

Pricing Strategies for Firms with Market Power



Introduction (1/1)

In Chapter 9, we examined how firms with market power can generate positive economic profit by influencing the price at which their products or services are sold – *but this is based on the assumption that firms must charge the same price to all customers.*

In this chapter, we explore alternative pricing strategies and show that when a firm with market power can discriminate among customers, additional surplus (beyond that achieved by a single-price monopolist) can be generated.

Chapter Outline:

- 10.1** The Basics of Pricing Strategy
- 10.2** Direct Price Discrimination I: Perfect (First-Degree) Price Discrimination
- 10.3** Direct Price Discrimination II: Segmenting (Third-Degree) Price Discrimination
- 10.4** Indirect (Second-Degree) Price Discrimination
- 10.5** Bundling
- 10.6** Advanced Pricing Strategies
- 10.7** Conclusion

The Basics of Pricing Strategy (1/5)

A **pricing strategy** is a firm's plan for setting the price of its product given the market conditions it faces and its desire to maximize profit.

For a perfectly competitive firm, the pricing strategy is straightforward: charge the equilibrium market price and take zero economic profit in the long run.

For firms with market power, strategies can become more complex.

- For a single-price producer, the optimal strategy is to increase production until marginal revenue is equal to marginal cost, which yields maximum profit.
- However, some firms with market power are able to charge different prices to different customers (*price discrimination*).

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

The Basics of Pricing Strategy (2/5)

When Can a Firm Price Discriminate?

There are two requirements:

1. The firm must have market power.

- Without market power, firms must charge all customers the market equilibrium price.

2. The firm must prevent resale and arbitrage.

- **Arbitrage** is the practice of reselling a product at a price higher than its original selling price.
- If this requirement is not met, customers subject to a lower price could simply purchase excess product and resell to those facing the higher price.

The Basics of Pricing Strategy (3/5)

Ultimately, the exact kind of pricing strategy will depend on the information available to the firm.

1. If a firm can identify its customers' demands *before* they buy...

- It can practice *direct price discrimination* and charge different prices to different customers based on observable characteristics of the customers.
- If the firm has detailed and complete information about each customer's own demand curve before he/she buys, it can practice *perfect or first-degree price discrimination* (Section 10.2).
- If the information about the firm's customers is less detailed, a firm may be able to discriminate by customer group, which is called *segmenting or third-degree price discrimination* (Section 10.3).

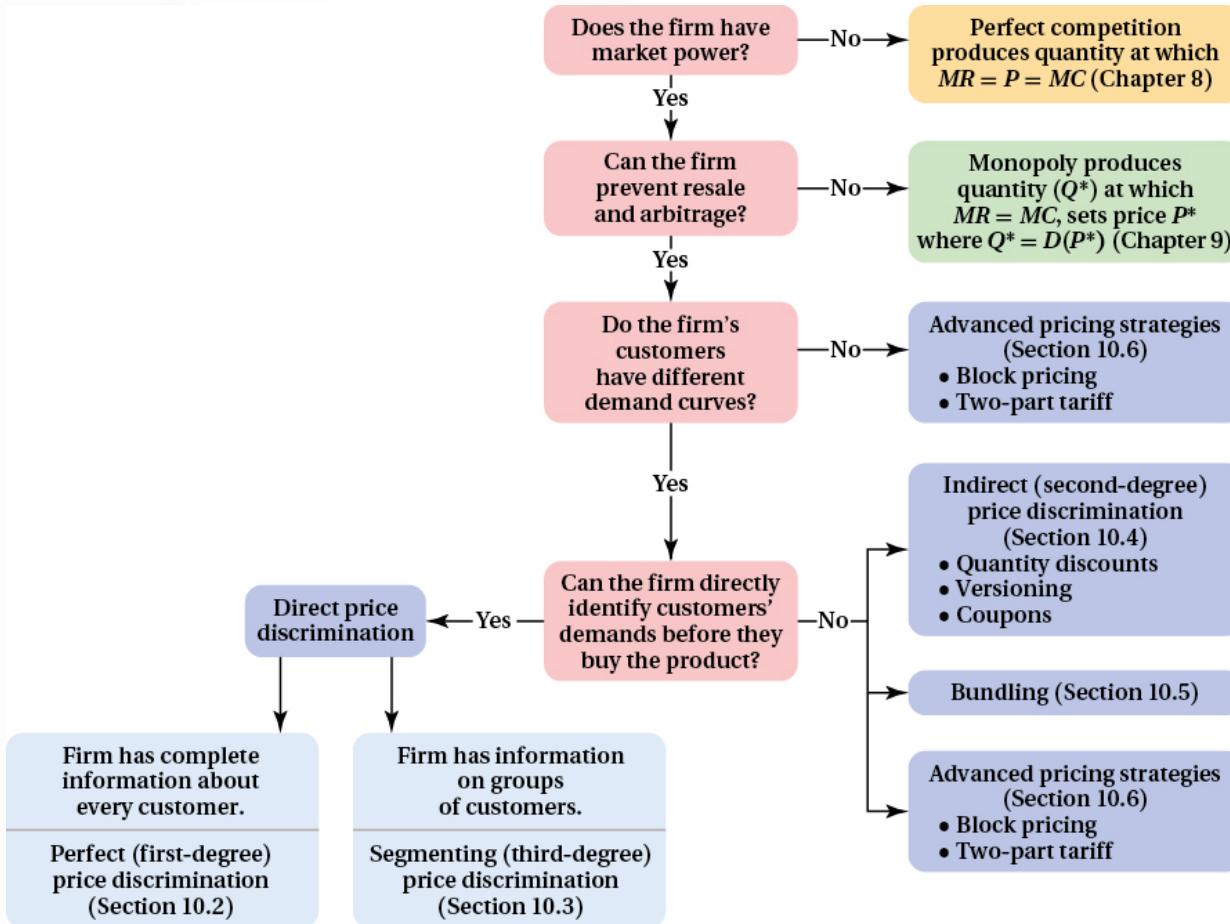
The Basics of Pricing Strategy (4/5)

