Part III: Market Structure

12. Monopoly
13. Game Theory and Strategic Play
14. Oligopoly and Monopolistic Competition

Chapter 12
Monopoly

2015.12.11.

Evidence-Based Economics

Q: Can a monopoly ever be good for society?

KEY IDEAS

- Monopoly represents an extreme market structure with a single seller.
- Monopolies arise both naturally and through government protection.
- Monopolists are price-makers and produce at the point where marginal revenue equals marginal cost.

KEY IDEAS

- The monopolist maximizes profits by producing a lower quantity and charging a higher price than perfectly competitive sellers. By doing so, deadweight loss results.
- Efficiency can be established in a monopoly through first-degree price discrimination or government intervention.

12.1 Introducing a New Market Structure

- **Price maker**
  Sellers that can set the price of a good.
- **Market power**
  The ability to set the price.
- **Monopoly**
  One seller of a good or service with no close substitutes.

	Perfect Competition	Monopoly
Number of Firms/Sellers/ Producers	Many	One
Type of Product/Service Sold	Identical (homogeneous)	Good or service with no close substitutes
Example of Product	Corn grown by various farmers	Patented drugs; tap water
Barriers to Entry	None: free entry and exit	Yes: high
Price-Taker or Price-Maker?	Price-taker; price given by the market	Price-maker—no competitors; no close substitutes
Price	$P = MR = MC$	Set $P > MR = MC$
Demand Curve Facing the Firm	Horizontally sloped; perfectly elastic demand curve	Downward-sloping
Social Surplus	Maximized	Not maximized, but sometimes society benefits from research and development
Equilibrium Long Run Profits	Zero	Potentially greater than zero

Exhibit 12.1 Two Market Structures

12.2 Sources of Market Power

- For the monopolist, market power arises because of *barriers to entry*.
- **Barriers to entry** are obstacles that prevent potential competitors from entering the market.
- Two types of barriers to entry:
  1. Legal market power
  2. Natural market power
     - Control of key resources
     - Economies of scale

Legal Market Power

- **Legal market power** occurs when a firm obtains market power through barriers to entry created not by the firm itself, but by the government.
- **Patent**: Government-granted permission to be the sole producer and seller of a good for a specific period of time.
- **Copyright**: Government-granted exclusive rights to the creator of literary or artistic work.
- Other government regulations.

Natural Market Power

- **Natural market power** occurs when a firm obtains market power through barriers to entry created by the firm itself.
- Two main sources of natural market power:
  - The monopolist owns or controls a *key resource* necessary for production.
  - There are *economics of scale* in production over the relevant range of output.

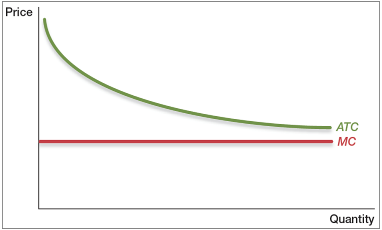


Exhibit 12.2 Average Total Cost and Marginal Cost for a Natural Monopoly

12.3 The Monopolist's Problem

- Can a monopolist charge any price it wants to?

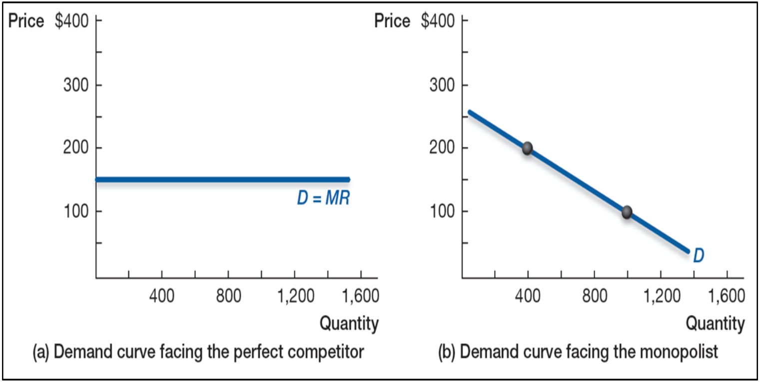


Exhibit 12.3 Perfectly Competitive Firms and Monopolies Face Different Demand Curves

Revenue Curves

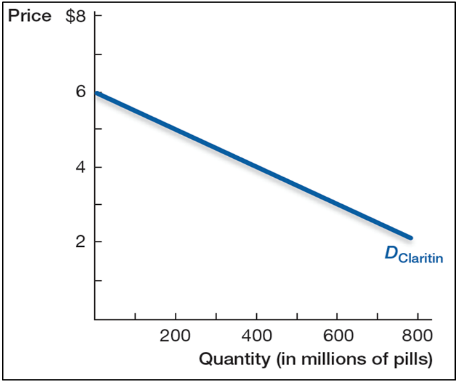


Exhibit 12.4 The Market Demand Curve for Claritin

- The important trade-off between price and quantity sold that the monopolist faces: a higher price yields more revenue per unit sold, but fewer number of units sold.

