

Unit 2.3.3 Monopoly

Unit Overview

2.3.3 - Monopoly

- Assumptions of the model
- Sources of monopoly power/barriers to entry
- Natural monopoly
- Demand curve facing the monopolist
- Profit-maximizing level of output
- Advantages and disadvantages of monopoly in comparison with perfect competition
- Efficiency in monopoly
- Price discrimination
 - >>Definition
 - >>Reasons for price discrimination
 - >>Necessary conditions for the practice of price discrimination
 - >>Possible advantages to either the producer or the consumer

 [Blog posts: "Monopoly"](#)

 [Blog posts: "Price Discrimination"](#)

Monopoly

Introduction to Monopoly

Discussion Questions:

True or false: A monopolist will always earn economic profits.

False: *A monopolist's profits depend on the level of demand for its product. If demand falls, the monopolist's profits will fall and could disappear.*

True or false: A monopolists will always charge the highest possible price for its output.

False: *Just like a purely competitive firm, a monopolist will maximize its profits when it charges the price where its marginal revenue equals its marginal cost of production.*

Monopoly

Characteristics of Monopolistic markets

Characteristics:

Single seller: One firm produces all the output of a particular product

No close substitutes: Product is unique and if consumers want to buy it they must buy from the monopolist.

Price maker: Since the monopolist is the sole supplier of the product, it can change the price by changing output. The firm faces a downward sloping demand curve, so increasing output lowers the price, decreasing output increases the price. The firm will set a price that maximizes its profits.

Blocked entry: Entry to the market is totally blocked, meaning the firm has no immediate competitors. Barriers to entry may be economies of scale, legal, technological or another type.

Nonprice competition: Since it has no competitors a monopolist cannot compete on price. Therefore, to attract new consumers the firm must engage in non-price competition such as advertising and public relations campaigns to promote its product's attributes.

Examples of Monopolies?

Monopoly

Demand as seen by a Monopolist

Three assumptions:

- 1) Entry is totally blocked
- 2) The monopolist is unregulated by any government so can charge whatever price it wants.
- 3) The firm is a single price seller. It sells all units of output at the same price.

- A monopolist faces a downward sloping Demand curve. The firm D curve is the market D curve!
- A monopolist can sell additional output only by lowering its price (due to the law of demand).
- A monopolist must lower the price of all of its output, not just the marginal units, since it is a single-price seller.
- As a result, as output increases, the firm's marginal revenue falls faster than the price.

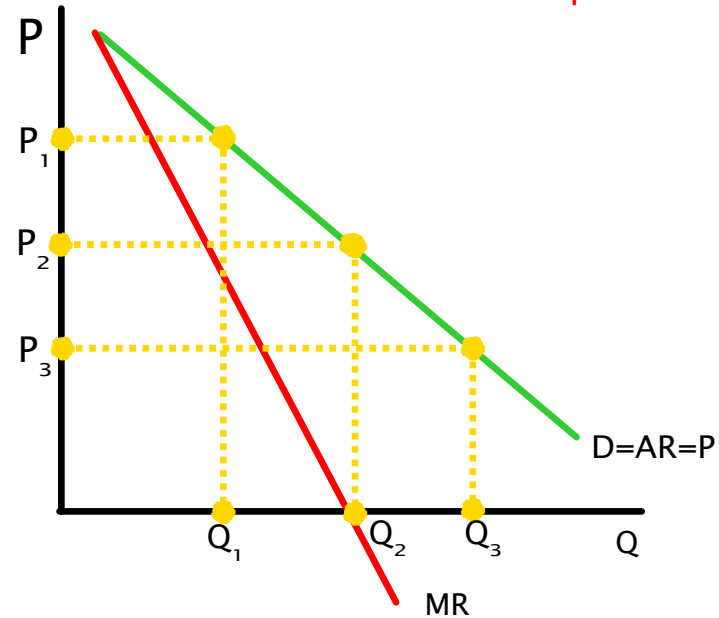
Monopoly

Demand as seen by a Monopolist

Demand and Marginal Revenue

Q	P	TR=P×Q	MR=ΔTR/ΔQ
0	172	0	
1	162	162	
P1 2	152	304	
3	142	426	
4	132	528	
5	122	610	
P2 6	112	672	
7	102	714	
8	92	736	
9	82	738	
P3 10	72	720	

Demand and MR for a Monopolist



Based on the above graph, over which range of output would a monopolist NEVER produce? Why?

What information is needed to determine the profit maximizing level of output for this monopolist?