2. If a firm can identify its customers differing demands only *after* they make a purchase...
 - The firm can try *indirect or second-degree price discrimination* (Section 10.4).
 - Under the right conditions, firms can also make a pricing package by *bundling* together different products (Section 10.5).
 - It can also pursue *block pricing* and *two-part tariffs* (Section 10.6)
3. If a firm's customers have the same demand curves...
 - There are still some pricing strategies that a firm can use to make more profit such as *block pricing* and *two-part tariffs* (Section 10.6)

Figure 10.1 summarizes this information.

The Basics of Pricing Strategy (5/5)

Figure 10.1 Overview of Pricing Strategies



Direct Price Discrimination I: Perfect (First-Degree) Price Discrimination (1/3)

When to Use It: Perfect (First-Degree) Price Discrimination

1. The firm has market power and can prevent resale.
2. The firm's customers have different demand curves.
3. The firm has complete information about every customer and can identify each one's level of demand before purchase.

If a firm is able to observe characteristics of demand prior to purchase, it can increase producer surplus through **direct price discrimination**.

- A pricing strategy in which firms charge different prices to different customers based on observable characteristics of the customers

Direct Price Discrimination I: Perfect (First-Degree) Price Discrimination (2/3)

When to Use It: Perfect (First-Degree) Price Discrimination

In the extreme case that the firm has complete information about customers, it can engage in **perfect price discrimination**.

- Also called **first-degree price discrimination**, it is a type of direct price discrimination in which a firm charges each customer exactly according to his or her willingness to pay.

What does this mean for consumer surplus?

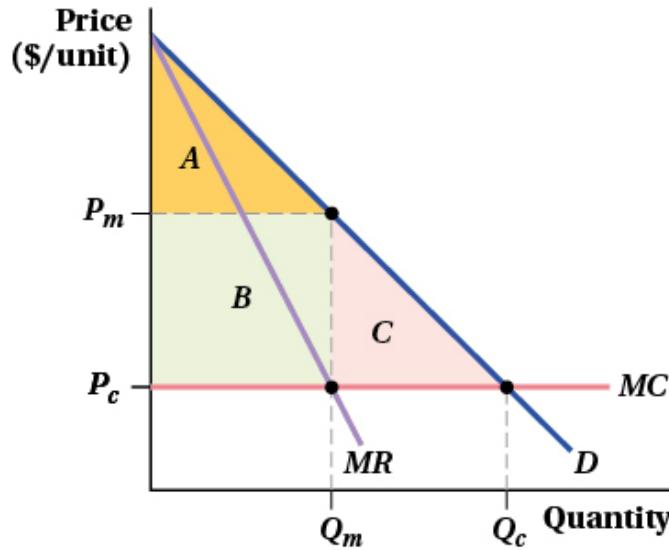
It is driven to zero under perfect price discrimination!

