<table>
<thead>
<tr>
<th>Excludable</th>
<th>Rival</th>
<th>Non-excludable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Good:</td>
<td>Private markets should and will provide.</td>
<td></td>
</tr>
<tr>
<td>Common Resource:</td>
<td>Private markets will not provide.</td>
<td></td>
</tr>
<tr>
<td>Natural Monopoly:</td>
<td>Private markets will provide too little.</td>
<td></td>
</tr>
<tr>
<td>Public Good:</td>
<td>Private markets should not and will not provide.</td>
<td></td>
</tr>
</tbody>
</table>
The role of government in a market economy

- Provision of an institutional framework:
  - Physical infrastructure
  - Institutional infrastructure
  
  To the extent that these are public goods, and therefore may be under-supplied by private markets, we often rely on the public sector to provide them.

- Addressing normative issues

- Dealing with market failure:
  - Defining market failure
  - Types of market failure
  
  To the extent that there exists a true market failure, we often rely on the public sector to provide corrective measures.
Factors Affecting a Firm’s Cost Behavior

- Diminishing Returns
- Economies of Scale
- Economies of Scope

Cost Function

\( C(q) \)

- Fixed Costs
- Variable Costs

Factor Costs

- Purchasing Power
- Market Power of suppliers

but only

- Economic Costs
  Not Accounting Costs!
Thinking About a Firm’s Profit Function: $\pi(q) = R(q) - C(q)$

- Revenue, $R(q) = 50q$
- Cost, $C(q) = 14,000 + 16q$
- Profit, $\pi(q) = -14,000 + 34q$

Break-even point: $q = 412$
Thinking About a Firm’s Profit Function: \( \pi(q) = R(q) - C(q) \)

\[ R(q) = 50q - 0.01q^2 \]

\[ C(q) = 14,000 + 16q \]

\[ \pi(q) = -14,000 + 34q - 0.01q^2 \]
Thinking About a Firm’s Profit Function: $\pi(q) = R(q) - C(q)$

Revenue, $R(q) = 50q - 0.01q^2$

Cost, $C(q) = 14,000 + 16q + 0.01q^2$

Profit, $\pi(q) = -14,000 + 34q - 0.02q^2$
Thinking About a Firm’s Profit Function: $\pi(q) = R(q) - C(q)$

- Revenue, $R(q) = 50q - 0.01q^2$
- Cost, $C(q) = 14,000 + 16q - 0.01q^2 + 0.0001q^3$
- Profit, $\pi(q) = -14,000 + 34q - 0.0001q^3$
Costs Curves and Their Shapes

A complicated version of the story . . .

\[ TC = C(q) = a + bq - cq^2 + dq^3 \]

A simpler version of the story . . .

\[ TC = C(q) = a + bq + cq^2 \]

Mankiw, Chapter 12, Figure 5

Mankiw, Chapter 12, Figure 4
Returning to the Issue of Profit Maximization . . .

\[ \pi(q) = R(q) - C(q) \]
\[ \frac{d\pi(q)}{dq} = \frac{dR(q)}{dq} - \frac{dC(q)}{dq} \]

\[ \frac{d\pi(q)}{dq} = MR - MC \]
\[ MR = MC \]

For a price taker, marginal revenue (MR) is constant . . .

The profit-maximizing, “optimal” output level
Returning to the Issue of Profit Maximization . . .

\[ \pi(q) = R(q) - C(q) \]
\[ \frac{d\pi(q)}{dq} = \frac{dR(q)}{dq} - \frac{dC(q)}{dq} \]

\[ \frac{d\pi(q)}{dq} = MR - MC \]
\[ MR = MC \]

For a price maker, marginal revenue (MR) is declining as a function of q . . .
Equilibrium in a Competitive Market

- The market determines the price that the price taker takes . . .
- The cost function determines whether the firm makes a profit or incurs a loss . . .
- Profits attract new competition (free entry condition).
- Zero profit is “normal” profit.

**The Market . . .**

**The Firm . . .**

The market determines the price that the price taker takes. The cost function determines whether the firm makes a profit or incurs a loss. Profits attract new competition (free entry condition). Zero profit is “normal” profit.
Short-Run Firm Supply Functions and Supply Curves

- **Operate at a profit**
- **Continue operations at a loss**
- **Shut down**

- **Break even**

![Graph showing supply functions and curves with MC, ATC, AVC, MR = AR = d, q, and q* points.](image)
Short-Run Firm Supply Functions and Supply Curves

Industry Supply

\[ Q_s = \sum_{i} q_{si} \], where \( q_{si} = \phi(p, w) \)

Firm Supply

\[ Q_s = \sum_{i} q_{si} \], where \( q_{si} = \phi(p, w) \)

costs (of inputs)

prices (of output)

Technology of production and industry structure

Conditions of industry supply

Firm 1

\[ P \]

\[ q_1 \]

\[ MC_1 \]

Firm 2

\[ P \]

\[ q_2 \]

\[ MC_2 \]

Firm 3

\[ P \]

\[ q_3 \]

\[ MC_3 \]

Industry

\[ P \]

\[ S \]

\[ Q \]

\[ Q_s + Q_s + Q_s = Q \]
Long-Run Industry Supply

*Constant Cost Industry*: Horizontal long-run industry supply
**Long-Run Industry Supply**

*Increasing Cost Industry:* Long-run industry supply slopes upward.
**Long-Run Industry Supply**

*Decreasing Cost Industry*: Long-run industry supply slopes downward
Monopoly and “Market Power”

**Monopoly**  A firm that is the sole seller of a product without close substitutes.

**Market power**

**Rent seeking**

**Collusion**
Sources of Monopoly and “Market Power”

Barriers to Entry

- Control of a key resource
- Government policy
- “Natural” monopoly
  - Extreme Economies of Scale

![Graph showing decreasing ATC as quantity of output increases]
Equilibrium in a Monopolized Market

- Even for a monopolist, the demand curve still determines price.
- The cost function determines the amount of profit that the monopolist makes.
- Barriers to entry preserve positive ("abnormal") profits.
- Dead weight loss summarizes the inefficiency of monopolization.

For a price maker, marginal revenue (MR) is declining as a function of $q$. . .
The “standard” case against monopoly

- Monopolies restrict output and thus cause prices to rise above competitive levels.

- Monopolies generate social welfare losses

- Monopolies are likely to engage in “anti-competitive” practices to sustain their advantage (“Rent seeking”).
Social Responses to Monopoly Power

- Anti-trust laws
- Regulation
- Public Ownership (Nationalization)
- Do Nothing
## Taxonomy of Market Structures

### Imperfect Competition

<table>
<thead>
<tr>
<th>Number of Firms</th>
<th>Type of Product</th>
<th>Conditions of Entry</th>
<th>Price Makers</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>Unique (no substitutes)</td>
<td>Significant barriers to entry</td>
<td>Price Makers</td>
</tr>
<tr>
<td>Few</td>
<td>Unique or Differentiated</td>
<td>Significant barriers to entry</td>
<td>Price Takers</td>
</tr>
<tr>
<td>Many</td>
<td>Differentiated</td>
<td>Insignificant barriers to entry</td>
<td>Price Takers</td>
</tr>
<tr>
<td>Many</td>
<td>Homogenous (undifferentiated)</td>
<td>Free entry (and exit)</td>
<td>Price Takers</td>
</tr>
</tbody>
</table>
Some Tentative Conclusions (About Market Structure)

- Allocative efficiency
- Productive efficiency
- Economic profits