Quantity (in millions)	Price	Total Revenue (in millions)	Marginal Revenue	Total Cost (in millions)	Fixed Cost (in millions)	Marginal Cost	ATC
100	$5.50	$ 550	$ 5	$ 110	$10	$1.00	$1.10
200	$5.00	$1,000	$ 4	$ 210	$10	$1.00	$1.05
300	$4.50	$1,350	$ 3	$ 310	$10	$1.00	$1.033
400	$4.00	$1,600	$ 2	$ 410	$10	$1.00	$1.025
500	$3.50	$1,750	$ 1	$ 510	$10	$1.00	$1.02
600	$3.00	$1,800	$ 0	$ 610	$10	$1.00	$1.017
700	$2.50	$1,750	$-1	$ 710	$10	$1.00	$1.014
800	$2.00	$1,600	$-2	$ 810	$10	$1.00	$1.013
900	$1.50	$1,350	$-3	$ 910	$10	$1.00	$1.011
1000	$1.00	$1,000	$-4	$1,010	$10	$1.00	$1.01
1100	$0.50	$ 550	$-5	$1,110	$10	$1.00	$1.009

Exhibit 12.5 Revenues and Costs for Claritin at Different Levels of Output

- Fixed costs are relatively large and the marginal cost is constant over the various output levels.
- Price > Marginal Revenue at every level of output.

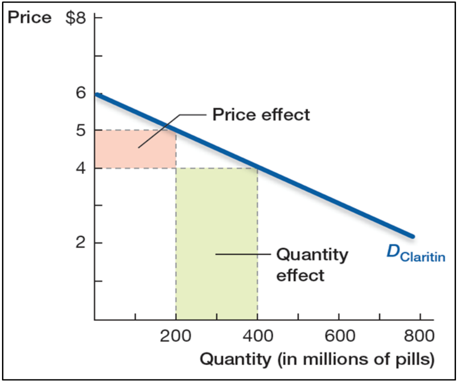


Exhibit 12.6 The Quantity Effect and the Price Effect on Revenues for Charitin

Lower the price from $5 to $4 will bring in $600 millions more in total revenues. It arises from two effects.

- *quantity effect*: green area, $800 million.
- *price effect*: pink area, loss $200 million.

Price, Marginal Revenue, and Total Revenue

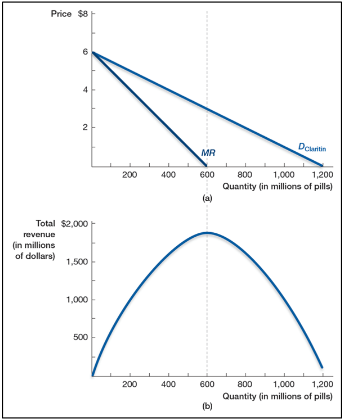


Exhibit 12.7 Relationship Among Price, Marginal Revenue, and Total Revenue

- Marginal revenue curve is always below demand curve.
- When total revenue is rising (falling), marginal revenue is positive (negative).

12.4 Choosing the Optimal Quantity and Price

- To maximize profits, the firm will choose the optimal quantity where marginal revenue equals to marginal cost.
- For a perfectly competitive firm, marginal revenue equals to market price.
- For a monopoly firm, marginal revenue is different form market price.

Producing the Optimal Quantity

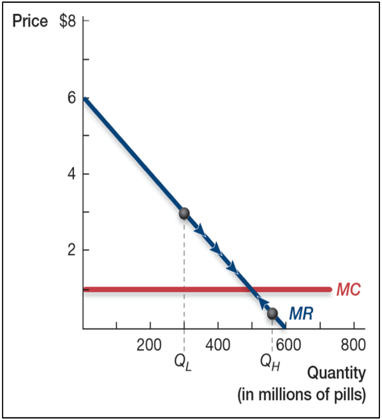


Exhibit 12.8 Marginal Revenue and Marginal Cost for Claritin

- At Q_L, $MR > MC$, increase Q.
- At Q_H, $MR < MC$, reduces Q.

