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

Market

Firm

$\rightarrow$ $\rightarrow$

$D$ $S$

$P_e$

$Q^M$ $Q^F$

$D^f$
Profit-Maximizing Output Decision

- $\text{MR} = \text{MC}$.
- Since, $\text{MR} = P$,
- Set $P = \text{MC}$ to maximize profits.
Graphically: Representative Firm’s Output Decision

Profit = \( (P^e - ATC) \times Q^f* \)
A Numerical Example

• Given
  ■ P=$10
  ■ C(Q) = 5 + Q²

• 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?

Profit = (Pe - ATC) × Qf* < 0

$\text{ATC}$

$\text{MC}$

$\text{AVC}$

$\text{Pe}$

$\text{Qf}^*$

$\text{Qf}$

$\text{P}^e = \text{Df} = \text{MR}$

Loss
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 ≥ min AVC.
Firm’s Short-Run Supply Curve: MC Above Min AVC

- $Q^f$ (quantity)
- $P_{\text{min AVC}}$
- $MC$
- $AVC$
- $ATC$

The diagram illustrates the short-run supply curve for a firm, where the marginal cost (MC) is above the minimum average variable cost (Min AVC). This condition indicates that the firm will produce a level of output ($Q^f$) at which the marginal cost equals the price ($P_{\text{min AVC}}$), ensuring the firm covers all variable costs and contributes to fixed costs.
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?

Market

Firm

$\begin{align*}
\text{Market:} \\
\quad S & \quad \downarrow \quad D \\
\quad Q^M & \quad \downarrow \quad Q^f \\
\quad P_e & \quad \downarrow \quad P_e^* \\
\quad \text{Entry} & \quad \downarrow \quad S^* \\
\end{align*}$

$\begin{align*}
\text{Firm:} \\
\quad D^f & \quad \downarrow \quad D^{f*} \\
\quad Q^f & \\
\end{align*}$
Effect of Entry on the Firm’s Output and Profits?

$Q_{AC}\ AC\ MC\ Pe\ Df\ Pe^*\ Df^*\ Q_L\ Q_f^*$
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 = 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)
• 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

Inelastic

Elastic

Unit elastic

MR

P

Q

TR

0 10 20 30 40 50

0 10 20 30 40 50

100 60 40 20

1200 800
Monopoly Profit Maximization

Produce where $\text{MR} = \text{MC}$.
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

Deadweight Loss of Monopoly

$\text{Q}^M$

$\text{P}^M$

$\text{MC}$

$\text{MR}$

$\text{D}$

$\text{MC}$

$\text{ATC}$

$\text{Q}$
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.
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

The diagram shows the relationship between price (P) and quantity (Q) for different levels of price elasticity. The graph on the left illustrates the marginal revenue (MR) curve, with points labeled as elastic, unit elastic, and inelastic. The graph on the right shows the total revenue (TR) curve, with points labeled as elastic and inelastic.
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

Profit

$P^M$

$P^m$

$Q^M$

$MC$

$ATC$

$D$

$MR$

Quantity of Brand X

Profit

$ATC$

$MC$

$MR$

$Q^M$

$P^M$

$P^m$

$ATC$

$D$

$MR$

Quantity of Brand X
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

Long Run Equilibrium
(P = AC, so zero profits)
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 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.