Monopoly

Demand as seen by a Monopolist

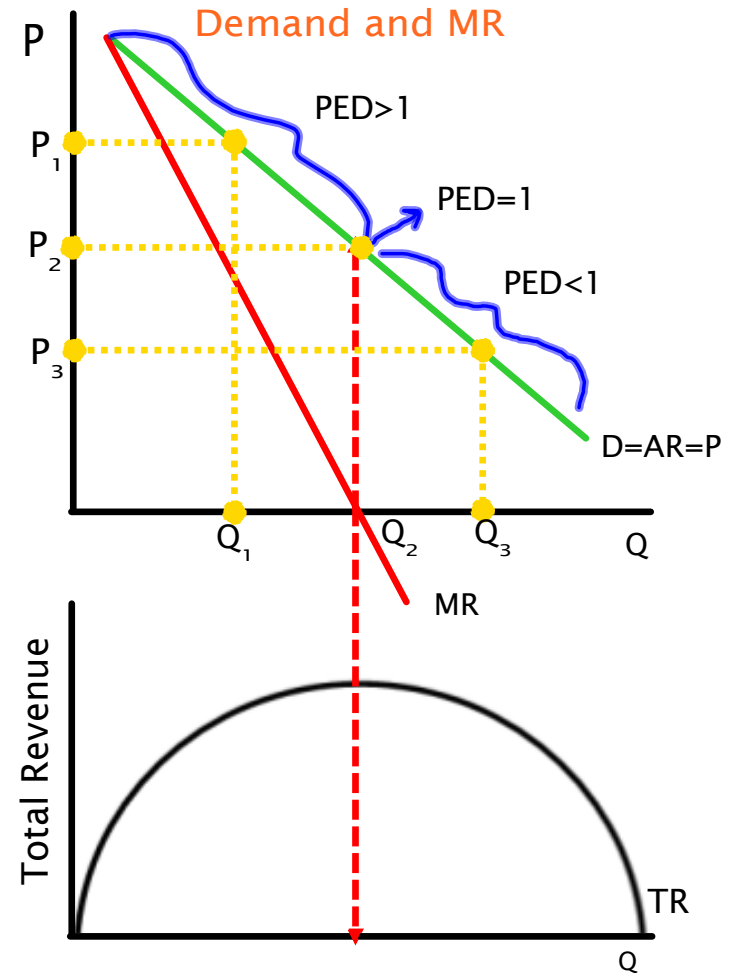
Elasticity and the monopoly Demand curve:

- Identify the elastic range of the demand curve.
- Identify the inelastic range of the demand curve.

Question: Why won't a monopolist ever produce at a level of output where it is in the inelastic range of its demand curve?

Answer: Because to achieve this level of output, its costs will increase while its revenues decrease, meaning its profits are shrinking.

- As long as demand is elastic, total revenue will rise when the monopoly increases output.
- Since total costs rise with output, profits will decline as demand becomes inelastic.
- Therefore, the monopolist will expand output only in the elastic portion of its demand curve.



Monopoly

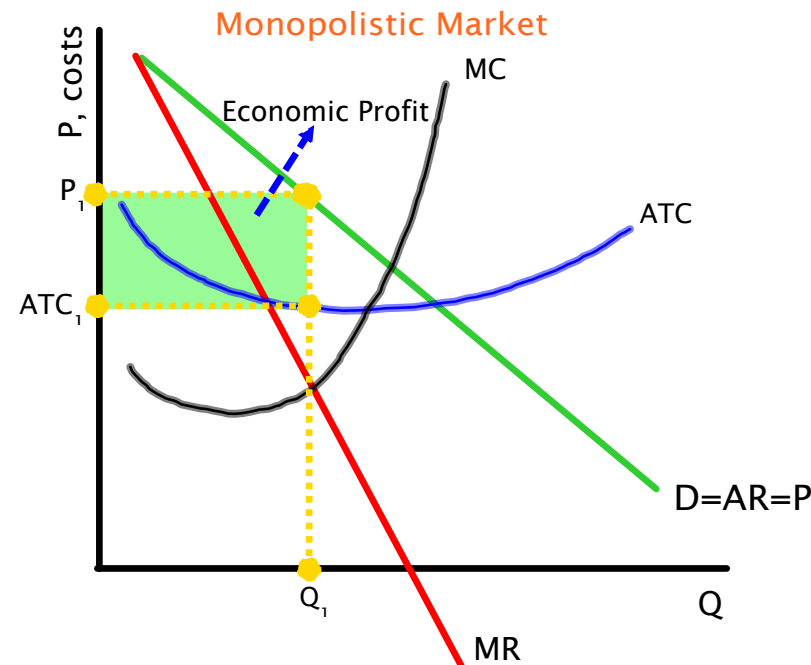
Profit maximization

MR = MC Rule for profit maximization: A monopolist will produce at the level of output where its marginal revenue equals its marginal cost for the same reason that a pure competitor will: because it cannot do any better than at this point.

- If the MR is ever greater than MC, the firm can increase its profits by producing more.
- If the MC of producing another unit is greater than the MR, the firm should produce less.
- Only when MR=MC is the firm achieving maximum profits!

Profits in the Monopoly diagram:

$$\text{Economic profit} = \text{TR} - \text{TC}, \text{ or...}$$
$$(\text{AR} - \text{ATC}) \times Q$$



This monopolist earns economic profits because at the profit-maximizing level of output, its average revenue is greater than its average total cost.

