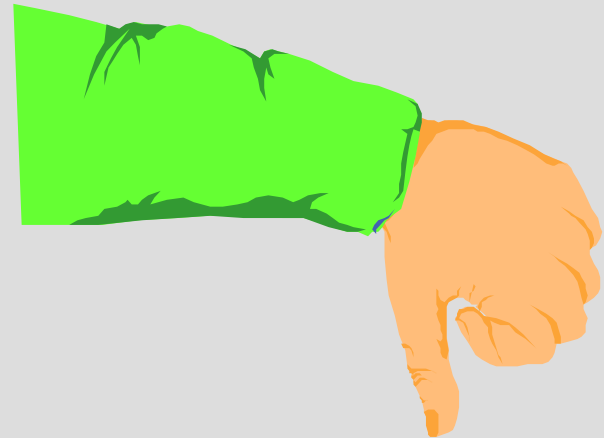
Long Run Adjustments?

- None, unless the source of monopoly power is eliminated.

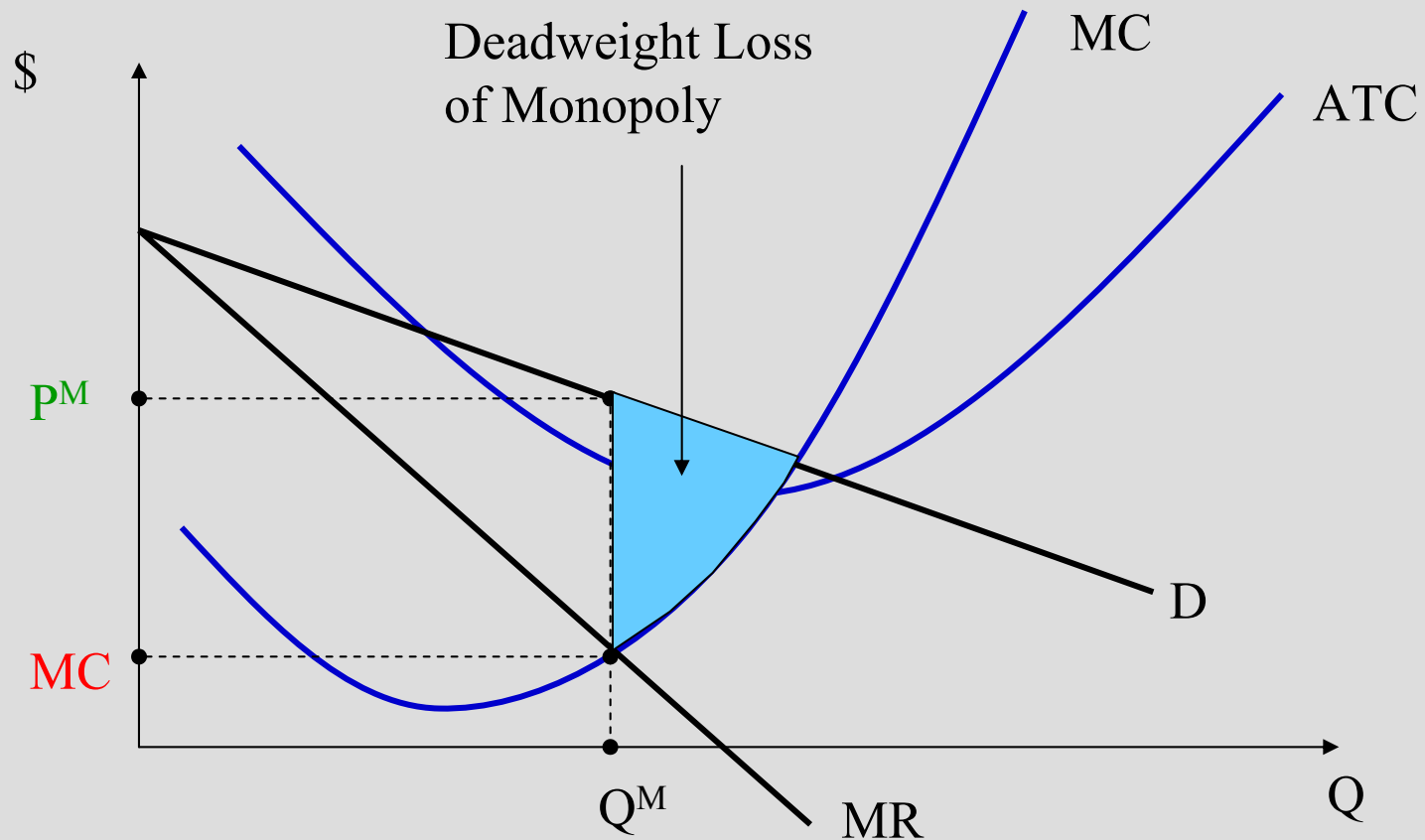


Why Government Dislikes Monopoly?

- $P > MC$
 - Too little output, at too high a price.
- Deadweight loss of monopoly.



Deadweight Loss of Monopoly



Arguments for Monopoly

- The beneficial effects of **economies of scale, economies of scope, and cost complementarities** on price and output may outweigh the negative effects of **market power**.
- Encourages innovation.

Monopoly Multi-Plant Decisions

- Consider a monopoly that produces identical output at two production facilities (think of a firm that generates and distributes electricity from two facilities).
 - Let $C_1(Q_1)$ be the production cost at facility 1.
 - Let $C_2(Q_2)$ be the production cost at facility 2.
- Decision Rule: Produce output where
$$MR(Q) = MC_1(Q_1) \text{ and } MR(Q) = MC_2(Q_2)$$
 - Set price equal to $P(Q)$, where $Q = Q_1 + Q_2$.

