Microeconomics

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Market Structure: Monopoly

Introduction

- **Monopoly** is a market structure in which a single seller of a product with no close substitutes serves the entire market.
- The key feature that differentiates the monopoly from the competitive firm is the price elasticity of demand facing the firm.
  - In perfect competition the price elasticity of demand faced by the firm is infinite: a slight rise causes loss of all sales.
  - A monopoly has significant control over the market price.
- In practice it is usually difficult to identify and define a monopoly (DuPont example):
  - Competition authorities usually use Hehrfindal Index of Market Concentration and cross–price elasticity of demand to measure market power.

Sources of Monopoly I

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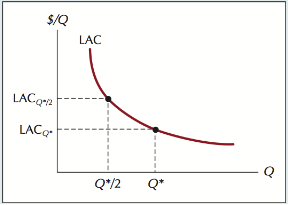
2. **Economies of Scale**

Figure: Natural Monopoly



Sources of Monopoly II

3. **Patents**
   - Most countries protect inventions through some sort of patent system. A patent typically confers the right to exclusive benefit from all exchanges involving the invention to which it applies.
   - Cost: Creation of a monopoly leads to inefficiency.
   - Benefit: Gives incentive to innovate.

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4. **Network Economies**
   - In many markets, a product becomes more valuable as greater numbers of consumers use it.
   - Example: Peer–to–peer downloading, Windows and many more.
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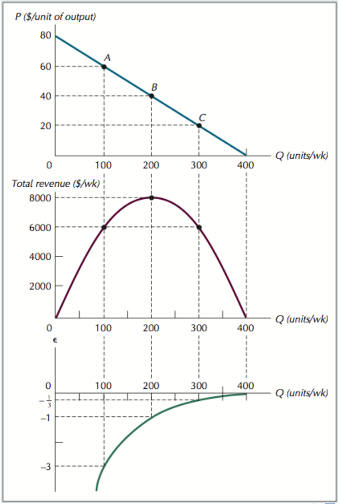
5 **Government Licenses**
- Example: 3G auctions, licenses to restaurants in airports.

Profit Maximization of a Monopoly I

The Monopolist's Total Revenue Curve



Profit Maximization of a Monopoly II

Optimality Condition

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- Total revenue:

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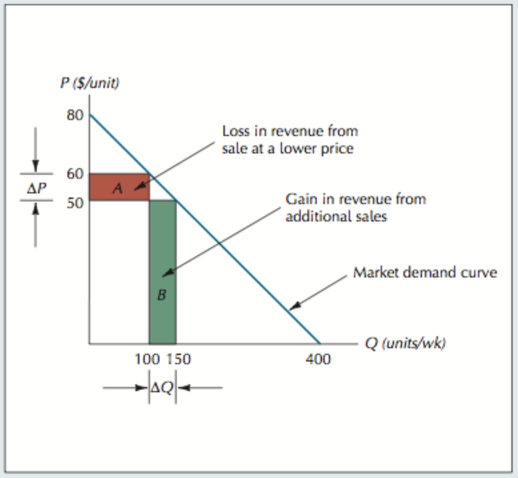
- Marginal revenue:

$$MR = \frac{\partial TR}{\partial Q} = \frac{\partial (P(Q) \cdot Q)}{\partial Q} =$$

$$P + Q \frac{\partial P(Q)}{\partial Q} = P \left(1 + \frac{Q}{P} \frac{\partial P}{\partial Q}\right) = P \left(1 + \frac{1}{\varepsilon}\right)$$

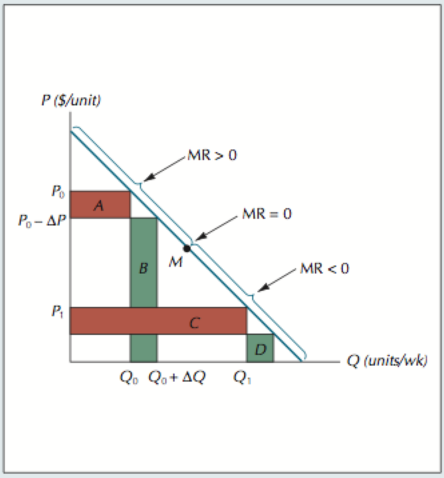
Profit Maximization of a Monopoly III

Changes in TR resulting from a price cut:



