

Pricing with Market Power

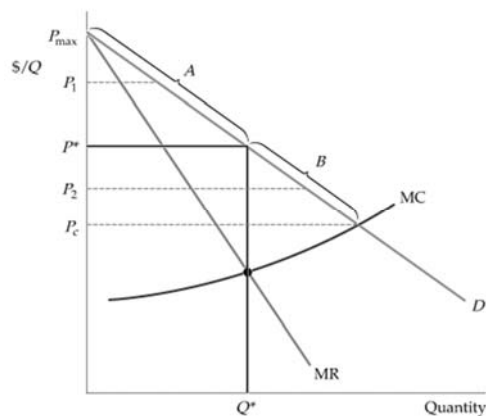
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Price discrimination

- **price discrimination** Practice of charging different prices to different consumers for similar goods.

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Capturing Consumer Surplus



If a firm can charge only one price for all its customers, that price will be P^* and the quantity produced will be Q^* . Ideally, the firm would like to charge a higher price to consumers willing to pay more than P^* , thereby capturing some of the consumer surplus under region A of the demand curve.

The firm would also like to sell to consumers willing to pay prices lower than P^* , but only if doing so does not entail lowering the price to other consumers.

In that way, the firm could also capture some of the surplus under region B of the demand curve.

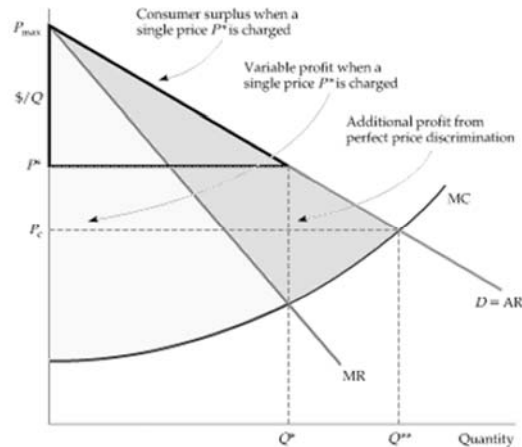
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First degree price discrimination

- **reservation price** Maximum price that a customer is willing to pay for a good.
- **first-degree price discrimination** Practice of charging each customer her reservation price.

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First degree price discrimination



Because the firm charges each consumer her reservation price, it is profitable to expand output to Q^{**} . When only a single price, P^* , is charged, the firm's variable profit is the area between the marginal revenue and marginal cost curves. With perfect price discrimination, this profit expands to the area between the demand curve and the marginal cost curve.

- **variable profit** Sum of profits on each incremental unit produced by a firm; i.e., profit ignoring fixed costs.

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First degree price discrimination

Necessary conditions: the firm must

- face a downward sloping demand or have some market power.
- be able to identify the different consumers and get them to pay different prices!
- be able to prevent the consumers who buy low prices to resell to the consumers who are charged high prices or prevent arbitrage

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Perfect Price Discrimination

The additional profit from producing and selling an incremental unit is now the difference between demand and marginal cost.

Imperfect Price Discrimination

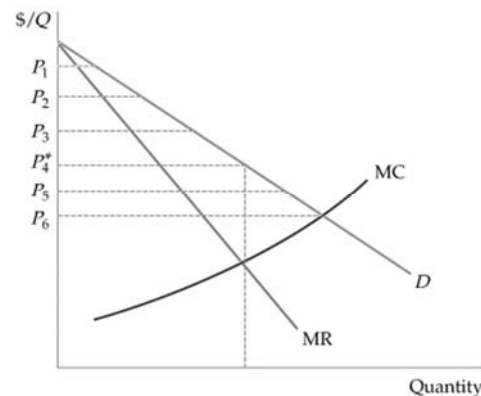
First-Degree Price Discrimination in Practice

Firms usually don't know the reservation price of every consumer, but sometimes reservation prices can be roughly identified.

Here, six different prices are charged. The firm earns higher profits, but some consumers may also benefit.

With a single price P_4^* , there are fewer consumers.

The consumers who now pay P_5 or P_6 enjoy a surplus.