Direct Price Discrimination I: Perfect (First-Degree) Price Discrimination (3/3)

Figure 10.2 Perfect (First-Degree) Price Discrimination

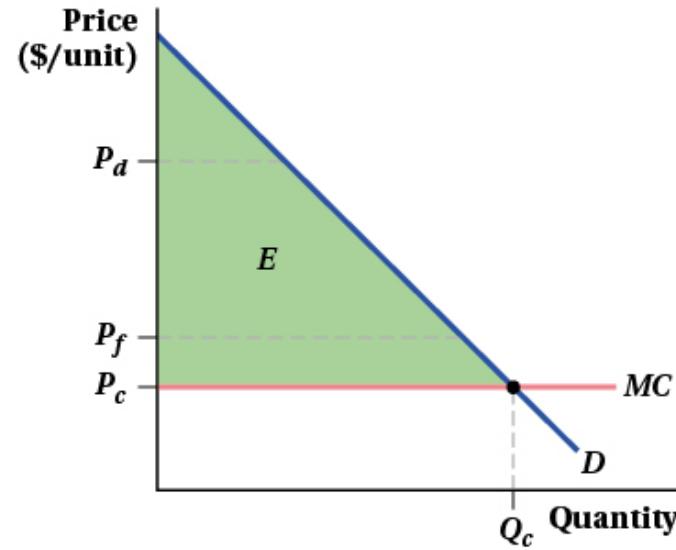
(a) Perfect competition and monopoly

Consumer surplus (competition)	$= A + B + C$
Producer surplus (competition)	$= 0$
Consumer surplus (market power)	$= A$
Producer surplus (market power)	$= B$
Deadweight loss from market power	$= C$



(b) Perfect price discrimination

Consumer surplus	$= 0$
Producer surplus	$= E$
Deadweight loss from market power	$= 0$



Direct Price Discrimination II: Segmenting (Third-Degree) Price Discrimination (1/14)

When to Use It: Segmenting (Third-Degree) Price Discrimination

1. The firm has market power and can prevent resale.
2. The firm's customers have different demand curves.
3. The firm can directly identify specific *groups* of customers (but not individual customers) with different price sensitivities before purchase.

Direct Price Discrimination II: Segmenting (Third-Degree) Price Discrimination (2/14)

When to Use It: Segmenting (Third-Degree) Price Discrimination

In most cases, direct price discrimination requires too much information; however, firms may be able to use common characteristics to engage in **segmenting (third degree price discrimination)**.

- A type of direct price discrimination in which a firm charges different prices to different groups (segments) of customers based on the identifiable attributes of those groups.
- In **third-degree price discrimination**, a firm is able to extract surplus in excess of that collected by a single-price monopolist but not as much as under first-degree price discrimination.
 - Examples: senior citizen and student discounts

Direct Price Discrimination II: Segmenting (Third-Degree) Price Discrimination (3/14)

Consider an example with two consumer groups:

The Ironman Cozumel 70.3 Triathlon is a prestigious annual race. Two types of consumers would like to enter the race:

1. Locals
2. People who fly in from somewhere else (usually the United States)

Do you think this situation might present a good case for third-degree price discrimination?

- Does the firm have market power?
 - Yes, this is a well-known, prestigious event.
- Do the customers have different demand curves?
 - It is reasonable to think that international customers may have different demand characteristics from those of the locals.
- Can the firm identify groups and prevent resale?
 - Yes, requiring identification should allow for effective segmentation.

Direct Price Discrimination II: Segmenting (Third-Degree) Price Discrimination (4/14)

How might the demand curves differ between local and international customers?

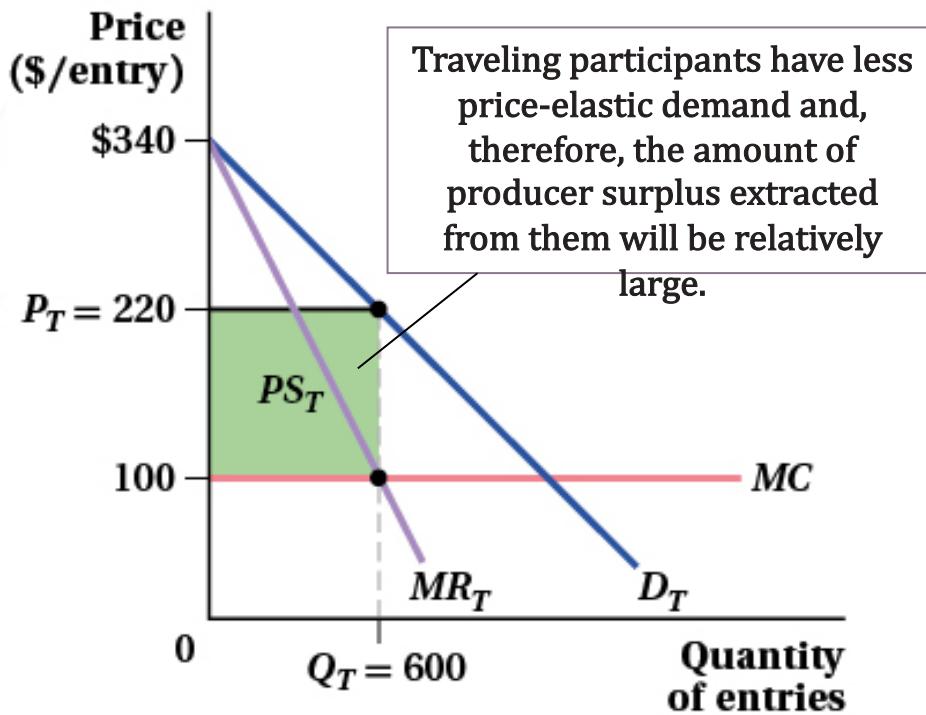
- Income differences between U.S. and Mexican triathletes
 - U.S. competitors are likely to have higher incomes and be less sensitive to the fee.
- The entrance fee as a share of total cost of attending the triathlon (airfare, hotel, etc.) is smaller for international athletes, which should make them less sensitive to the fee.