Setting the Optimal Price

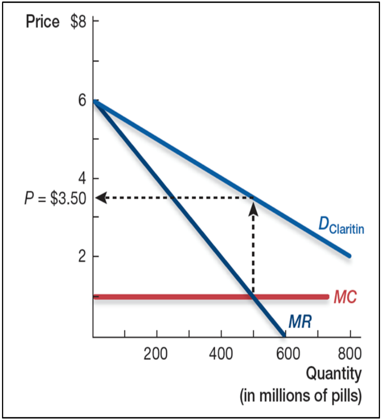


Exhibit 12.9 Choosing the Profit-Maximizing Price for Claritin

Expand Q until $MC = MR$ → Produce Q at that point → Trace up to the demand curve → Find P associated with Q

How a Monopolist Calculates Profits

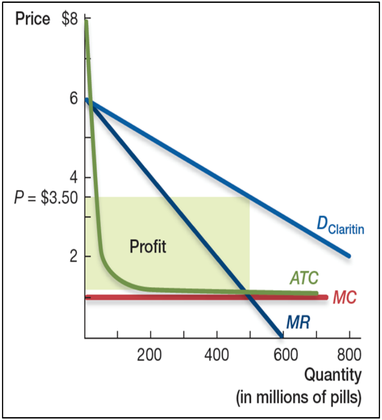


Exhibit 12.10 Computing Profits for a Monopolist
Price for Claritin

Profits=Total revenue-Total cost=

$$(P \times Q) - (ATC \times Q) = (P - ATC) \times Q$$

Does a Monopoly Have a Supply Curve?

- A supply curve answers the question:
  If the price is P, how many units does the firm want to produce?
- Monopolists, as price maker, do not vary their production based on the market price because *they set the price.*
- They do not have a supply curve.

12.5 The "Broken" Invisible Hand: The Cost of Monopoly

- The power of invisible hand is such that even in markets composed of only self-interested people, the overall well-being of society is maximized.
- One important factor that can "break" the powerful result of the invisible hand is market power.
- A firm that exercises market power causes a reallocation of resources toward itself, thereby sacrificing social surplus.

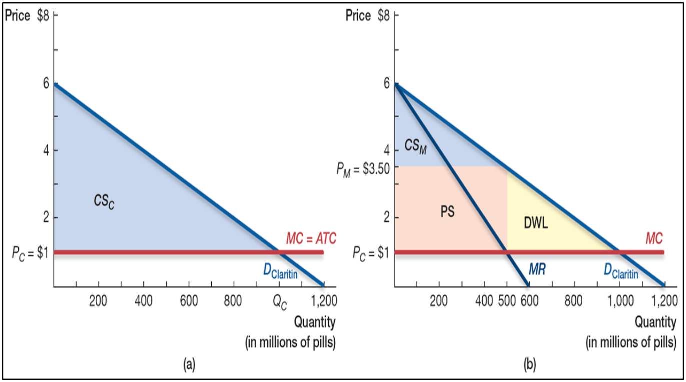


Exhibit 12.11 Surplus Allocations: Perfect Competition Versus Monopoly

- In 1981, Schering-Plough was awarded a patent on Claritin.
- Twenty years later, Schering-Polugh's monopoly rights expired, and generic prescription drug companies could suddenly enter the market and sell close substitutes.

12.6 Restoring Efficiency

Buyer	Willingness-to-Pay	Marginal Cost
Augie	$5	$1
Gary	$4	$1
Joyce	$3	$1
Dawn	$2	$1
Sandi	$1.50	$1

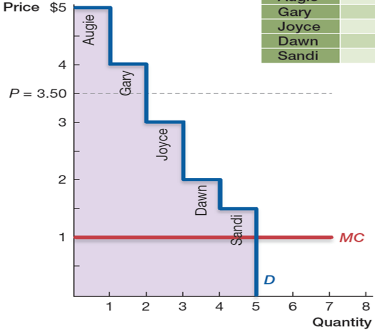


Exhibit 12.12 Select Individuals Who Value Claritin

- At the monopolist's price of $3.50, only Augie and Gary buy Claritin.

- One way to restore social efficiency is to have a social planner choose the monopolist's quantity and price.
- The "all-knowing" social planner would need to know both the monopolist's marginal cost and the buyer's willingness to pay for the Claritin pill.
- The social planner would want consumers like Joyce, Dawn and Sandi to buy Claritin because their willingness-to-pay values are all higher than the marginal cost.
- The social planner could choose the same outcome as that which results in the perfectly competitive equilibrium because that outcome maximizes social surplus.

Three Degrees of Price Discrimination

- **Price discrimination** occurs when firms charge different consumers different prices for the same good or service.
- Provided that buyers can not resell the low price good, companies might be able to enhance their profits by engaging in price discrimination.