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Second degree price discrimination

- **second-degree price discrimination** Practice of charging different prices per unit for different quantities of the same good or service.
- **block pricing** Practice of charging different prices for different quantities or "blocks" of a good.
- Quantity discounts are not 2-degree price discrimination: all units are charged the same. Since 2nd degree price discrimination: the first block is still high price!
Example: Buy one get another one at a half price

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Second degree price discrimination

ตารางแสดงค่าโดยสารตามระยะทาง FARE ACCORDING TO THE DISTANCE							
ระยะทาง (กม.) DISTANCE (KM.)	ค่าโดยสาร (บาท) FARE (BAHT)	ระยะทาง (กม.) DISTANCE (KM.)	ค่าโดยสาร (บาท) FARE (BAHT)	ระยะทาง (กม.) DISTANCE (KM.)	ค่าโดยสาร (บาท) FARE (BAHT)	ระยะทาง (กม.) DISTANCE (KM.)	ค่าโดยสาร (บาท) FARE (BAHT)
1.00	35	12.18	91	22.17	147	50.00	319
1.40	37	12.55	93	22.50	149	100.12	705
1.80	39	12.91	95	22.83	151	150.00	1,129
2.20	41	13.27	97	23.17	153	200.12	1,555
2.60	43	13.64	99	23.50	155	250.12	1,980
3.00	45	14.00	101	23.83	157	300.71	2,410
3.40	47	14.36	103	24.17	159	350.12	2,830
3.80	49	14.73	105	24.50	161	400.71	3,260
4.20	51	15.09	107	24.83	163	450.12	3,680
4.60	53	15.45	109	25.17	165	501.88	4,120
5.00	55	15.82	111	25.50	167	551.29	4,540
5.40	57	16.18	113	25.83	169	600.71	4,960

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Second degree price discrimination

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Third degree price discrimination

Third-degree price discrimination Practice of dividing consumers into two or more groups with separate demand curves and charging different prices to each group.

Creating Consumer Groups

If third-degree price discrimination is feasible, how should the firm decide what price to charge each group of consumers?

1. We know that however much is produced, total output should be divided between the groups of customers so that marginal revenues for each group are equal.
2. We know that *total* output must be such that the marginal revenue for each group of consumers is equal to the marginal cost of production.

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Third degree price discrimination



STUDENTS GET
10% OFF
ALL YEAR ROUND

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Third degree price discrimination

$$\pi = P_1 Q_1 + P_2 Q_2 - C(Q_T)$$

$$\frac{\Delta \pi}{\Delta Q_1} = \frac{\Delta(P_1 Q_1)}{\Delta Q_1} - \frac{\Delta C}{\Delta Q_1} = 0$$

$$MR_1 = MC$$

$$MR_2 = MC$$

$$MR_1 = MR_2 = MC$$

Determining Relative Prices

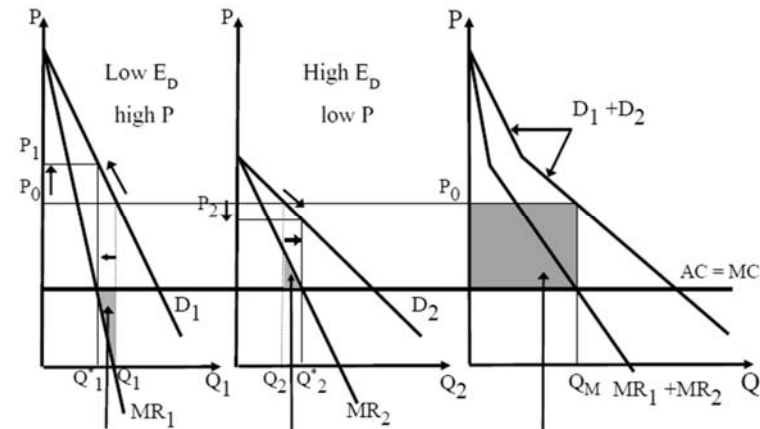
$$MR = P(1 + 1/E_d)$$

$$\frac{P_1}{P_2} = \frac{(1 + 1/E_2)}{(1 + 1/E_1)}$$

Price is higher for the market with lower E_d and price is lower for the market with higher E_d

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Third degree price discrimination



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Price discrimination: an example

EXAMPLE 11.1 The Economics of Coupons and Rebates



Coupons provide a means of price discrimination.