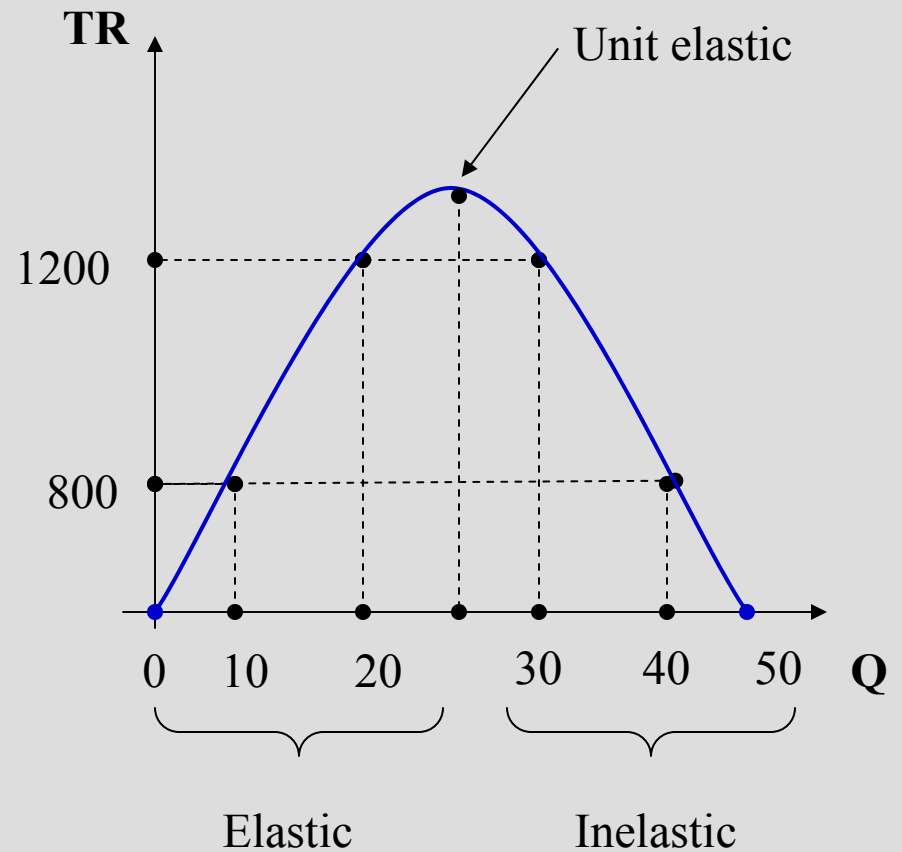
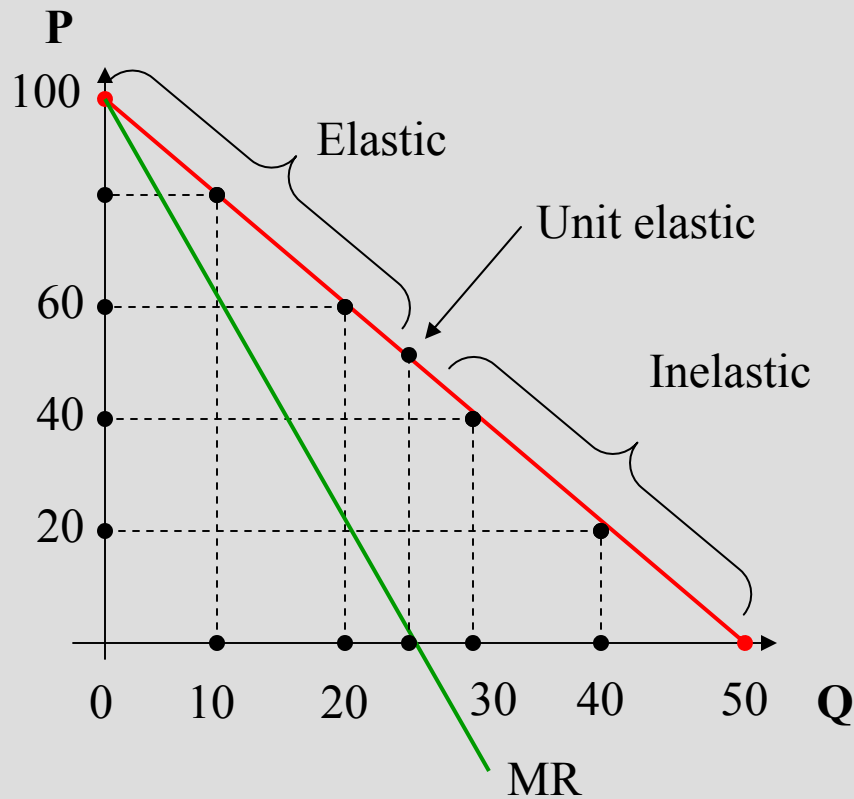
Monopolistic Competition: Environment and Implications

- Numerous buyers and sellers
- Differentiated products
 - **Implication:** Since products are differentiated, each firm faces a downward sloping demand curve.
 - Consumers view differentiated products as close substitutes: there exists *some* willingness to substitute.
- Free entry and exit
 - **Implication:** Firms will earn zero profits in the long run.

Managing a Monopolistically Competitive Firm

- Like a monopoly, monopolistically competitive firms
 - have market power that permits pricing above marginal cost.
 - level of sales depends on the price it sets.
- But ...
 - The presence of other brands in the market makes the demand for your brand more elastic than if you were a monopolist.
 - Free entry and exit impacts profitability.
- Therefore, monopolistically competitive firms have limited market power.

