Conduct: Integration and Merger Activity

- Vertical Integration
  - Where various stages in the production of a single product are carried out by one firm.
- Horizontal Integration
  - The merging of the production of similar products into a single firm.
- Conglomerate Mergers
  - The integration of different product lines into a single firm.

DOJ/FTC Horizontal Merger Guidelines

- Recall HHI = 10,000 Σ w_i^2, where $w_i = S_i / S_T$.
- A proposed horizontal merger may be challenged if either
  - HHI exceeds 1800, or would be after merger, and
  - Merger increases the HHI by more than 100.
- But revised guidelines recognize efficiencies:
  - "The primary benefit of mergers to the economy is their efficiency potential...which can result in lower prices to consumers...In the majority of cases the *Guidelines* will allow firms to achieve efficiencies through mergers without interference..."

Managerial Economics & Business Strategy
Chapter 8

Managing in Competitive, Monopolistic, and Monopolistically Competitive Markets

Modified by DF 10/12

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: Structure

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

What **really** counts: each buyer and seller has insignificant influence on price.

Key Implications

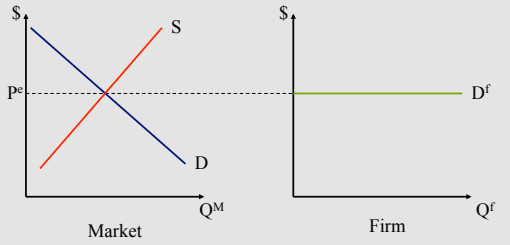
- Firms are "price takers" (P = MR).
- In the short-run, firms may earn profits or losses.
- Long-run economic profits are zero.

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)

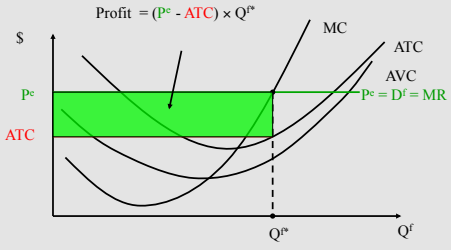
Setting Price



Profit-Maximizing Output Decision

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

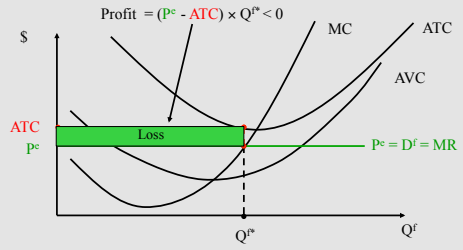
Graphically: Representative Firm's Output Decision



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

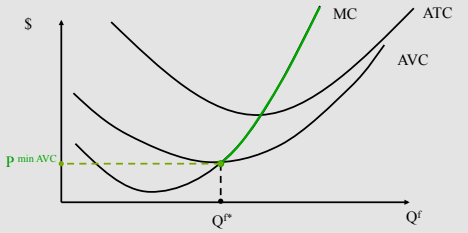
Should this Firm Sustain Short Run Losses or Shut Down?



Shutdown Decision Rule

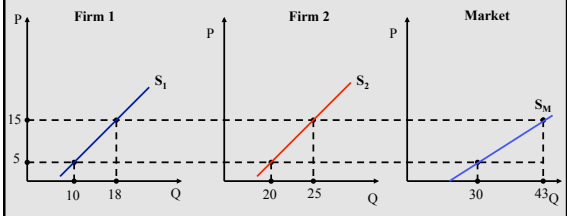
- A profit-maximizing firm should continue to operate (sustain short-run losses) if its *operating loss* is less than its *fixed costs*.
  - Operating results in a smaller loss than ceasing operations.
  - More carefully, if *OL* < *sunk FC*.
- Decision rule:
  - A firm should shutdown when P < min AVC.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

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



Short-Run Market Supply Curve

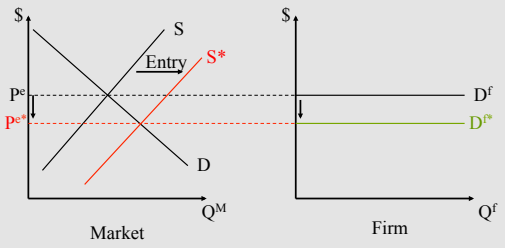
- The market supply curve is the summation of each individual firm's supply at each price.