Studies show that only about 20 to 30 percent of all consumers regularly bother to clip, save, and use coupons.

Rebate programs work the same way.

Only those consumers with relatively price-sensitive demands bother to send in the materials and request rebates.

Again, the program is a means of price discrimination.

Price discrimination: an example

EXAMPLE 11.1 The Economics of Coupons and Rebates (continued)

TABLE 11.1 Price Elasticities of Demand for Users versus Nonusers of Coupons

Product	PRICE ELASTICITY	
	Nonusers	Users
Toilet tissue	-0.60	-0.66
Stuffing/dressing	-0.71	-0.96
Shampoo	-0.84	-1.04
Cooking/salad oil	-1.22	-1.32
Dry mix dinners	-0.88	-1.09
Cake mix	-0.21	-0.43
Cat food	-0.49	-1.13
Frozen entrees	-0.60	-0.95
Gelatin	-0.97	-1.25
Spaghetti sauce	-1.65	-1.81
Creme rinse/conditioner	-0.82	-1.12
Soups	-1.05	-1.22
Hot dogs	-0.59	-0.77

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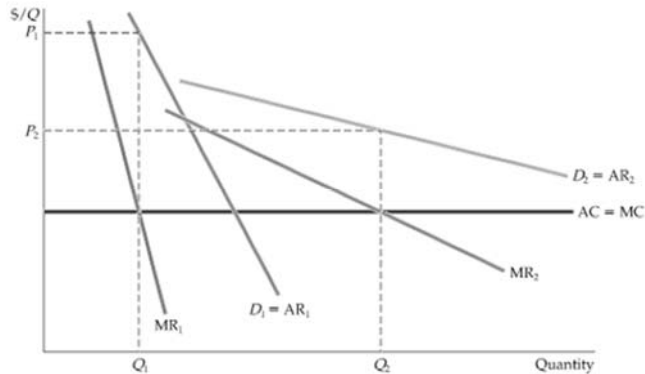
Intertemporal price discrimination

- intertemporal price discrimination** Practice of separating consumers with different demand functions into different groups by charging different prices at different points in time.

Consumers are divided into groups by changing the price over time.

Initially, the price is high. The firm captures surplus from consumers who have a high demand for the good and who are unwilling to wait to buy it.

Later the price is reduced to appeal to the mass market.



Intertemporal price discrimination

EXAMPLE 11.3

How to Price a Best-Selling Novel



Publishing both hardbound and paperback editions of a book allows publishers to price discriminate.

Some consumers want to buy a new bestseller as soon as it is released, even if the price is \$25. Other consumers, however, will wait a year until the book is available in paperback for \$10.

The key is to divide consumers into two groups, so that those who are willing to pay a high price do so and *only* those unwilling to pay a high price wait and buy the paperback.

It is clear, however, that those consumers willing to wait for the paperback edition have demands that are far more elastic than those of bibliophiles.

It is not surprising, then, that paperback editions sell for so much less than hardbacks.

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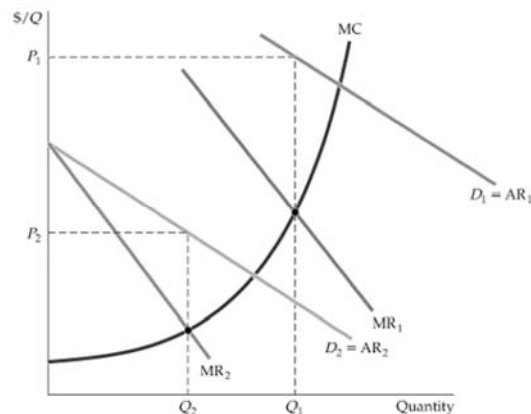
Peak load pricing

peak-load pricing Practice of charging higher prices during peak periods when capacity constraints cause marginal costs to be high.

Demands for some goods and services increase sharply during particular times of the day or year.

Charging a higher price P_1 during the peak periods is more profitable for the firm than charging a single price at all times.

It is also more efficient because marginal cost is higher during peak periods.