Three types of price discrimination:

- **First-degree**, or **perfect price discrimination**, in which consumers are charged the maximum price they are willing to pay.
- **Second-degree price discrimination**, in which consumers are charged different prices based on characteristics of their purchase, such as quantity they purchase.
- **Third-degree price discrimination**, in which different groups of consumers are charged different prices based on their own attributes (such as age, gender, location and so on)

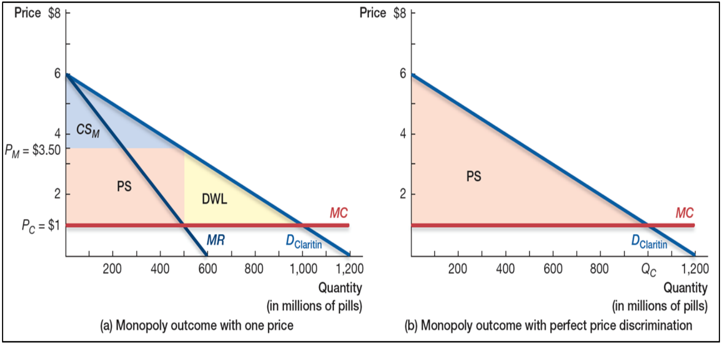


Exhibit 12.13 Surplus Allocations for a Monopoly: With and Without Perfect Price Discrimination

- If the monopolist is able to perfectly price discriminate, then the outcome would be not only to maximize profits but *also* maximize social surplus
- Under perfect price discrimination, both consumer surplus and deadweight loss become producer surplus.
- Perfect price discrimination is *socially efficient*.

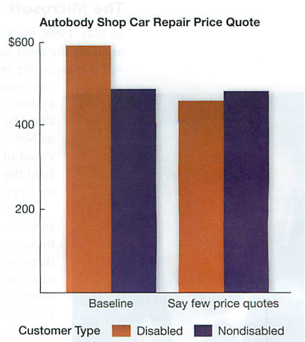
- While in practice perfect price discrimination is difficult, third-degree price discrimination affects all of us daily.
- Movie theatres, restaurants, golf courses, and the like charge a lower price to children and senior citizens.
- These are attempts to price discriminate based on an observable characteristic that the seller believes is correlated to the consumer's willingness to pay.

Examples of second-degree price discrimination:

- Apple gives discounts if you purchase a large quantity of song downloads.
- Tire salesman sell four tires for $200 and one for $75.
- Bakeries sell a dozen doughnuts for $7, two doughnuts for $1.5.

LETTING THE DATA SPEAK

Third-Degree Price Discrimination in Action



- An experiment that have randomized whether a disabled or non-disabled person brings a banged up car to an auto repair shop.
- The same study adding the following line when they were getting a quote, "I am getting a few price quotes today."

12.7 Government Policy Toward Monopoly

- The purpose of **antitrust policy** is to prevent anti-competitive pricing, low quantities, and deadweight loss from emerging and dominating markets.
- The goal of antitrust policy is to keep markets open and competitive.
- In the U.S., antitrust policy stated in 1890 with the Sherman Act, which prohibited any agreements or actions that would put restraints on trade— in essence, prohibiting anything to do with monopolizing markets.

The Microsoft Case

- In May 1998, the Department of Justice filed a lawsuit under the Sherman Act against arguably the most successful corporation of the 1990s, Microsoft.
- It claimed that Microsoft was engaging in unfair practices in order to monopolize the market.
  - Bundling Windows operating system with its Internet Explorer browser.
  - Microsoft made it effectively impossible for alternative browsers, such as Netscape, to maintain a large market share.
- The suit was filed the day Windows 98 was released with Internet Explorer bundled into the operating system.

- The ruling went against Microsoft both in the U.S. and in Europe.
- Microsoft was not broken up into two separate firms. (one for operating system and one for applications)
- But had to change marketing practices and make it easier for other browsers to work with Windows.
- What should be considered monopoly power in today's new and dynamic industries? Could Microsoft really develop a monopoly in the same way Standard Oil did in the oil business?

Price Regulation

- One government solution has been to allow the monopoly to keep its market share but regulate the price it may charge.
- What is the "fair" price a monopolist may charge?
- Setting price at marginal cost is called the **efficient** or **socially optimal price**.
  - However, as ATC is falling, marginal cost is less than ATC, the firm will experience an economic loss.
- Setting price at average total cost is called a **fair-returns price**.
  - Although this price does not maximize surplus, it does allow the monopolist to make zero economic profit.

Evidence-Based Economics

Q: Can a monopoly ever be good for society?

- If we allow a firm to have monopoly power, we are assuredly not maximizing social surplus because of deadweight loss.
- If we do not grant innovators protection, we might not experience a wide variety of goods and services because profits may not be available to spur invention.
- The monopoly power enjoyed by patent and copyright holders may both spur and hinder innovation.
- The optimal policy for granting innovators a monopoly over their invention should balance these costs and benefits.