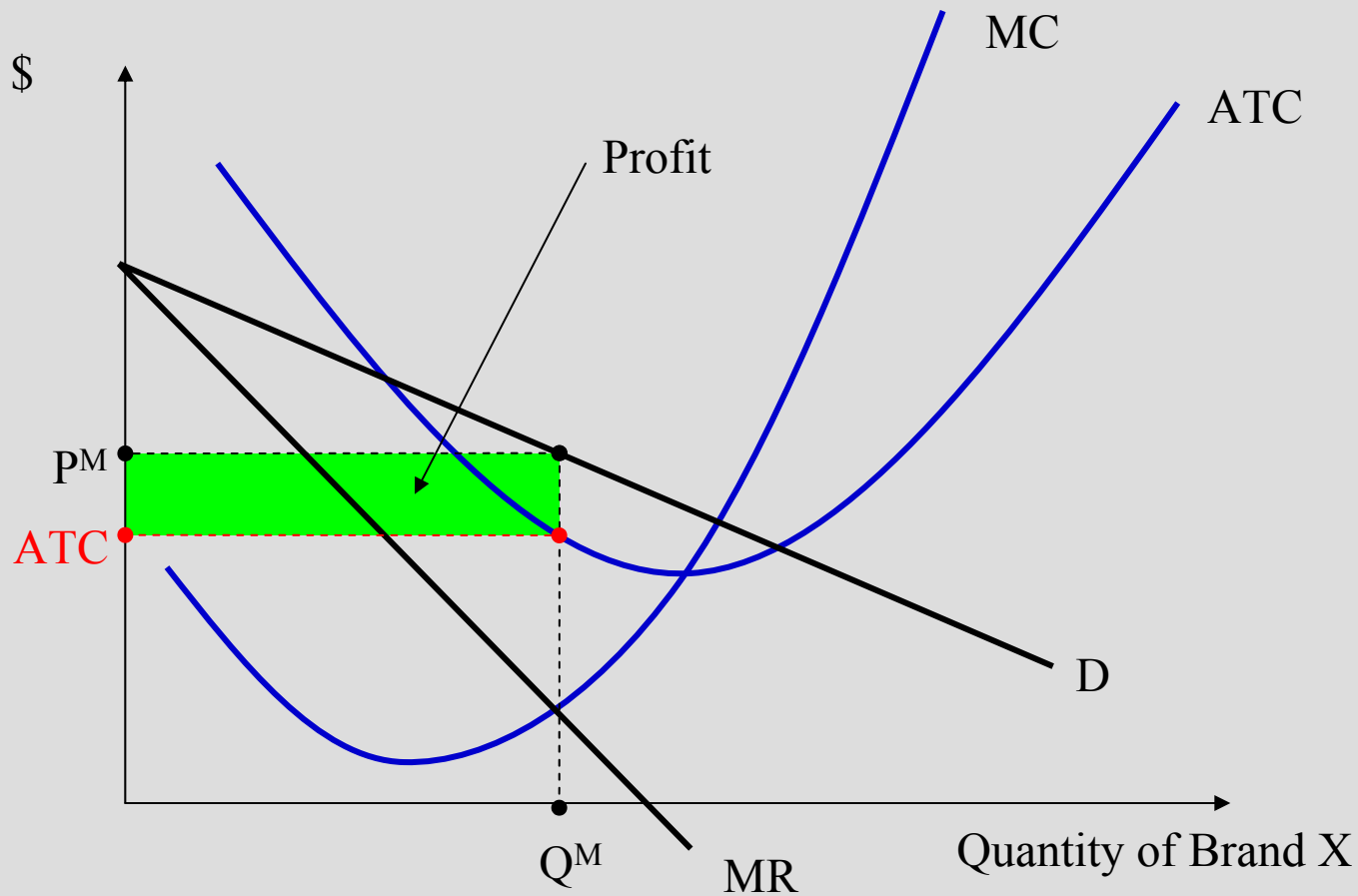
Marginal Revenue Like a Monopolist



Monopolistic Competition: Profit Maximization

- Maximize profits like a monopolist
 - Produce output where $MR = MC$.
 - Charge the price on the demand curve that corresponds to that quantity.

