

Lecture 12

Pricing IV:

Consumer Self Selection



15.011/0111 Economic Analysis for Business Decisions
Oz Shy

Why is market segmentation needed? (Review)

1. Just setting 2 prices (for all consumers) cannot enhance profit b/c all consumers will choose the lower price option
Example: Setting $p^H = \$2$ and $p^L = \$1$ for the same good, all consumers will choose to pay $p^L = \$1$
[thereby making the price p^H irrelevant]
2. A market segmentation strategy would
 - ‘prevent’ high willingness-to-pay consumers from selecting the lower price option
 - while allowing low willingness-to-pay consumers to select the low-price option

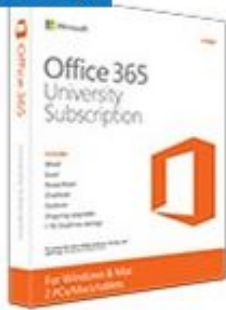
Examples to be discussed in class: Student discount, “damaged goods” (delay in delivery, removal of options), senior discount, advance purchase, economy versus business class)



Market segmentation: Information available to the seller about consumer type

Consumer type is observable

For students only



Office 365 University

- For 2 devices, including PCs, Macs, iPads, Android, or Windows tablets
- 1TB online storage for 1 user
- 60 minutes monthly Skype calls for 1 user¹
- Ongoing access to updates

Student price

\$79.99 4-year subscription

1 PC only



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- For 1 PC
- Store files in the cloud with OneDrive
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★★★★☆ 3.4 (40)

Unobservable

FedEx® Ship | Track

FedEx Portfolio of US Shipping Services

► U.S. Shipping Services Home

► Package/Envelope within the U.S.

Delivery today

Delivery first thing tomorrow

Delivery tomorrow

2 or 3 day shipping

Simple example of segmentation via menu pricing (assuming $MC_H = MC_L = 0$)

Willingness to pay by consumer type	Consumer type	High speed (HS)	Low speed (LS)
	Business	\$2,000	\$500
	Households	\$300	\$200

Suppose we set $P_L = \$200$, so households could buy LS

Class discussion: what should be the profit-maximizing price of a high-speed printer to induce business consumers to purchase it?

That is, $P_H = \$\$\$?$



Simple example of segmentation via menu pricing (con'd)

Willingness to pay by consumer type	Consumer type	High speed (HS)	Low speed (LS)
	Business	\$2,000	\$500
	Households	\$300	\$200

Suppose we set $P_L = \$200$, so households could buy LS

If businesses buy the LS, their $CS(\text{Bus.}, \text{LS}) = \$500 - \$200 = \300 , so they will NOT pay $P_H = \$2,000$ for HS !

Solution: Set $P_H = \$2,000 - \$300 = \$1,700$ (or \$1699) to include business consumers to buy the HS (instead of LS) printer

Two consumer groups: Tennis club example



To simplify today's discussion: We will be using the same two types of consumer: Serious & casual players

Q_s = # hours/week played by serious players

Q_c = # hours/week played by casual players

Assume 2,000 consumers ($k = 1,000$ players of each type)

$$Q_s = 6 - P \Leftrightarrow p = 6 - Q_s \quad Q_c = 3 - \frac{1}{2}P \Leftrightarrow p = 6 - 2Q_c$$

Club (seller's) cost structure: $MC = 0$ and $TFC = \$5000$

Information issues: (1) Seller **can** recognize each consumer type and charge different prices to different consumers
(2) Seller **cannot** recognize each type of consumer (player)