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Peak load pricing: examples

- Demand for some products may peak at particular times.
 - ✓ Electricity: day time \$4/unit, night time \$1/unit.
 - ✓ Rental rate for resorts during high season is higher than the off season

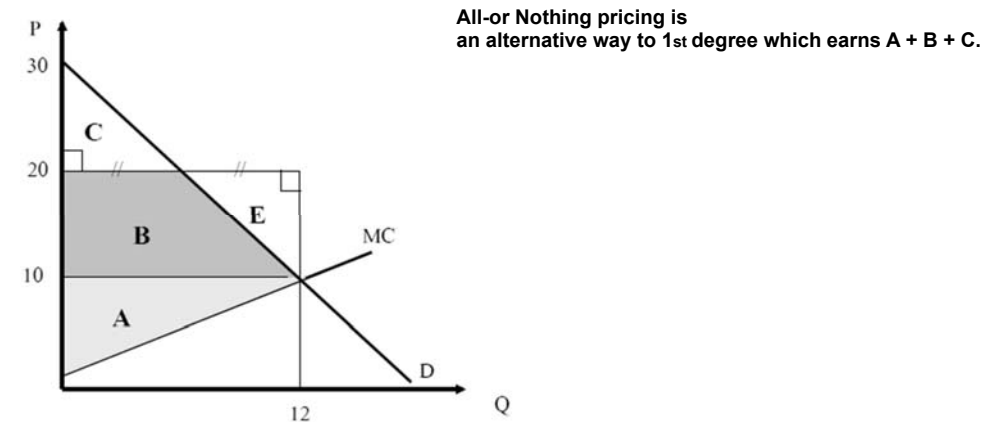
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Peak load pricing

- Objective is to increase efficiency by charging customers close to marginal cost!
 - ✓ Increased MR and MC would indicate a higher price.
- MCs differ for different time periods for peak-load pricing.
 - ✓ Price and sales in each market are independent.

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All-or-nothing pricing



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Two-part tariff

- The purpose of a two-part tariff is to extract more of the consumer surplus, by using a pricing scheme made up of two parts:
 - A fixed, one-time fee charged to each user that entitles the person to make further purchases. It may be also called entry fee, set-up charge, or enrollment fee.
 - A price per each unit purchased.

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Necessary condition for utilizing a two-part tariff

Necessary conditions to take advantage of this strategy:

1. The supplier must have market power.
2. The producer must be able to control access.

NOTE: Preferably the individual consumers have similar demand curves.

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EXAMPLE 11.5 Pricing Cellular Phone Service



Most telephone service is priced using a two-part tariff: a monthly access fee, which may include some free minutes, plus a per-minute charge for additional minutes.

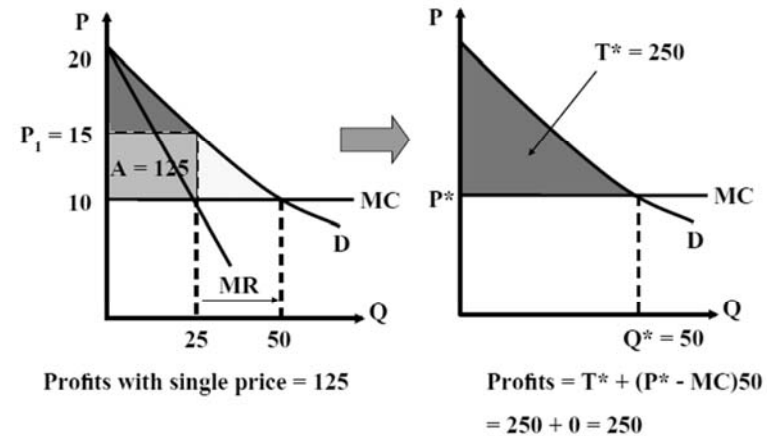
This is also true for cellular phone service, which has grown explosively, both in the United States and around the world.

Because providers have market power, they must think carefully about profit-maximizing pricing strategies.

The two-part tariff provides an ideal means by which cellular providers can capture consumer surplus and turn it into profit.