Monopoly

Profit maximization

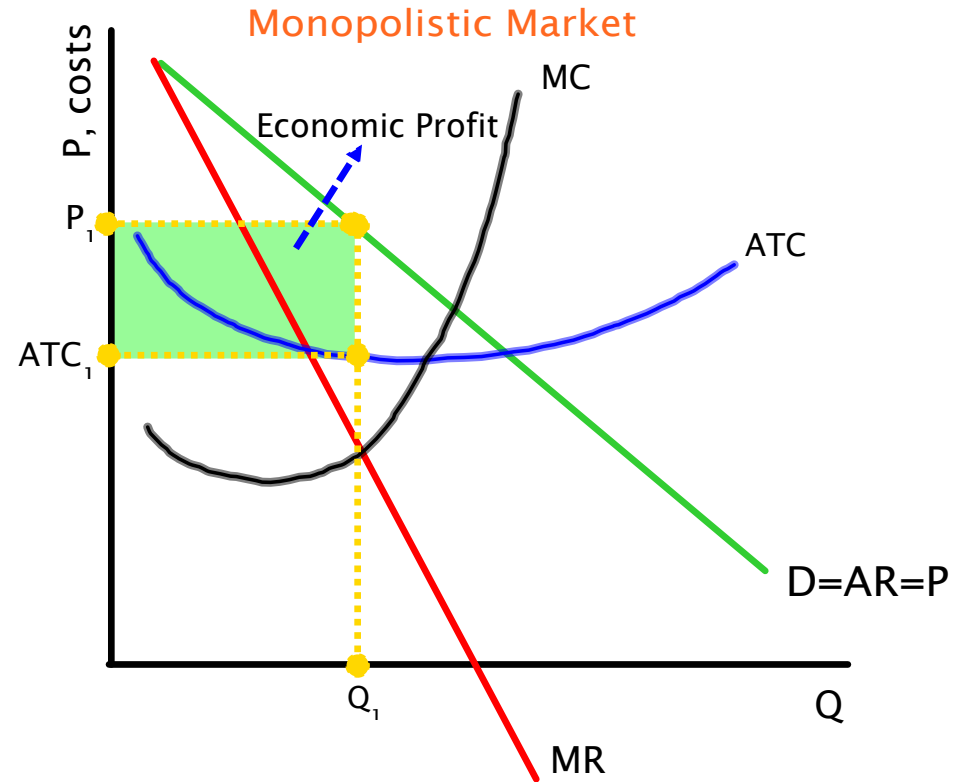
Discussion Question:

Can a monopolist earning short-run profits such as this one earn profits in the long-run as well?

Answer:

YES! In a purely competitive market short-run economic profits are eliminated by the entry of new profit-seeking firms.

However, in a monopolistic market, entry of new firms is blocked, therefore a monopolist can maintain economic profits, even in the long-run.



Question: *Is a monopolist guaranteed to earn economic profits in the long-run?*

Answer: *NO! If demand for its product decreases or the firm's costs increase, its profits can be eliminated.*

Monopoly

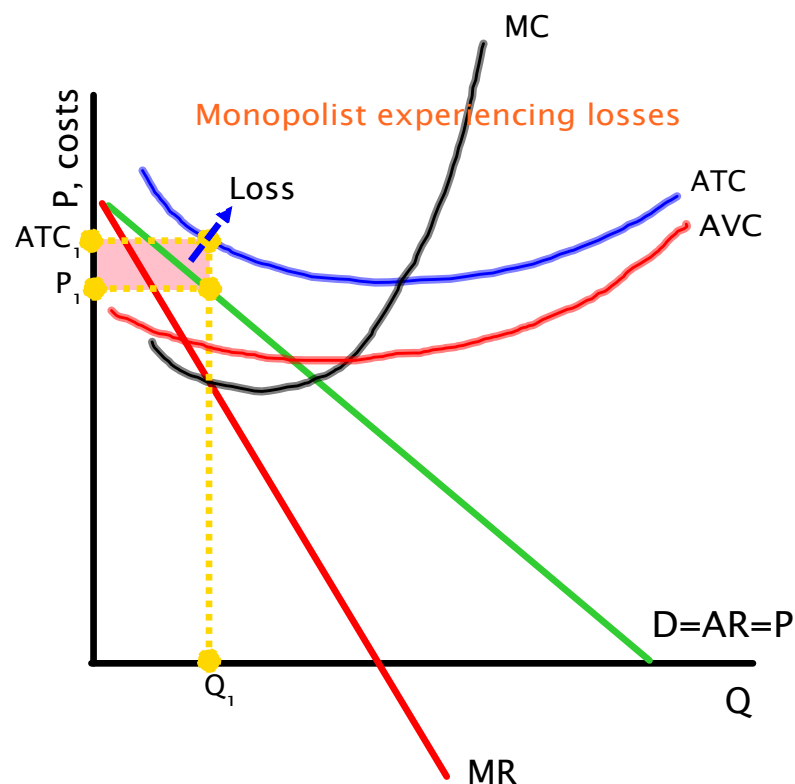
Profit maximization

Economic losses by a monopolist:

This monopolist experienced an increase in costs that eliminated its profits.

The area of loss equals the firm's $(ATC - AR) \times Q$.

In what case would this monopolist shut down?