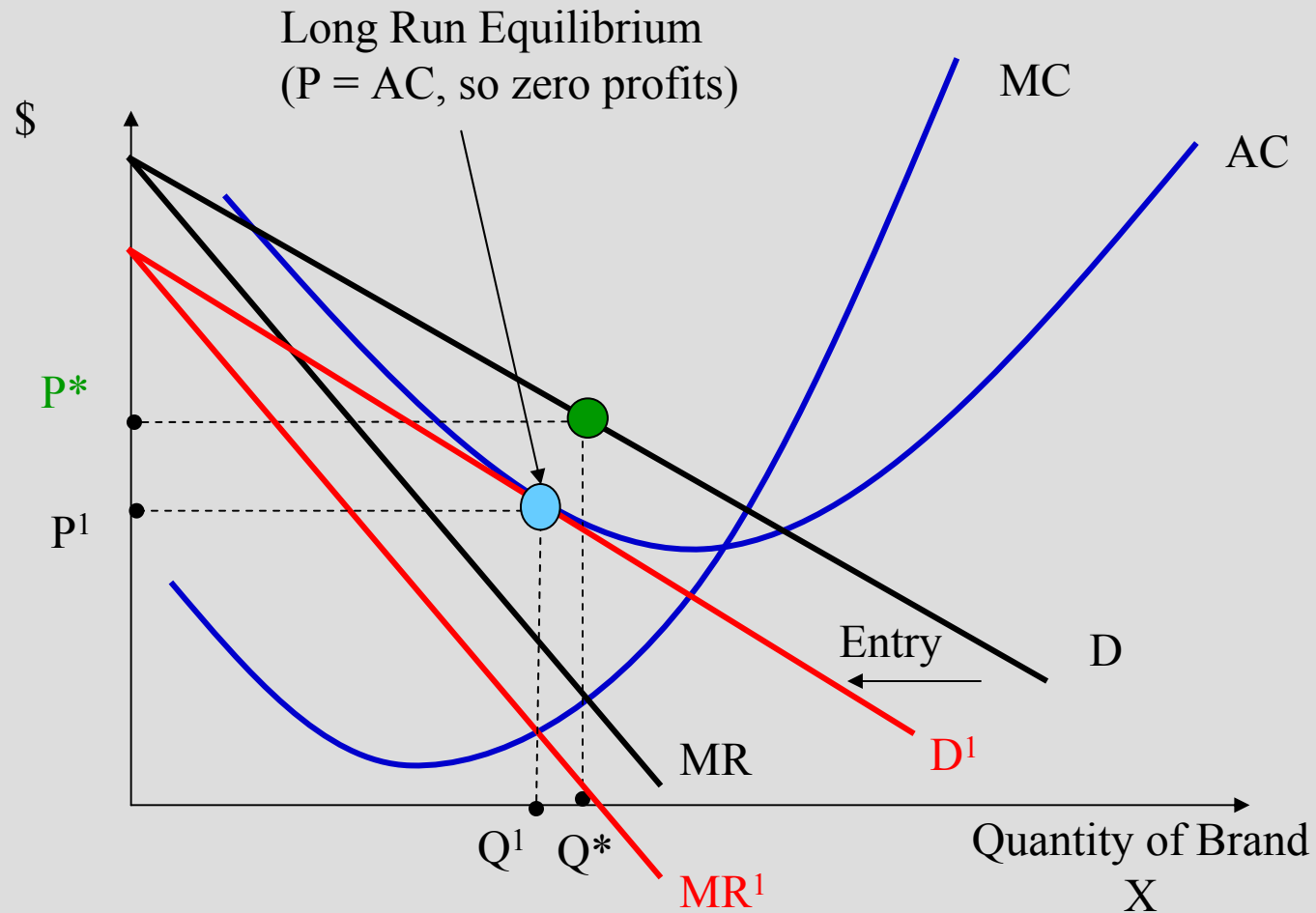
Short-Run Monopolistic Competition



Long Run Adjustments?

- If the industry is truly monopolistically competitive, there is free entry.
 - In this case other “greedy capitalists” enter, and their new brands steal market share.
 - This reduces the demand for your product until profits are ultimately zero.