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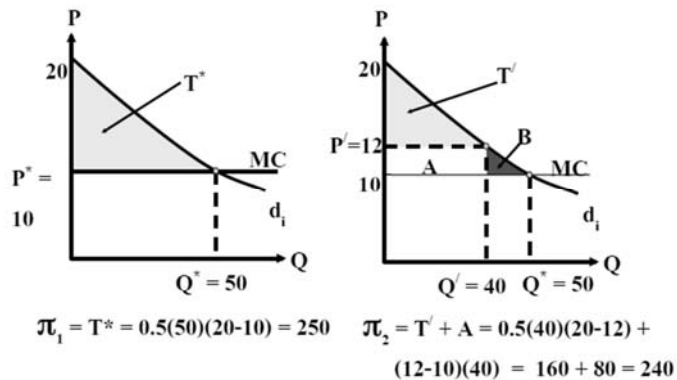
Two-part tariff: an example



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Two-part tariff with a single kind of consumer

- Assume firm knows consumer demand.
- Firm wants to capture as much consumer surplus as possible.



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Two-part tariff with two kinds of consumers

- ✓ With two kinds of consumers, firm can only set one entry fee and one usage fee.
- ✓ Firm sets entry fee equal to the consumer surplus of low-yield consumers.
- ✓ Firm will no longer set usage fee equal to MC. Firm should set usage fee above MC.

Note: Firm needs to know demand curves

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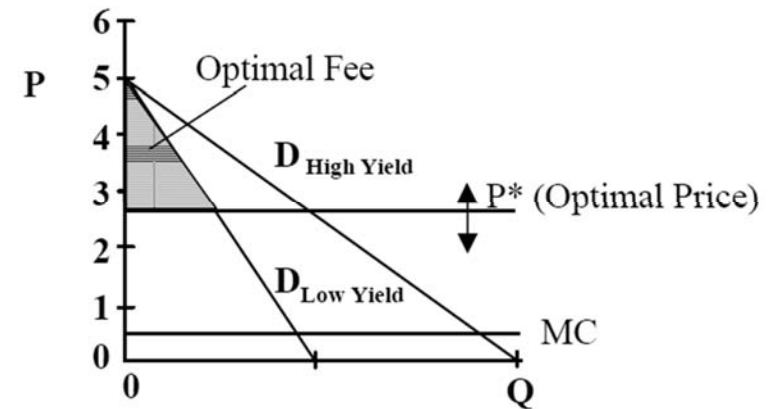
Two-part tariff with two kinds of consumers

If there are two types of consumers — and all consumers within the same group have the same demand curve — then the way to capture all the available consumer surplus is by **maximizing the profit function with respect to price**. The reason for this to be true, is that this time we do not know which of the following solutions would award us more profits:

- 1) sell only to the high-yield customers: set $P = MC$ and the fee equal to the surplus of the high-yield customers. This is identical to the one-type-of-consumer case
- 2) sell to both types of consumers: set the fee equal to the surplus of the low-yield consumers and then choose P so as to maximize total profit (including the fees); this will result in $P > MC$

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Two-part tariff with two kinds of consumers



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Using a two-part tariff with a single kind of consumers

$$TC = \$1,000 + 0.5Q$$

$$MC = \$0.50 \text{ (Q is number of drinks, costs in \$)}$$

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Using a two-part tariff with a single kind of consumers

Using a two-part tariff with two kinds of consumers

Using a two-part tariff with two kinds of consumers

BUNDLING

- **bundling** Practice of selling two or more products as a package.

To see how a film company can use customer heterogeneity to its advantage, suppose that there are two movie theaters and that their reservation prices for these two films are as follows:

	Gone with the Wind	Getting Gertie's Garter
Theater A	\$12,000	\$3000
Theater B	\$10,000	\$4000

If the films are rented separately, the maximum price that could be charged for *Wind* is \$10,000 because charging more would exclude Theater *B*. Similarly, the maximum price that could be charged for *Gertie* is \$3000.

But suppose the films are *bundled*. Theater *A* values the pair of films at \$15,000 (\$12,000 + \$3000), and Theater *B* values the pair at \$14,000 (\$10,000 + \$4000). Therefore, we can charge each theater \$14,000 for the pair of films and earn a total revenue of \$28,000.

BUNDLING

Relative Valuations

Why is bundling more profitable than selling the films separately?
Because the *relative valuations* of the two films are reversed.

The demands are *negatively correlated*—the customer willing to pay the most for *Wind* is willing to pay the least for *Gertie*.