The Shut-down Rule:

If the price at the profit-maximizing level of output is lower than the firm's average variable cost, then the firm would minimize its losses by shutting down. When $P < AVC$, the firm cannot even cover its variable costs of production

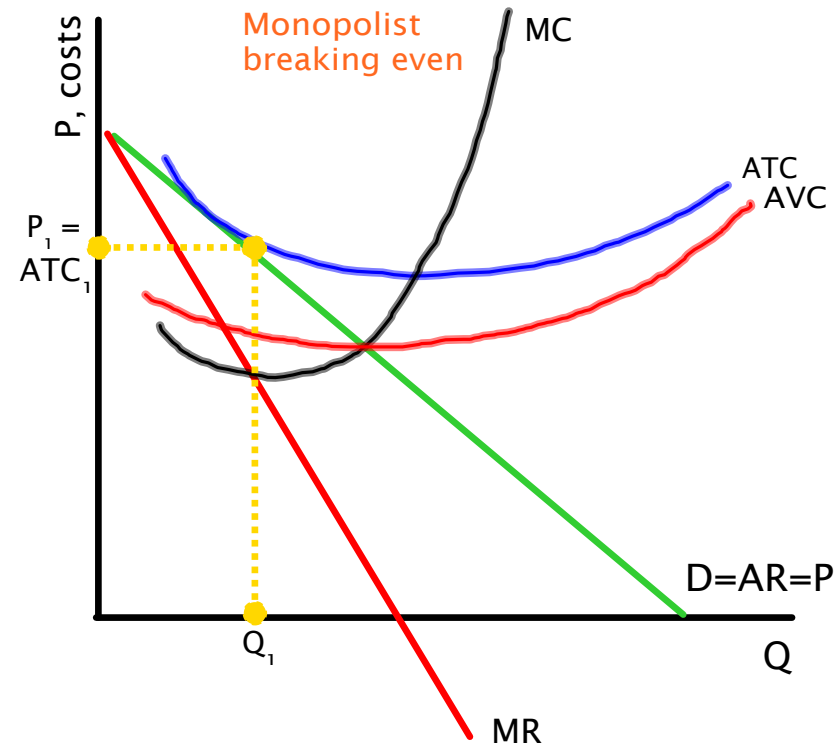
Monopoly

Profit maximization

A monopolist breaking even:

The firm is producing at the profit-maximizing level of output, where $MR=MC$

At Q_1 the firm's ATC equals its average revenue. The firm is covering all its explicit costs and earning a normal profit, but there are no economic profits.



If demand increases or if the firm lowers its costs, economic profits will be restored.

Monopoly

Barriers to Entry

Profits attract firms! *If a monopolistic firm is earning economic profits, there must be some reason new firms don not enter and eliminate profits as in competitive markets.*

Blog post: "Does Apple stand a chance?"

Barriers to entry:



Economies of Scale: If economies of scale occurs over a wide range of output, it is possible that the total market demand is limited to a level at which only a single large firm can achieve minimum average total cost. Potential new competitors are deterred from entering because they would be "too small to compete" with the existing monopolist.

Legal Barriers: Patents and licenses are methods for an innovative firm to protect its monopoly power over a particular market. For example, Microsoft's patent on the Windows operating system or Apples patent on the "click wheel" on its iPods give Microsoft and Apple monopoly power in the OS and the MP3 player markets.

Ownership of essential resources: Such as a mining company that owns the lands on which its mineral is mined, or the NBA which owns the contracts with the best basketball players in the US!

Pricing and strategic barriers: If one big company dominates a market without any of the above barriers, it may deter new entrants by slashing its prices (so it makes short term losses) when a new competitor enters. This keeps consumers from buying any of the new firm's output, since its higher costs prevent it from competing on price.

Monopoly

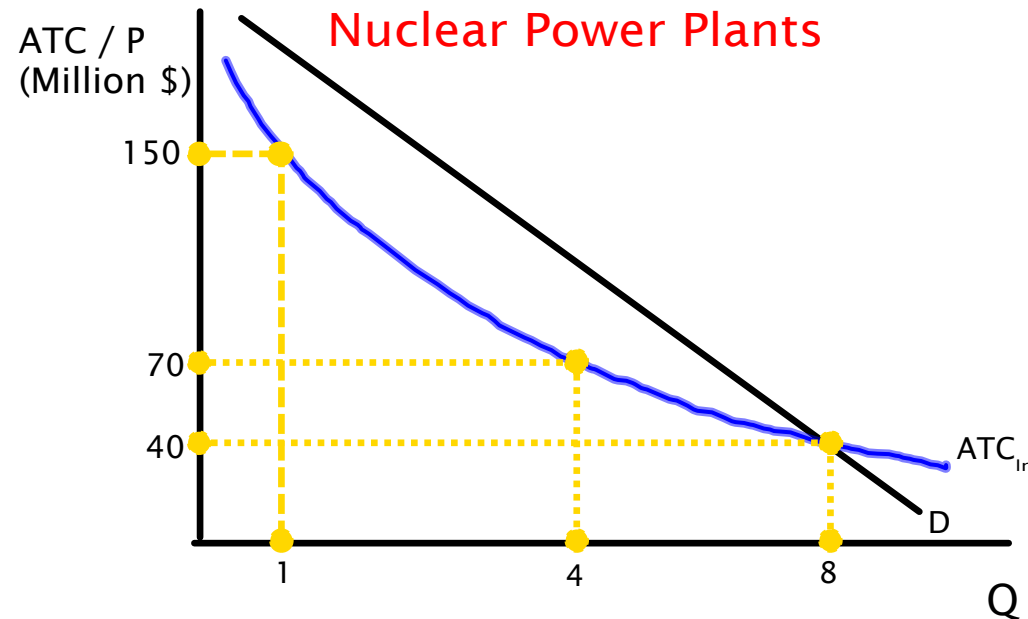
Natural Monopoly

Natural Monopoly:

If Demand intersects long-run average total cost while it is still downward sloping, then economies of scale present a barrier to entry.