The two consumer groups can be described graphically.

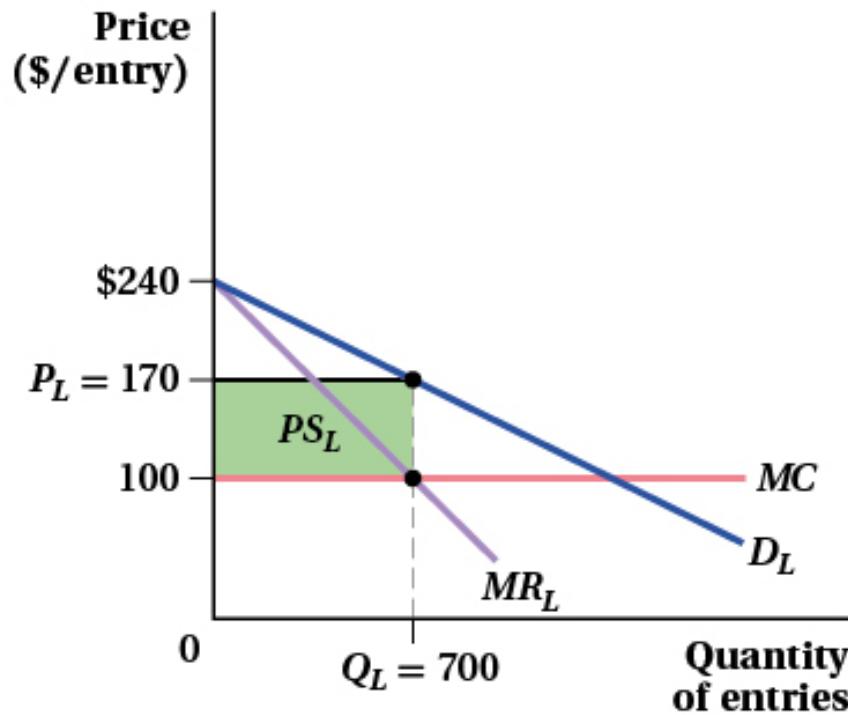
Direct Price Discrimination II: Segmenting (Third-Degree) Price Discrimination (5/14)

Figure 10.3 Segmenting Entry Fees at the Ironman Cozumel 70.3 Triathlon

(a) Traveling participants



(b) Local participants



Direct Price Discrimination II: Segmenting (Third-Degree) Price Discrimination (6/14)

The Benefits of Segmenting: A Mathematical Approach

Traveling triathlon participants have demand

$$Q_T = 1,700 - 5P_T$$

while locals have demand

$$Q_L = 2,400 - 10P_L$$

As suggested, locals are more price-sensitive than travelers.

The marginal cost to the organizer of adding participants is assumed to be constant at \$100.

Direct Price Discrimination II: Segmenting (Third-Degree) Price Discrimination (7/14)

We follow the steps from Chapter 9 and first determine the marginal revenue curves for each group of participants.