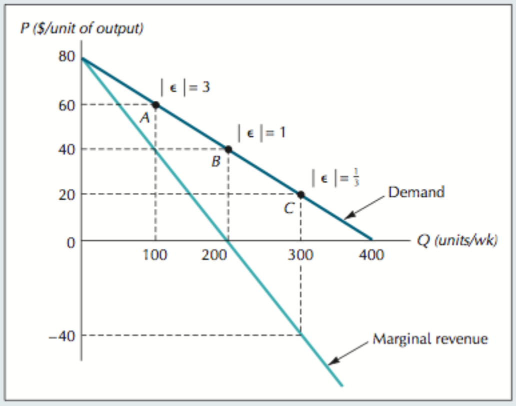
Profit Maximization of a Monopoly IV

Marginal Revenue and position on the Demand Curve:



Profit Maximization of a Monopoly V

Marginal Revenue and Elasticity of Demand:



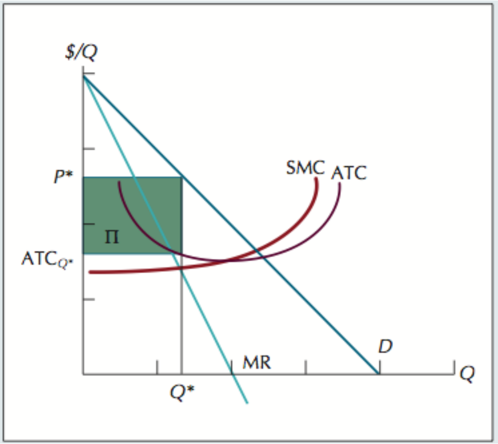
- At which point is the profit maximized?

Profit Maximization of a Monopoly VI

- Marginal Revenue with Linear Demand:
  - Demand:
$$P = a - bQ$$
  - Total Revenue:
$$TR = P(Q) \cdot Q = (a - bQ) \cdot Q = aQ - bQ^2$$
  - Marginal Revenue:
$$MR = \frac{\partial TR}{\partial Q} = a - 2bQ$$

Profit Maximization of a Monopoly VII

A Profit–Maximizing Output Graphically:



The Profit–Maximizing Mark–Up

- Recall the optimality condition:

$$MR = MC$$

- Recall the relationship between the price and the marginal revenue:

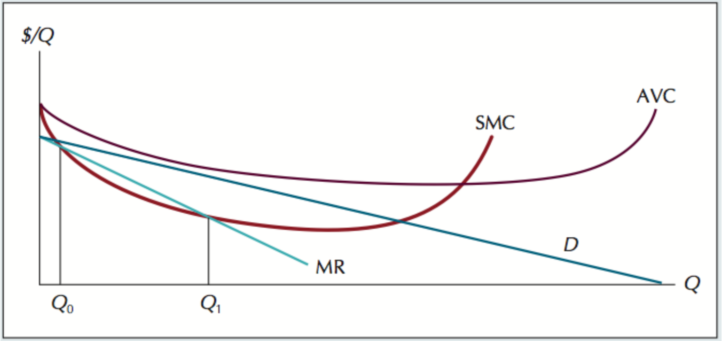
$$MR = P\left(1 + \frac{1}{\varepsilon}\right) = P\left(1 - \frac{1}{|\varepsilon|}\right)$$

- Combining the two yields **the mark–up** over the cost:

$$\frac{P - MC}{P} = \frac{1}{|\varepsilon|}$$

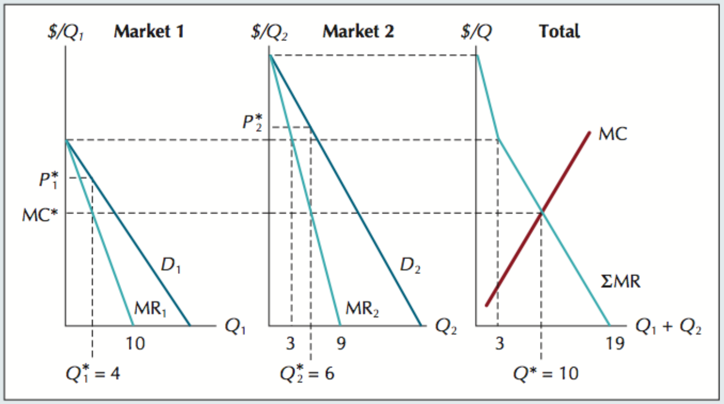
- E.g. if the price elasticity of demand facing a monopolist were equal to -2, the profit-maximizing markup would be 1, which implies that the profit-maximizing price is twice marginal cost.