Society is better off (more productively efficient) with only one firm producing this product.

This situation is known as a **Natural Monopoly**



Suppose total demand for nuclear power plants is 8 units.

- It would cost one firm a total of **\$320m** [8x40] to build eight plants
- It would cost two firms a total of **\$560m** [2(4x70)] to build eight plants
- It would cost 8 small firms a total of **\$1,200m** [8(150)] to build eight plants

The most efficient (least cost) production is achieved when only one firm produces all eight power plants. Building power plants requires large economies of scale. Total cost is minimized when one large firm builds all the plants.

Monopoly

Natural Monopoly - Regulated by Government

Sometimes the government regulates a firm's price or output decisions in order to achieve a more equitable or efficient allocation of resources towards certain goods or services.

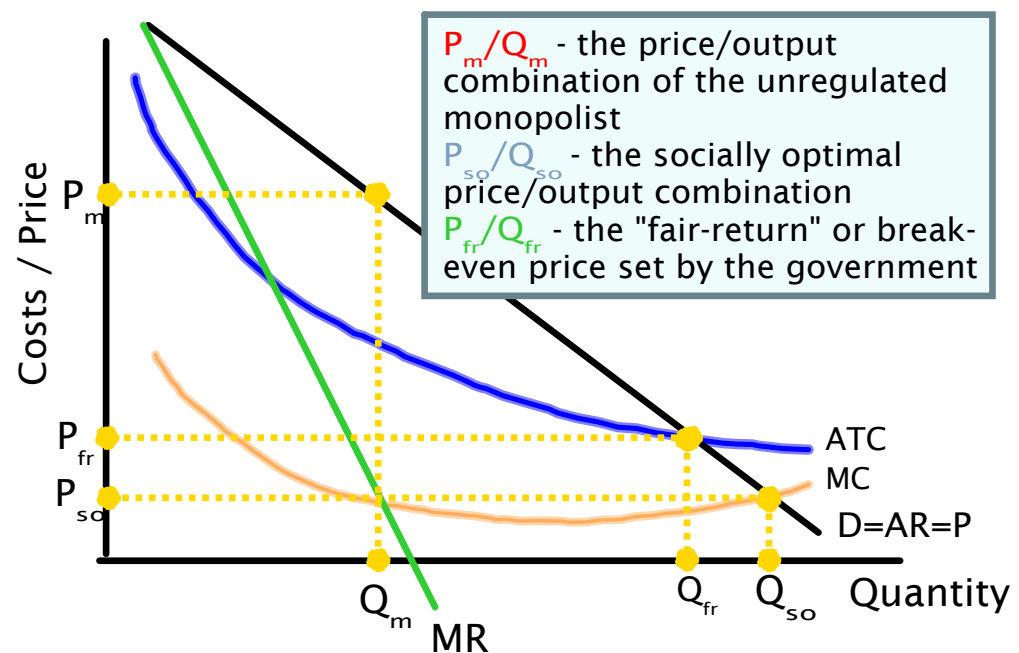
Who? -

- Natural monopolistic industries
- Product is considered a necessity to consumers i.e. electric utilities, natural gas, etc...

Why?

- Because of economies of scale, only one firm is likely to produce
- When firm produces at the profit-maximizing level of output, $P > MC$, meaning there is an *under-allocation* of resources in this market.
- Not enough is produced and the price is higher than socially optimal.

Natural Monopoly



How can the government regulate?

The government may set a **price ceiling** equal to the **socially optimal price** ($P=MC$).

OR equal to the firm's ATC, so that the firm can earn a normal profit. This is called **fair return price**

Blog Post: "To regulate or not to regulate"