Travelers

$$Q_T = 1,700 - 5P_T$$

$$P_T = 340 - 0.2Q_T$$

$$MR_T = 340 - 0.4Q_T$$

Locals

$$Q_L = 2,400 - 10P_L$$

$$P_L = 240 - 0.1Q_L$$

$$MR_L = 240 - 0.2Q_L$$

Direct Price Discrimination II: Segmenting (Third-Degree) Price Discrimination (8/14)

Setting marginal revenue equal to marginal cost for each group:

Travelers

$$MR_T = MC$$

$$340 - 0.4Q_T = 100$$

$$Q_T = 600$$

Locals

$$MR_L = MC$$

$$240 - 0.2Q_L = 100$$

$$Q_L = 700$$

And using the demand curves to solve for price:

Travelers

$$P_T = 340 - 0.2Q_T = \$200$$

Locals

$$P_L = 240 - 0.1Q_L = \$170$$

Direct Price Discrimination II: Segmenting (Third-Degree) Price Discrimination (9/14)

Total producer surplus is the area below price but above marginal cost, summed over the two consumer groups:

Travelers

$$PS_T = (220 - 100) \times 600$$

$$= \$72,000$$

Locals

$$PS_L = (170 - 100) \times 700$$

$$= \$49,000$$

$$PS_{\text{combined}} = \$121,000$$

How does this compare to the single-price monopolist?

Direct Price Discrimination II: Segmenting (Third-Degree) Price Discrimination (10/14)

First, find the equation for the market demand area to the right of the kink is

$$Q = 1,700 - 5P + 2,400 - 15P = 4,100 - 15P$$

Inverse demand is $P = \frac{4,100}{15} - \frac{Q}{15}$

and marginal revenue is $MR = \frac{4,100}{15} - \frac{2Q}{15}$

Setting marginal revenue equal to marginal cost yields the single-price equilibrium quantity $MR = MC \rightarrow \frac{4,100}{15} - \frac{2Q}{15} = 100 \Rightarrow Q = 1,300$

Direct Price Discrimination II: Segmenting (Third-Degree) Price Discrimination (11/14)

And plugging in 1,300 to the market demand curve yields

$$P = \frac{4,100}{15} - \frac{1,300}{15} = \$186.67$$

As expected, the market price is slightly higher than the local price under segmentation but lower than the traveler price.

Producer surplus for the single-price monopolist is

$$PS = (186.67 - 100) \times 1,300 - \$112,671$$

This is less than the \$121,000 achieved when the market can be segmented.

Direct Price Discrimination II: Segmenting (Third-Degree) Price Discrimination (12/14)

How Much Should Each Segment Be Charged?

Segmenting monopolists treat each segment as a different market.

- Therefore, the Lerner index can be used to compute the optimal markup for each segment.
- From Chapter 9, the markup formula is given as

$$\underbrace{\frac{(P - MC)}{P}}_{\% \text{ mark up}} = \frac{1}{-E^D}$$

The monopolist will solve this formula for each segment.

Direct Price Discrimination II: Segmenting (Third-Degree) Price Discrimination (13/14): Question 1

Suppose an upscale movie theater has two locations—one in Boston, MA and one in Charlotte, NC. In Boston, the price elasticity of demand is -3 and in Charlotte, it is -2. If the marginal cost of movie ticket is \$6, what are the optimal prices in each location?

- A. Boston: \$9; Charlotte: \$12
- B. Boston: \$12; Charlotte: \$9
- C. Boston: \$8; Charlotte: \$10
- D. Boston: \$7; Charlotte: \$15

Direct Price Discrimination II: Segmenting (Third-Degree) Price Discrimination (13/14): Question 1 – Correct Answer

Suppose an upscale movie theater has two locations—one in Boston, MA, and one in Charlotte, NC. In Boston, the price elasticity of demand is -3 and in Charlotte, it is -2. If the marginal cost of movie ticket is \$6, what are the optimal prices in each location?

- A. **Boston: \$9; Charlotte: \$12 (correct answer)**
- B. Boston: \$12; Charlotte: \$9
- C. Boston: \$8; Charlotte: \$10
- D. Boston: \$7; Charlotte: \$15

Direct Price Discrimination II: Segmenting (Third-Degree) Price Discrimination (14/14)

Ways to Directly Segment Customers

By customer characteristics

- Age (e.g., senior citizen discounts)
- Gender (e.g., ladies night specials)
 - May sometimes run afoul of antidiscrimination laws

By past purchase behavior

- Repeat customers may be more price sensitive (e.g., software updates less expensive than initial purchase).

By location

- Based on local demand characteristics, prices are often different regionally (e.g., chain restaurants have higher prices in airports than other locations).

Over time

- Prices are higher when something is new as with games and hardcover books but, over time, the game will decrease in price and a paperback will be less expensive.

Indirect (Second-Degree) Price Discrimination (1/5)

When to Use It: Indirect (Second-Degree) Price Discrimination

1. The firm has market power and can prevent resale.
2. The firm's customers have different demand curves.
3. The firm cannot directly identify which customers have which type of demand before purchase.