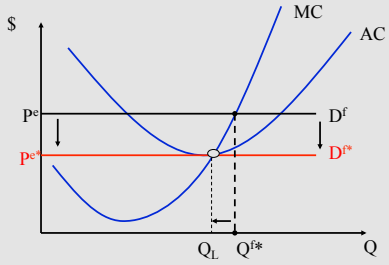
Long Run Adjustments?

- 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 market price, increases market quantity.
- Demand for individual firm's product shifts down.
- Firm reduces output to maximize profit.
- Similarly, if SR profits are negative: exit lowers supply, drives up price, …
- Long run profits are zero.

Features of Long Run Competitive Equilibrium

- P = MC
  - Socially efficient output, in SR as well as in LR.
- P = minimum AC
  - Efficient plant size.
  - Zero profits
    - Firms are earning just enough to offset their opportunity cost.

Summary: Managing a competitive firm

Conduct:

- Take prevailing price P as given
- Chose quantity to equate MC to P.
- Look for ways to lower cost

Performance:

- zero economic profit (PS=FC), but—if it's any consolation—maximal SV=PS+CS.

Comment: firms may also try to blunt competition and escape the "commodity" trap

Monopoly: Structure

- 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.
  - Of course, the price charged affects the quantity demanded of the monopolist's product.

"Natural" Sources of Monopoly Power

- Economies of scale
- Economies of scope
- Learning curve

"Created" Sources of Monopoly Power

- Patents and other legal barriers (like licenses)
- Lock-in effects, e.g., networks
- Tying contracts
- Exclusive contracts
- Collusion

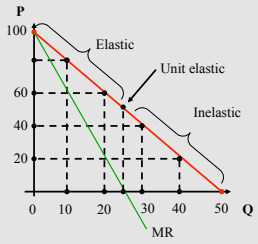
Legal Ostacles to Monopoly Power

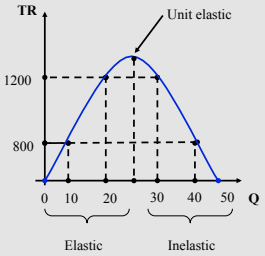
- Section 3 of the Clayton Act (1914)
  - Prohibits exclusive dealing and tying arrangements where the effect may be to "substantially lessen competition"
- Sections 1 and 2 of the Sherman Act (1890)
  - Prohibits price-fixing, market sharing, and other collusive practices designed to "monopolize, or attempt to monopolize" a market

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!

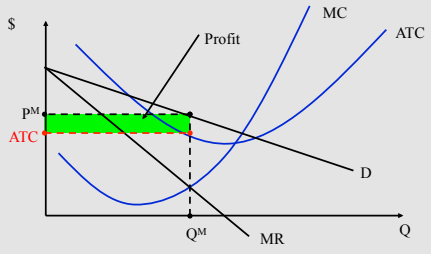
A Monopolist's Marginal Revenue





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? $P = a + bQ$

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

- More generally, MR is the derivative of R=QP(Q)
- In terms of own-price elasticity E,

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

$$\frac{dR}{dQ} = \frac{d(QP)}{dQ} = P + Q\frac{dP}{dQ} = P[1 + \frac{Q}{P}\frac{dP}{dQ}]$$

$$= P[1 + \frac{1}{\varepsilon}]$$

because (own price) elasticity (of demand) is

$$\varepsilon = \frac{dQ}{dP}\frac{P}{Q}$$

A Linear 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

How Elasticity Determines Markup and Price

- In previous example, P = 3.0 MC…why 3?

Optimal Markup

- MC = MR = P[1+1/ε] so
- Monopolist's profit maximizing markup is
- P = m MC, where the gross markup factor is

$$m = \frac{1}{1 + \frac{1}{\varepsilon}} = \frac{\varepsilon}{\varepsilon + 1}$$

Example

- MC = \$10 and ε = -3. Then
- m = -3/(-3+1) = 3/2 = 1.5, and
- P = m MC = (1.5)\$10 = \$15.
- So the monopolist maximizes profits by charging 150% of MC when elasticity is -3.