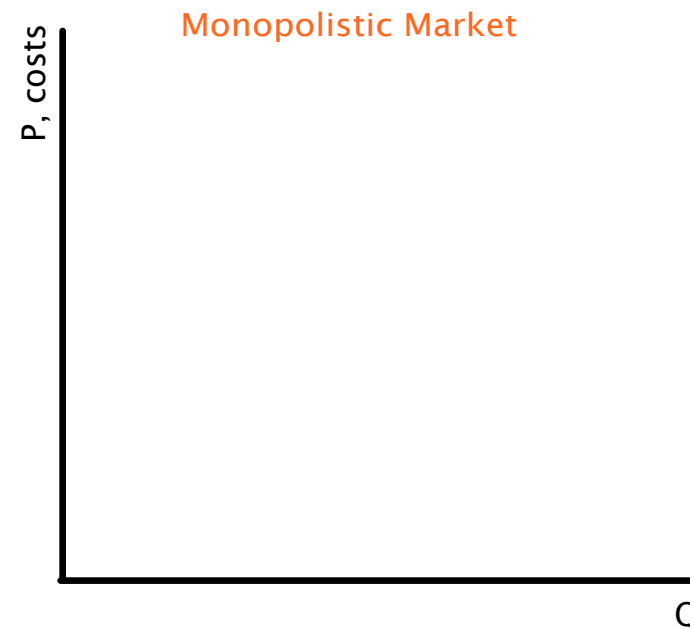
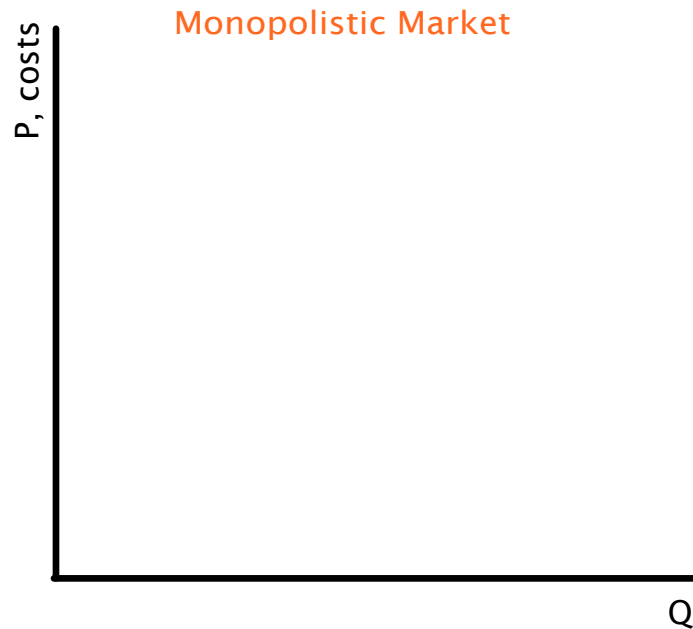


Monopoly

Practice problems

Illustrate the two scenarios below using a Monopoly diagram:

- a monopoly earning only a normal profit
- a monopoly experiencing economic losses



How can a monopolist, with all its market power, ever experience economic losses?

Monopoly

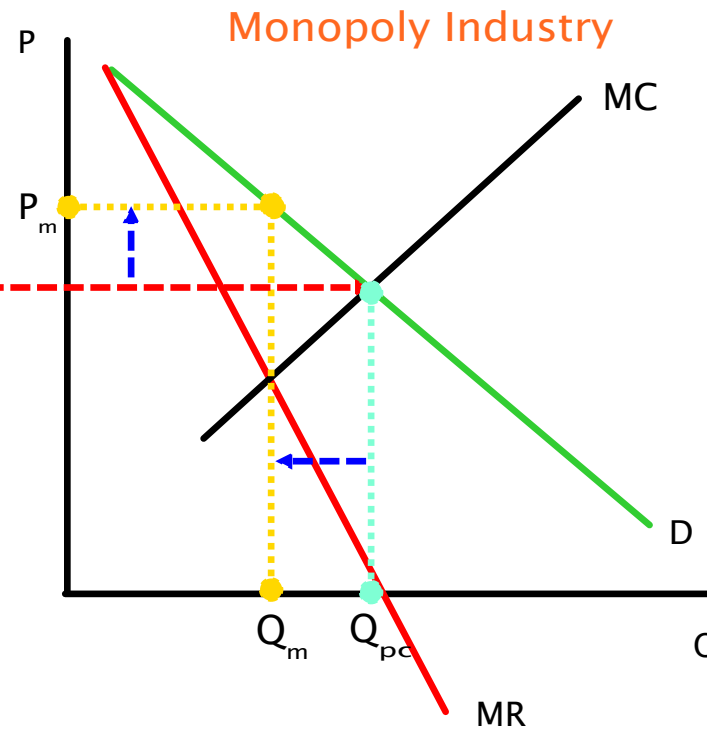
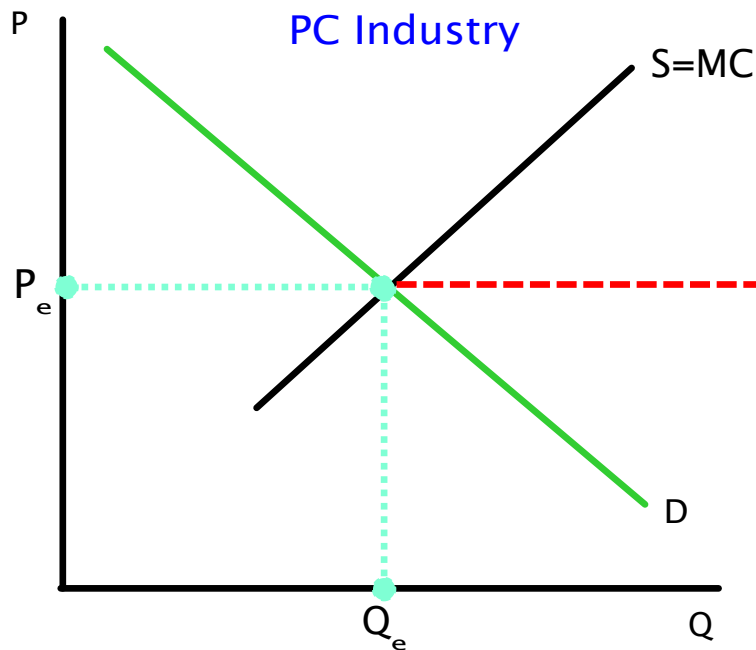
Economic effects