Indirect (second-degree) price discrimination is a pricing strategy in which customers pick among a variety of pricing options offered by the firm.

Indirect (Second-Degree) Price Discrimination (2/5)

Indirect (Second-Degree) Price Discrimination through Quantity Discounts

Firms often use **quantity discounts** to price-discriminate.

- The practice of charging a lower per-unit price to customers who buy larger quantities

Relies on a concept known as **incentive compatibility**

- The requirement under an indirect price discrimination strategy is that the price offered to each consumer group be chosen by that group.
- Firms must be careful not to discount too steeply on large quantities or else they will cannibalize consumers from the uninterested consumer segment.

Indirect (Second-Degree) Price Discrimination (3/5)

Indirect (Second-Degree) Price Discrimination through Versioning

Versioning is a pricing strategy in which a firm offers different product options designed to attract different types of consumers.

- Common example: air travel for leisure versus business passengers

For versioning to work, the marginal cost of the products offered to different consumers need *not* be equal.

- *The only requirement:* the markup must be higher for the segment with the less elastic demand.

Indirect (Second-Degree) Price Discrimination (4/5)

Consider the car manufacturer Toyota

- The firm offers two brands—Toyota and Lexus—with similar models.
- Assume the following willingness to pay for two car models:

Table 10.1: Consumer Valuations for Camrys and ESs

	Toyota Camry	Lexus ES 350
Budget consumer	\$30,000	\$33,000
Luxury consumer	\$33,000	\$44,000

- What if Toyota charges \$28,000 for the Camry and \$38,000 for the ES 350?
 - Budget consumers will purchase the Camry and gain \$2,000 surplus per car (they would get -\$5,000 if purchase the Lexus ES).
 - Luxury consumers will purchase the ES 350 and gain \$6,000 surplus per car (they would only get \$5,000 in surplus if they buy the Camry).

This pricing scheme would be incentive compatible.

Indirect (Second-Degree) Price Discrimination (5/5)

Consider the car manufacturer Toyota

- The firm offers two brands—Toyota and Lexus—with similar models
- Assume the following willingness to pay for two car models:

Table 10.1: Consumer Valuations for Camrys and ESs

	Toyota Camry	Lexus ES 350
Budget consumer	\$30,000	\$33,000
Luxury consumer	\$33,000	\$44,000

- What if Toyota charges \$41,000 for the ES 350?
 - The budget consumers would still buy the Camry.
 - Luxury consumers now find the Camry preferable (\$5,000 versus \$3,000 consumer surplus).

Prices are NOT incentive compatible, as only Camrys would be sold.

Bundling (1/5)

Bundling is a pricing strategy in which a firm sells two or more products together at a single price.

When to Use It: Bundling

1. The firm has market power and can prevent resale.
2. The firm sells a second product, and consumers' demand for that product is *negatively correlated* with their demand for the first product.

Bundling (2/5)

Examples of Bundling

Cable and satellite television providers

- In general, there is little flexibility in choosing a menu of channels from the cable company.
- Cable companies have resisted attempts to decouple channels. Why?

Bundling (3/5)

Consider two consumers, Madison and Dakota, who are looking to subscribe to a cable service with two channels—ESPN and the truTV.

- First, consider *positively correlated* demand. (As demand for one channel increases across consumers, demand for the other increases as well.)

Table 10.2: Positively Correlated Valuations per Subscriber-Month

	ESPN	truTV	Bundle
Madison	\$9.00	\$1.00	\$10.00
Dakota	\$10.00	\$1.50	\$11.50

- Without bundling, the company can charge a maximum of \$9 for ESPN and \$1 for the History Channel, for a total of \$20 in revenue, if they want both Madison and Dakota to subscribe.
- With bundling, they can charge a maximum of \$10 for the bundle and get both customers.
- No benefit to bundling with positive correlation.

Bundling (4/5)

Now consider the same market, but with *negatively correlated* demand.

Table 10.3: Negatively Correlated Valuations per Subscriber-Month

	ESPN	truTV	Bundle
Madison	\$9.00	\$1.50	\$10.50
Dakota	\$10.00	\$1.00	\$11.00

- Once again, without bundling, the company can charge a maximum of \$9 for ESPN and \$1 for the History Channel, for a total of \$20 in revenue, if they want both Madison and Dakota to subscribe.
- However, with bundling, they can charge a maximum of \$10.50 for the bundle and keep both consumers, increasing total revenue to \$21 for the two consumers.

Bundling (5/5)

Mixed Bundling

Pure bundling is a type in which the firm offers products only as a bundle.

