

AAE101: Intro to Ag. & Applied Econ.

Discussion Section 9

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Today's goal

To review how markets look in a pure monopoly environment.

Pure Monopoly

A pure monopoly exists when a single firm is the sole producer. These are the main characteristics of a pure monopoly:

1. Single seller.
2. No close substitutes for a product.
3. Price maker: the firm has control over the price because there are no competitors.
4. Strong barriers to entry (blocked entry).
5. Nonprice competition.

Examples of **pure monopolies**: Madison Gas and Electric, Green Bay Packers.

Examples of **near monopolies**: Intel (microprocessors), an airline that provides the only commercial flights to a town.

*This handout is based on the corresponding handouts from previous years by Felipe Parra Escobar, Matt McKetty & Talita Silva. Modifications and additions in this version by Erick.

Barriers to entry: Factors preventing firms from entering an industry.

1. Economies of Scale: Long run average total costs declining with total output. Think of industries with large fixed costs, like energy production.
2. Legal Barriers to Entry: Patents and licenses. For example, TV or radio stations, cable companies.
3. Ownership or control of essential resources
4. Pricing and other strategic barriers.

In a monopoly, the market has the following characteristics:

1. Demand curve is downward sloping.
2. No supply curve.
3. Monopolist sets price in the elastic region of the demand curve.

Output and price determination:

1. The monopolist will produce where $MR \geq MC$ and stop where $MR < MC$.
2. In order to determine the profit-maximizing price, extend a vertical line upward from the output determined in the step 1 (when you determine where to produce) to the pure monopolist's demand curve.
3. Determine the pure monopolist's economic profit by using either of the two methods:
 - (a) $(P-ATC)*Q = \text{Profit}$
 - (b) $TR-TC = \text{Profit}$
4. MR does not equal price.

Costs in a monopoly are impacted by economies of scales, network effects, rent-seeking behaviors, technological advance.

Price discrimination: charging different buyers different prices. Different prices are not based on cost differences. In order to introduce price discrimination, a monopolist needs to have a segregated market and no resale. Some examples are business travel, movie theaters, golf courses.

There are monopolistic markets that we call **natural monopolies**. These are regulated and they set the socially optimal price, i.e. $P = MC$.

Practice Problems

1. **Profit Maximization:** Suppose you are the owner of a monopolistic firm that produces a unique product. The market demand for your product is given by the following equation:

$$P = 100 - 2Q$$

where P is the price and Q is the quantity sold. Your total cost function is:

$$TC = 20Q + 100$$

- (a) Find the quantity (Q) that maximizes your profit.
 - (b) Determine the price (P) at this quantity.
 - (c) Calculate the total profit at this quantity.
2. **Price Discrimination:** A monopolist can sell its product in two separate markets: Market A and Market B. The demand functions in each market are:

$$\text{Market A: } P_A = 80 - 2Q_A$$

$$\text{Market B: } P_B = 100 - Q_B$$

The monopolist's total cost function is:

$$TC = 10(Q_A + Q_B) + 100$$

- (a) Determine the quantity to produce in each market if the monopolist practices price discrimination and maximizes profit.
- (b) Find the price charged in each market.
- (c) Calculate the total profit.

3. Team Activity: Analyzing a Monopoly Market:

- (a) Form groups of 3-4 students.
- (b) You have 7 minutes to solve the following questions together. Discuss your answers with your teammates, and make sure everyone understands the steps.

You are part of the management team of a monopoly firm called **EcoPower**, which is the sole provider of a new type of renewable energy. The demand for your energy product is described by the following equation:

$$P = 150 - 3Q$$

Your total cost function is:

$$TC = 30Q + 200$$

(a) Find the Profit-Maximizing Quantity and Price:

- Calculate the Marginal Revenue (MR) and Marginal Cost (MC).
- Determine the quantity (Q) that maximizes profit.
- Find the corresponding price (P).

(b) Calculate the Profit:

- Determine the total revenue (TR), total cost (TC), and profit at the profit-maximizing quantity.

(c) Discuss:

- As a team, discuss and write down one factor that might prevent new firms from entering this market.
- How could EcoPower use price discrimination to increase its profits? List one example of how this could be implemented.