Monopoly Multi-Plant Decisions

- Consider a monopoly that produces identical output at two production facilities. Eg., PG&E at Moss Landing and over the hill.
  - Let $C_1(Q_2)$ be the production cost at facility 1.
  - Let $C_2(Q_2)$ be the production cost at facility 2.
- Decision Rule: Produce output where

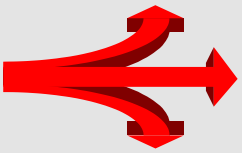
  $MR(Q) = MC_1(Q_1)$ and $MR(Q) = MC_2(Q_2)$
  - Set price equal to $P(Q)$, where $Q = Q_1 + Q_2$.

The math

- $Q = Q_1 + Q_2$ is total output, so total cost is
- $C(Q) = C_1(Q_1) + C_2(Q_2)$ and
- Profit is $\pi = R(Q_1 + Q_2) - C_1(Q_1) + C_2(Q_2)$
- The first order conditions are
  - $0 = \partial\pi/\partial Q_1 = MR(Q_1 + Q_2) - MC_1(Q_1)$, and
  - $0 = \partial\pi/\partial Q_2 = MR(Q_1 + Q_2) - MC_2(Q_2)$, so…
- Cookbook: solve simultaneous equations
  - $MR(Q_1 + Q_2) = MC_1(Q_1)$
  - $MR(Q_1 + Q_2) = MC_2(Q_2)$
  - check whether more profitable to shut down a plant

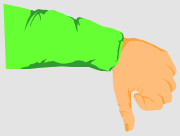
Long Run Adjustments?

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

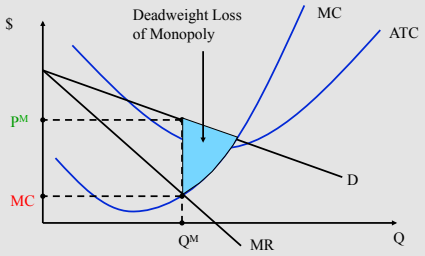


Why Government Dislikes Monopoly?

- P > MC
  - Too little output, at too high a price.
- Deadweight loss of monopoly.
- Another problem is that monopolies tend to stifle innovation.
  - More on that in a few weeks.



Deadweight Loss of Monopoly



On the other hand…

- 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.
- The prospect of acquiring monopoly power encourages innovation.
- The industry might not be viable otherwise.
- Regulation might reduce DW loss but create worse problems…

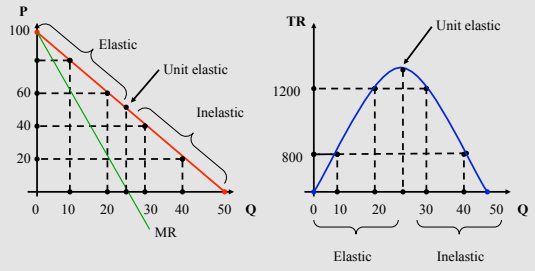
Monopolistic Competition: Structure and Conduct

- Numerous buyers and sellers
- Differentiated products
  - **Implication:** Since products differ, each firm faces a downward sloping demand curve.
  - Consumers view the products as fairly close substitutes.
- 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.

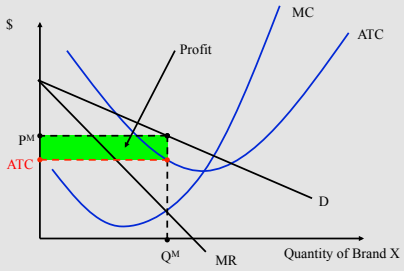
Marginal Revenue Like a Monopolist



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.

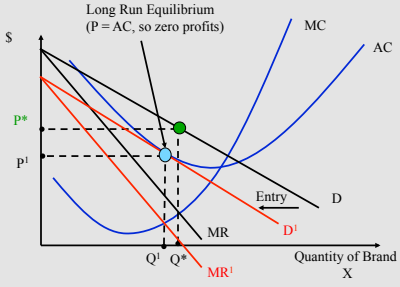
Short-Run Monopolistic Competition



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 > 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 marginal revenue generated from advertising equals the marginal 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. This is the Dorfman-Steiner condition:

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

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.