Alternatively, in **mixed bundling**, the firm offers consumers the choice of buying two or more products separately or as a bundle.

- Example: Value meals at fast-food restaurants

Advanced Pricing Strategies (1/6)

When to Use It: Block Pricing and Two-Part Tariffs

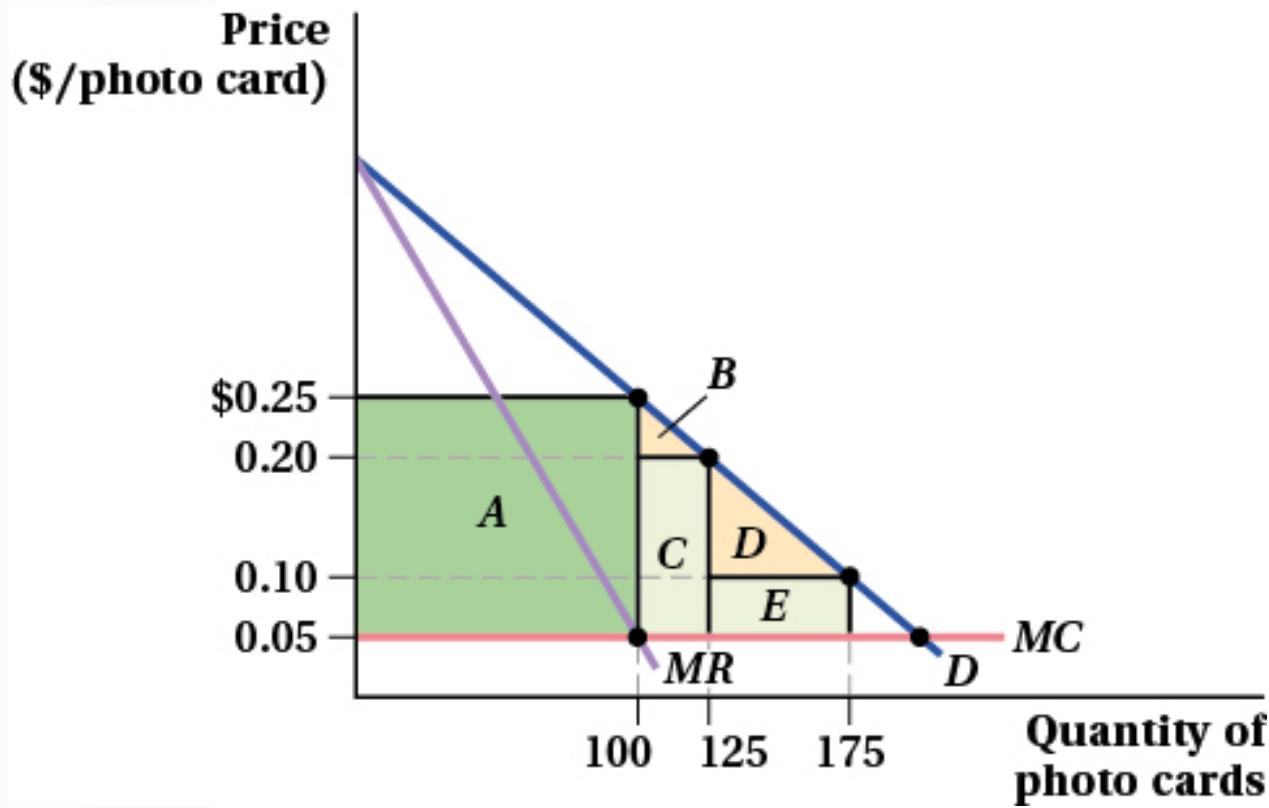
1. The firm has market power and can prevent resale.
2. The firm's customers may have either identical or different demand curves.

Block pricing is the practice of reducing the price of a good when the customer buys more of it.

- Unlike indirect price discrimination (quantity discounts), block pricing does not consider buyers' demand curves.

Advanced Pricing Strategies (2/6)

Figure 10.6 Block Pricing



Advanced Pricing Strategies (3/6)

A **two-part tariff** is a pricing strategy in which the payment has two components, a per-unit price and a fixed fee.