To see why this is critical, suppose demands were *positively correlated*—that is, Theater A would pay more for *both* films:

	Gone with the Wind	Getting Gertie's Garter
Theater A	\$12,000	\$4000
Theater B	\$10,000	\$3000

If we bundled the films, the maximum price that could be charged for the package is \$13,000, yielding a total revenue of \$26,000, the same as by renting the films separately.

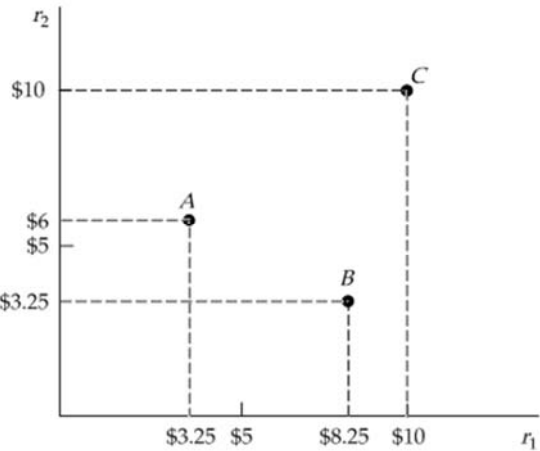
BUNDLING

Relative Valuations

Reservation Prices

Reservation prices r_1 and r_2 for two goods are shown for three consumers, labeled A, B, and C.

Consumer A is willing to pay up to \$3.25 for good 1 and up to \$6 for good 2.

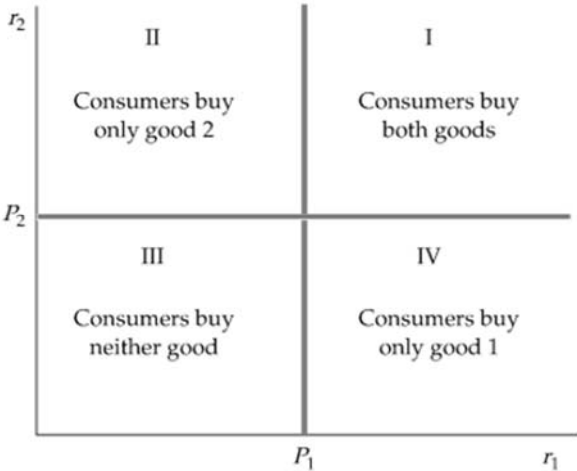


BUNDLING

Relative Valuations

Consumption Decisions When Products Are Sold Separately

The reservation prices of consumers in region I exceed the prices P_1 and P_2 for the two goods, so these consumers buy both goods. Consumers in regions II and IV buy only one of the goods, and consumers in region III buy neither good.



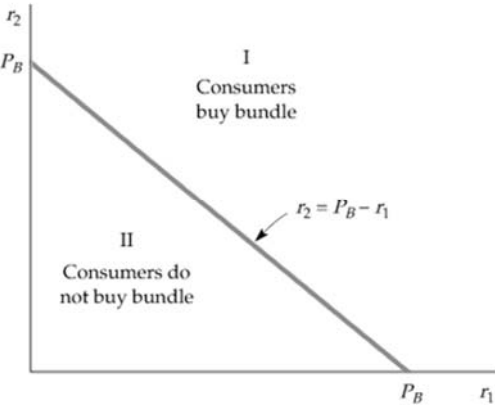
BUNDLING

Relative Valuations

Figure 11.14
Consumption Decisions When Products Are Bundled

Consumers compare the sum of their reservation prices $r_1 + r_2$, with the price of the bundle P_B .

They buy the bundle only if $r_1 + r_2$ is at least as large as P_B .



BUNDLING

Relative Valuations

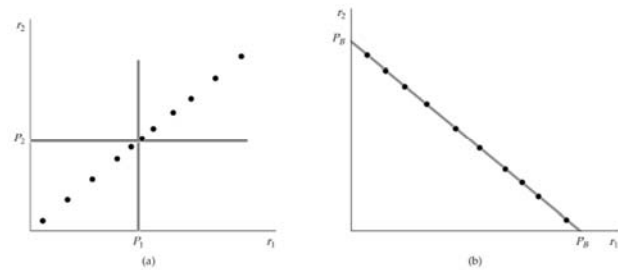


Figure 11.15

Reservation Prices

In (a), because demands are perfectly positively correlated, the firm does not gain by bundling: It would earn the same profit by selling the goods separately.