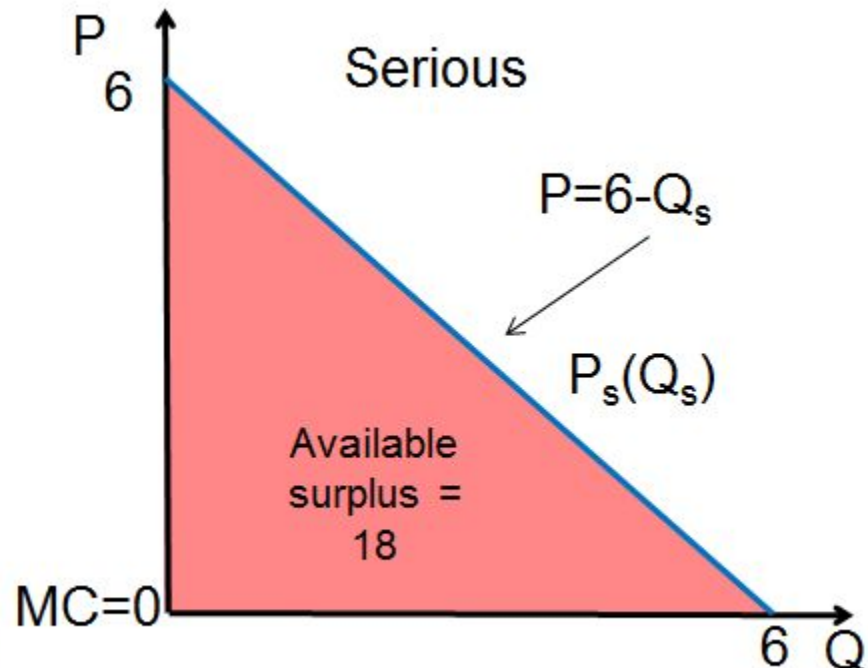
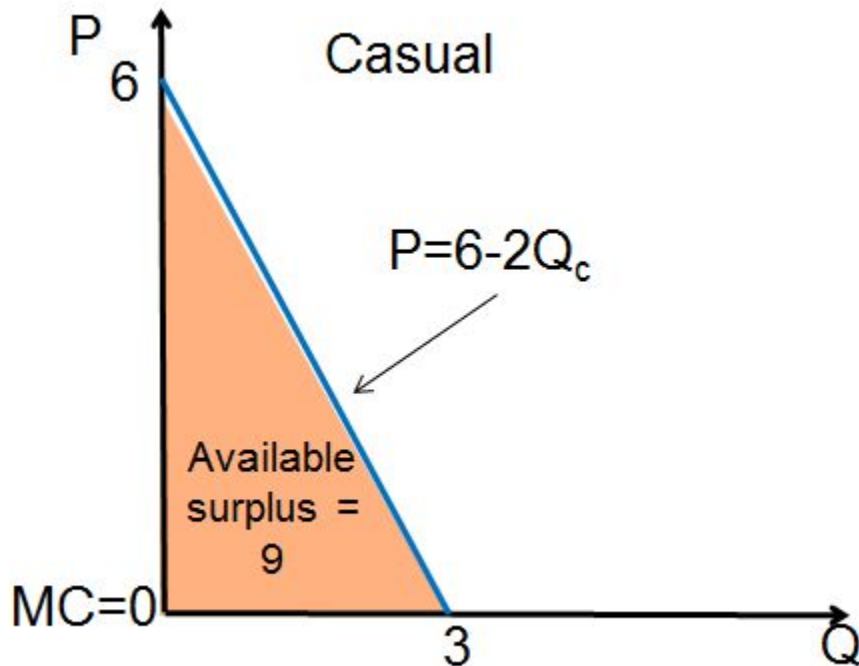
Setup 1: Seller can observe consumer type and price discriminate

Set two separate two-part tariffs:

$P =$ price-per-hour + F (membership fee/week)

Casual: $P = MC = 0$ & $F_c = \$9$; Serious: $P = MC = 0$ & $F_s = \$18$;

$$\Pi = \$9k + \$18k - \$5k = \$22k = \$22,000$$



Setup 2a: Seller cannot observe consumer type and serves serious player only (high fee)