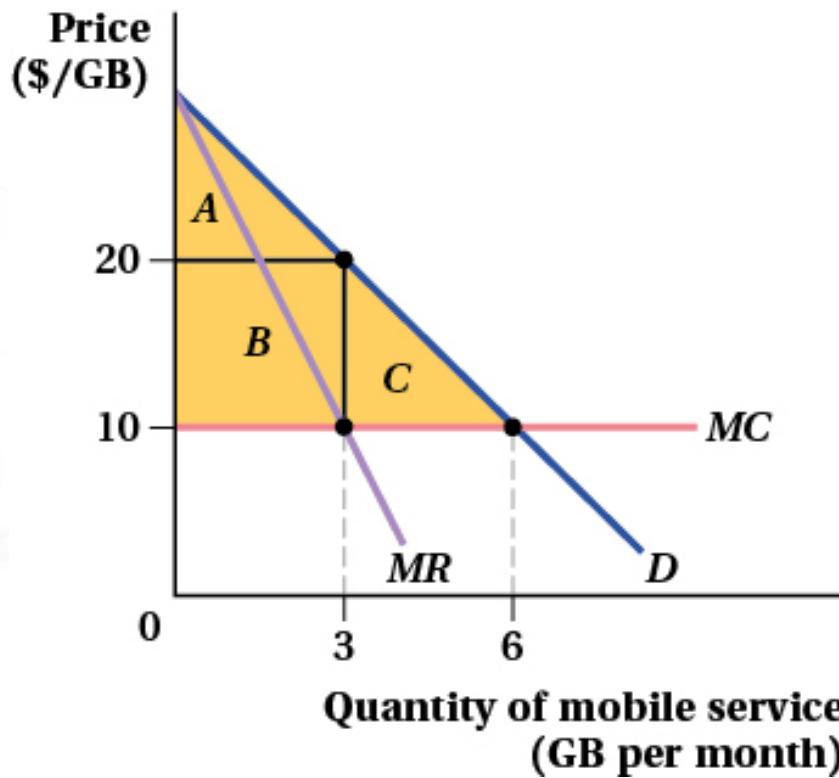
- Examples:
 - Video game systems: fixed fee (console), per-unit price (games)
 - Zipcar: fixed fee (annual membership), per-unit price (hourly rental fee)
 - Popular clubs: fixed fee (cover charge), per-unit price (beverages)
 - Amazon Prime: fixed fee (yearly charge), per-unit price (any purchases)

Advanced Pricing Strategies (4/6)

Figure 10.7 Two-Part Tariff

By adding a fixed monthly fee equal to $A + B + C$, the firm can lower the per-minute price to \$10 per GB, where $D = MC$ (the competitive outcome).

It can set a fixed fee equal to the consumer's surplus and collect the entire amount of surplus.



Advanced Pricing Strategies (5/6):

Question 1

An attorney who specializes in making living wills interviews each client beforehand to assess each client's maximum willingness to pay for a living will. The attorney then charges each client what she believes is their maximum willingness to pay. This type of pricing strategy is most closely aligned with which of these pricing strategies?

- A. Bundling
- B. Two-Part Tariffs
- C. Perfect (First-Degree) Price Discrimination
- D. Indirect (Second-Degree) Price Discrimination

Advanced Pricing Strategies (5/6): Question 1 – Correct Answer

An attorney who specializes in making living wills interviews each client beforehand to assess each client's maximum willingness to pay for a living will. The attorney then charges each client what she believes is their maximum willingness to pay. This type of pricing strategy is most closely aligned with which of these pricing strategies?

- A. Bundling
- B. Two-Part Tariffs
- C. **Perfect (First-Degree) Price Discrimination (correct answer)**
- D. Indirect (Second-Degree) Price Discrimination

Advanced Pricing Strategies (6/6):

Question 2

A health club charges a low annual membership fee for the right to use their facilities in addition to charging its members a visit fee each time they visit the club. This type of pricing strategy is most closely aligned with which of these pricing strategies?

- A. Bundling
- B. Two-Part Tariffs
- C. Perfect (First-Degree) Price Discrimination
- D. Indirect (Second-Degree) Price Discrimination

Advanced Pricing Strategies (6/6): Question 2 – Correct Answer

A health club charges a low annual membership fee for the right to use their facilities in addition to charging its members a visit fee each time they visit the club. This type of pricing strategy is most closely aligned with which of these pricing strategies?

- A. Bundling
- B. Two-Part Tariffs (correct answer)**
- C. Perfect (First-Degree) Price Discrimination
- D. Indirect (Second-Degree) Price Discrimination

Conclusion (1/1)

In this chapter, we explored how firms with market power may increase producer surplus beyond that achieved with a single price.

- None of the strategies will work if the firm does not have market power.
- The firm must always prevent resale (or market or product attributes must make resale unrealistic).
- Each strategy entails charging different consumers different prices.
- In some cases, the firm decides who to charge each price, but in others, consumers self-select, which requires *incentive compatibility*.

In the next chapter, we examine firms with degrees of market power that fall between perfect competition and monopoly:

- Oligopoly
- Monopolistic competition