Effects of monopoly on price, output and efficiency

- Higher price
- Lower output
- $P > \min. ATC$: Productive inefficiency
- $P > MC$: Allocative inefficiency
(resources are under-allocated towards the product)

Efficiency Loss (Deadweight loss) occurs

- There is a loss of Consumer surplus in exchange for higher firm profit. DWL results
- Income transfer: consumers pay a higher price, shareholders of the monopoly enjoy higher profits.



Monopoly

Economic effects

Income Transfer:

Consumer surplus is lost b/c of higher price. Firm profits are higher b/c of market power. Compared to PC industries, monopolies represent a transfer of income from consumers to shareholders in the monopolistic firm.

Cost Issues with Monopoly:

- **Economies of scale:** Some monopolized industries have only one firm because economies of scale exist over such a wide range of output. It is possible that one or two large firms can achieve a lower ATC than many smaller firms. This is called a *natural monopoly*.
- **Simultaneous consumption:** One product can satisfy a large number of consumers at the same time. Example: Microsoft Windows. Marginal Cost for Microsoft is essentially nothing, so ATC_{LR} declines over the entire range of output.
- **Network effect:** describes the phenomenon of a product's value increasing the more users it has. Examples: cell phones, the internet, email, Facebook! Tends to move markets towards monopoly as more and more consumers flock to a product b/c of the "network" that develops around it.

Monopoly

Price discrimination

Price discrimination: *The charging of different prices to different consumers for the same product.*

Perfect price discrimination: *When every consumer pays exactly what he or she is willing to pay. The consumer has NO consumer surplus.*

Conditions that must exist for price discrimination to occur:

- **Monopoly Power:** possible only when a firm has market power
- **Market segregation:** firm must be able to segregate buyers based on their willingness to pay for the product, or their elasticities of demand
- **No resale:** the original buyer cannot be able to resell the product, or else they could undermine the the monopolist's market power

Blog posts: "Price Discrimination"



Monopoly

Price discrimination

Discussion Question: If you were the manager of a monopolistic firm, why would you LOVE to be able to practice perfect price discrimination?

Answer: By charging each consumer exactly what he or she is willing to pay, a firm maximizes the difference between its marginal revenue and its marginal cost. For each unit of output, the firm sells it to whoever is willing to pay the most. Thereby total profits are maximized and consumers experience ZERO surplus. Welfare is thereby transferred from consumers to the monopolist.

Examples of price discrimination:

Airline ticket pricing: Prices based on when ticket is bought, whether the traveller stays over a weekend, length of stay, etc...

Movie theaters: Matinee prices, senior and teen discounts, concession stands get more money from those whose willingness to pay for the movie experience is higher.

Golf courses and ski resorts: Weekend vs. mid-week rates, age discounts

Grocery stores: use coupons to attract consumers with more elastic demand for particular groceries, whose willingness to pay is lower.

Computer hardware and software: Microsoft and Apple offer student and educator discounts, since they know such consumers' willingness to pay is less than some.