In (b), demands are perfectly negatively correlated. Bundling is the ideal strategy—all the consumer surplus can be extracted.

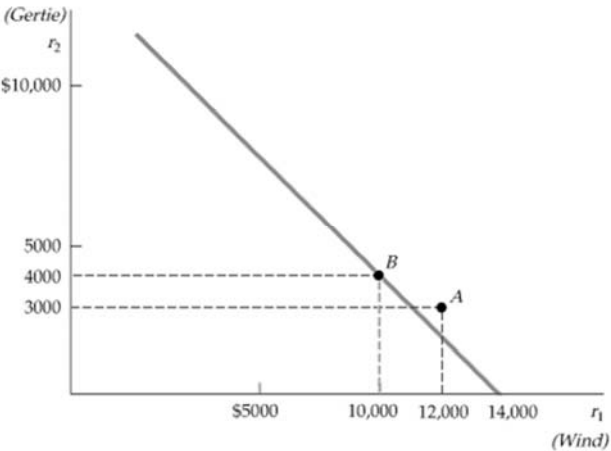
BUNDLING

Relative Valuations

Movie Example

Consumers A and B are two movie theaters. The diagram shows their reservation prices for the films *Gone with the Wind* and *Getting Gertie's Garter*.

Because the demands are negatively correlated, bundling pays.



BUNDLING

Mixed Bundling

- **mixed bundling** Selling two or more goods both as a package and individually.
- **pure bundling** Selling products only as a package.

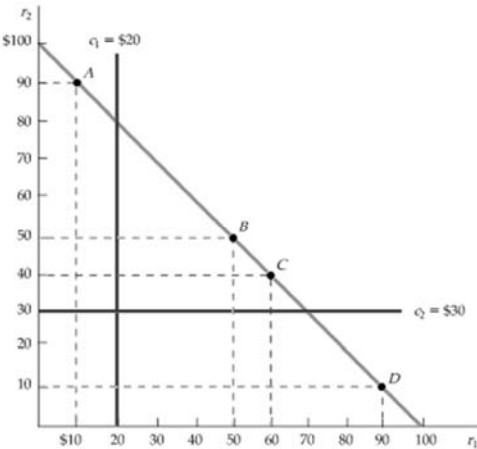
Figure 11.17

Mixed versus Pure Bundling

With positive marginal costs, mixed bundling may be more profitable than pure bundling.

Consumer A has a reservation price for good 1 that is below marginal cost c_1 , and consumer D has a reservation price for good 2 that is below marginal cost c_2 .

With mixed bundling, consumer A is induced to buy only good 2, and consumer D is induced to buy only good 1, thus reducing the firm's cost.



BUNDLING

Mixed Bundling

- Let's compare three strategies:
1. Selling the goods separately at prices $P_1 = \$50$ and $P_2 = \$90$.
 2. Selling the goods only as a bundle at a price of \$100.
 3. Mixed bundling, whereby the goods are offered separately at prices $P_1 = P_2 = \$89.95$, or as a bundle at a price of \$100.

TABLE 11.4 Bundling Example

	P_1	P_2	P_B	Profit
Sold separately	\$50	\$90	—	\$150
Pure bundling	—	—	\$100	\$200
Mixed bundling	\$89.95	\$89.95	\$100	\$229.90

BUNDLING

Mixed Bundling

Mixed Bundling with Zero Marginal Costs

If marginal costs are zero, and if consumers' demands are not perfectly negatively correlated, mixed bundling is still more profitable than pure bundling.

In this example, consumers *B* and *C* are willing to pay \$20 more for the bundle than are consumers *A* and *D*.

With pure bundling, the price of the bundle is \$100. With mixed bundling, the price of the bundle can be increased to \$120 and consumers *A* and *D* can still be charged \$90 for a single good.

TABLE 11.5 Mixed Bundling with Zero Marginal Costs

	P_1	P_2	P_B	Profit
Sell separately	\$80	\$80	—	\$320
Pure bundling	—	—	\$100	\$400
Mixed bundling	\$90	\$90	\$120	\$420