Long-Run Monopolistic Competition



Monopolistic Competition

The Good (To Consumers)

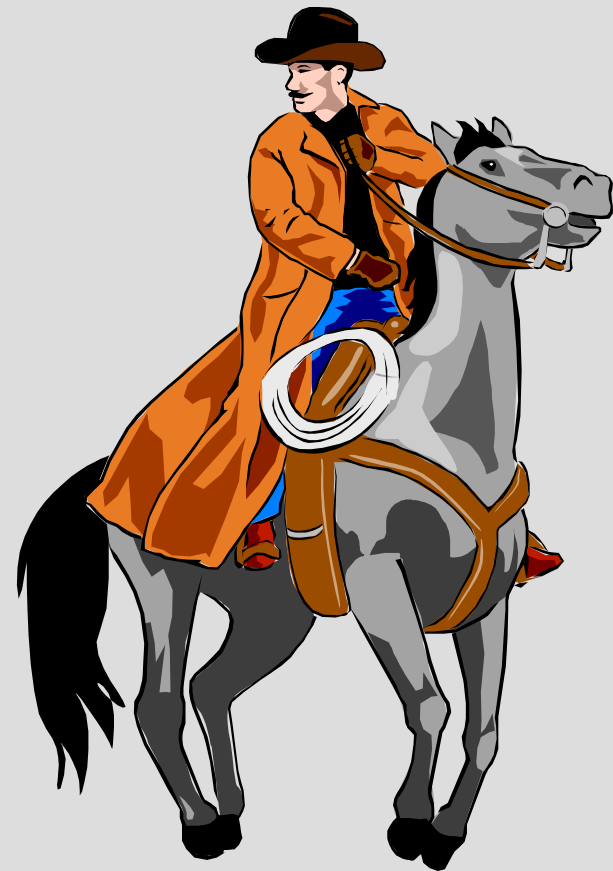
- Product Variety

The Bad (To Society)

- $P > MC$
- Excess capacity
 - Unexploited economies of scale

The Ugly (To Managers)

- $P = ATC > \text{minimum of average costs.}$
 - Zero Profits (in the long run)!



Optimal Advertising Decisions

- Advertising is one way for firms with market power to differentiate their products.
- But, how much should a firm spend on advertising?
 - Advertise to the point where the additional revenue generated from advertising equals the additional cost of advertising.
 - Equivalently, the profit-maximizing level of advertising occurs where the advertising-to-sales ratio equals the ratio of the advertising elasticity of demand to the own-price elasticity of demand.

$$\frac{A}{R} = \frac{E_{Q,A}}{-E_{Q,P}}$$

Maximizing Profits: A Synthesizing Example

- $C(Q) = 125 + 4Q^2$
- Determine the profit-maximizing output and price, and discuss its implications, if
 - You are a price taker and other firms charge \$40 per unit;
 - You are a monopolist and the inverse demand for your product is $P = 100 - Q$;
 - You are a monopolistically competitive firm and the inverse demand for your brand is $P = 100 - Q$.

Marginal Cost

- $C(Q) = 125 + 4Q^2$,
- So $MC = 8Q$.
- This is independent of market structure.

Price Taker

- $MR = P = \$40$.
- Set $MR = MC$.
 - $40 = 8Q$.
 - $Q = 5$ units.
- Cost of producing 5 units.
 - $C(Q) = 125 + 4Q^2 = 125 + 100 = \225 .
- Revenues:
 - $PQ = (40)(5) = \$200$.
- Maximum profits of $-\$25$.
- Implications: Expect exit in the long-run.

Monopoly/Monopolistic Competition

- $MR = 100 - 2Q$ (since $P = 100 - Q$).
- Set $MR = MC$, or $100 - 2Q = 8Q$.
 - Optimal output: $Q = 10$.
 - Optimal price: $P = 100 - (10) = \$90$.
 - Maximal profits:
 - $PQ - C(Q) = (90)(10) - (125 + 4(100)) = \375 .
- Implications
 - Monopolist will not face entry (unless patent or other entry barriers are eliminated).
 - Monopolistically competitive firm should expect other firms to clone, so profits will decline over time.

Conclusion

- Firms operating in a perfectly competitive market take the market price as given.
 - Produce output where $P = MC$.
 - Firms may earn profits or losses in the short run.
 - ... but, in the long run, entry or exit forces profits to zero.
- A monopoly firm, in contrast, can earn persistent profits provided that source of monopoly power is not eliminated.
- A monopolistically competitive firm can earn profits in the short run, but entry by competing brands will erode these profits over time.