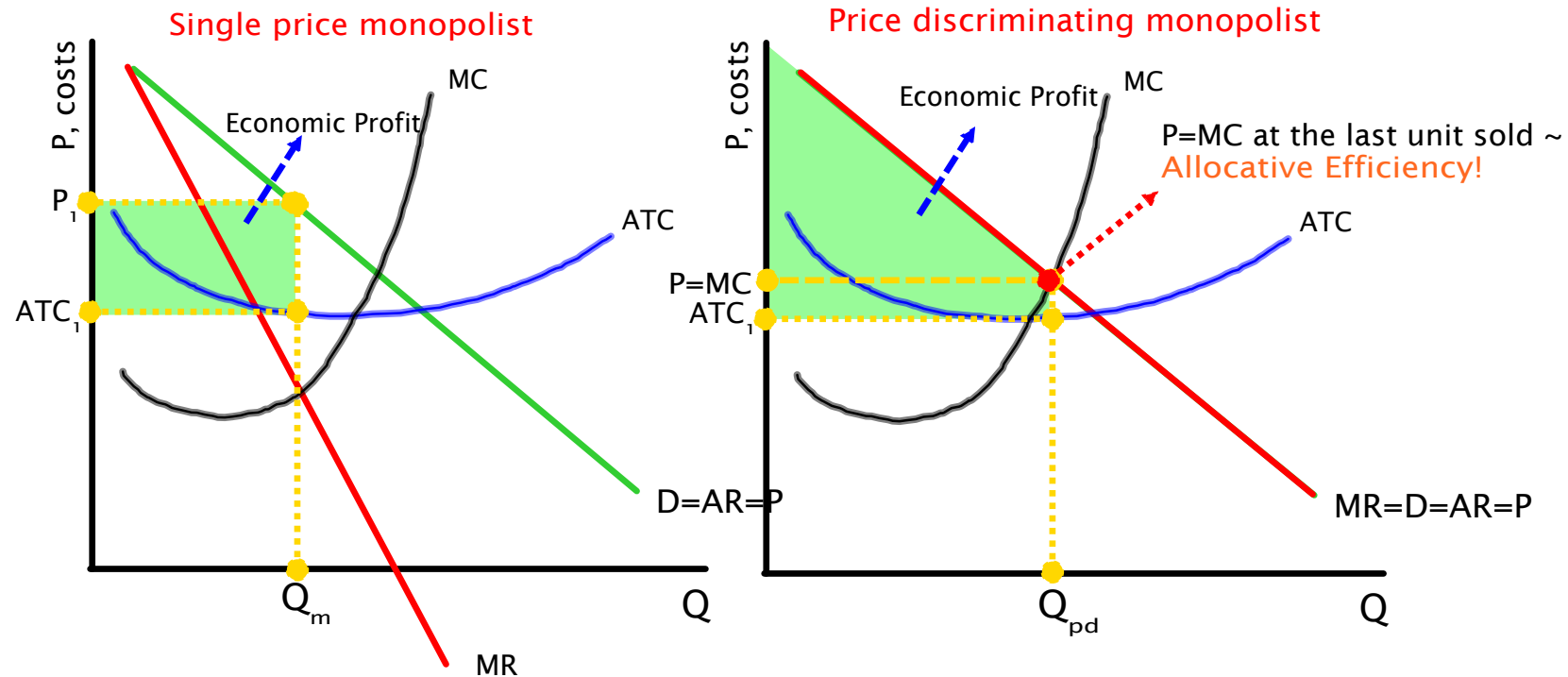
Blog Post: "Price Discrimination 101"



Monopoly

Consequences of price discrimination

- More profit for the firm: green triangle bigger than the green rectangle
- More output: Q_{pd} is greater than Q_m
- Zero consumer surplus: only in perfect price discrimination
- Greater allocative efficiency: the last price paid equal MC

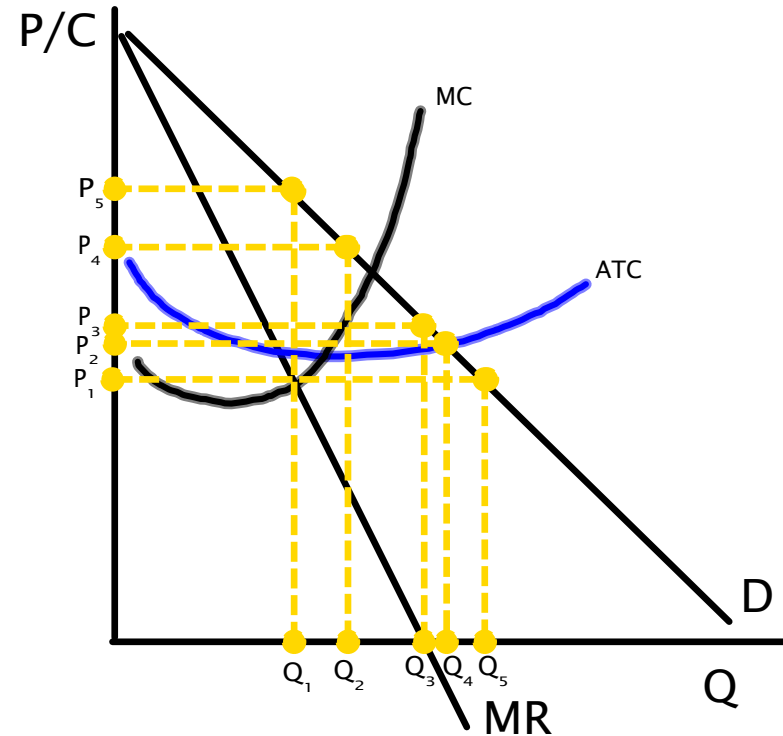


When a firm can perfectly price discriminate, it will charge each customer exactly what he is willing to pay. Therefore, $MR = Price$, since the firm does not have to lower the price of all previous units to sell additional output. **$P=MC=MR$**

Monopoly

Practice Free Response Question

The diagram to the right shows the cost and revenue curves for a monopoly.



(a) How does a monopolist determine its profit-maximizing level of output and price?

(b) Using the information in the graph, identify each of the following for the monopolist.

- (i) The profit maximizing level of output and price
- (ii) The line segment of the demand curve that is elastic

(c) Suppose that the industry depicted in the graph became perfectly competitive without changing the demand or cost curves. Identify the equilibrium price and output that would prevail in the perfectly competitive market.

(d) Using the information in the graph, identify the area of consumer surplus for each of the following.

- (i) The profit-maximizing monopoly
- (ii) The perfectly competitive industry

(e) Define allocative efficiency

(f) To be allocatively efficient, what level of output should the monopolist produce?

(g) Should the government use a per-unit tax or a per-unit subsidy to lead the monopolist to produce the allocatively efficient level of output? Explain how this tax or subsidy would achieve the allocatively efficient level of output?