The Monopolist's Shut–Down Condition



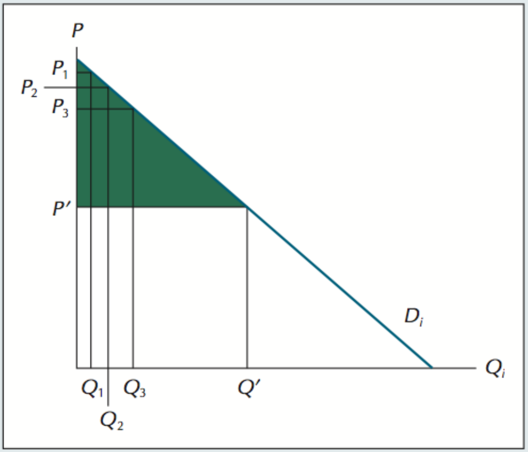
Price Discrimination I

Sales in Two Different Markets



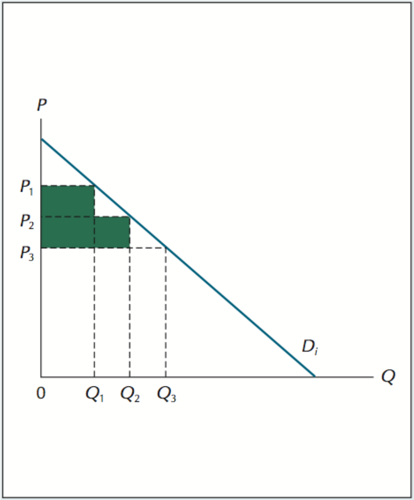
Price Discrimination II

First–Degree (Perfect) Price Discrimination

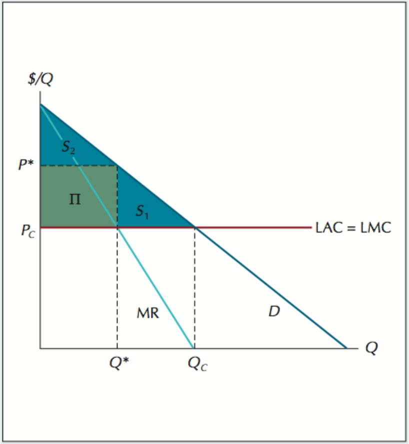


Price Discrimination III

Second–Degree Price Discrimination



Welfare–Loss from Single Price Monopoly



Public Policy Toward Natural Monopoly I

1. **State Ownership and Management**
   - Efficiency requires that price be equal to marginal cost.
   - For natural monopoly, marginal cost is below average total cost.
   - An option for getting around this is to have the state take over the industry.
   - Virtue: Government is not bound, the way a private firm is, to earn at least a normal profit.
   - Vice: Weak incentives for cost-conscious, efficient management.

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2. **State Regulation of Private Monopolies**
   - Leave ownership in private hands, while providing guide- lines or regulations that limit pricing discretion.
   - For instance: Private companies that provide electricity, water, and telephone service.
   - Leads to over–investment in capital and cross–subsidizing.

Public Policy Toward Natural Monopoly II

3 **Exclusive Contracting for Natural Monopoly**

- Though cost conditions may dictate that a market be served by a single supplier...
- ...there can still be competition to see who gets to be that supplier.
- Call for private companies to submit bids to supply the service. And the lowest bidder would then get the contract.
- Vices: May lead to corruption, requires extremely detailed contracts that are indistinguishable from direct control.

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4. **Enforcement of Anti–Trust Laws**
   - Rules that prohibit mergers between competing companies whose combined market share would exceed some predetermined fraction of total industry output.
   - Should be applied to prevent only those mergers where significant cost savings would not be realized.
   - Again a problem of defining markets and market shares.

Public Policy Toward Natural Monopoly III

5. **Do Nothing – Laissez–Faire Policy**
    - Obvious fairness and efficiency problems.
    - Allow price discrimination for efficiency purposes.
    - Fairness: where do the profits actually go? They usually are redistributed in taxes!