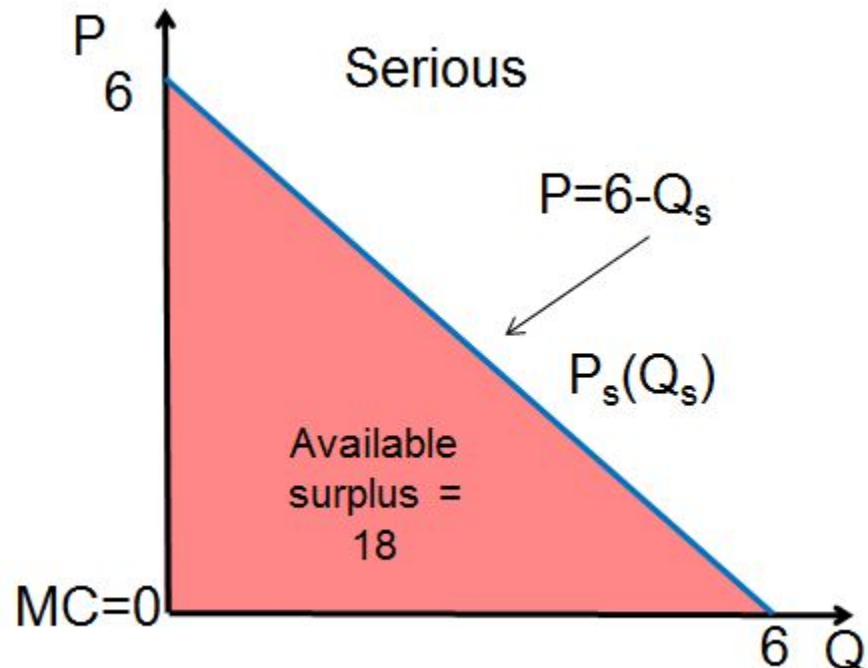
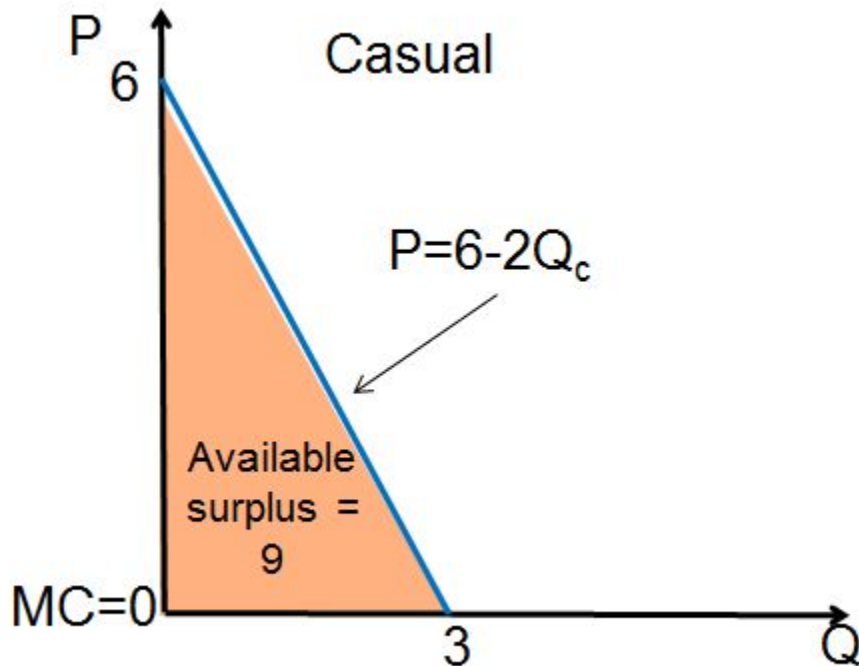
Set a **one** (high) two-part tariff:

$P =$ price-per-hour + F (membership fee)

All consumers: $P = MC = 0$ & $F = \$18$;

Casual players will not buy because $CS_c = \$9 < \$18 = F$

$$\Pi = \$18k - \$5k = \$13k = \$13,000$$



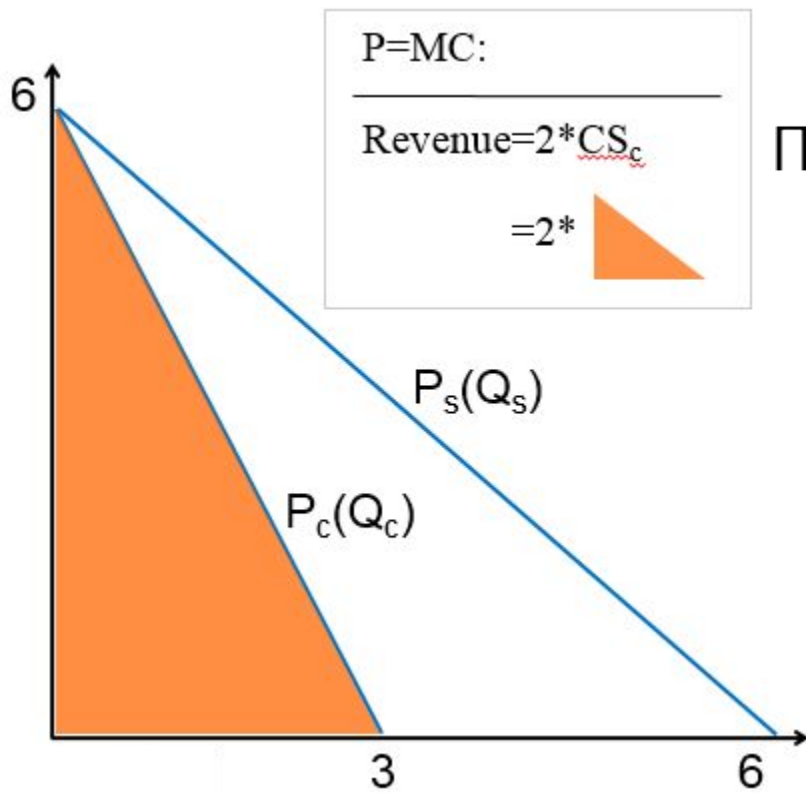
Setup 2b: Seller cannot observe consumer type and serves both player types (low fee)

Set a **one** (low) two-part tariff:

$P =$ price-per-hour + F (membership fee)

All consumers: $P = MC = 0$ & $F = \$9 = CS_c$;

Serious players will also buy because $CS_s = \$18 > \$9 = F$



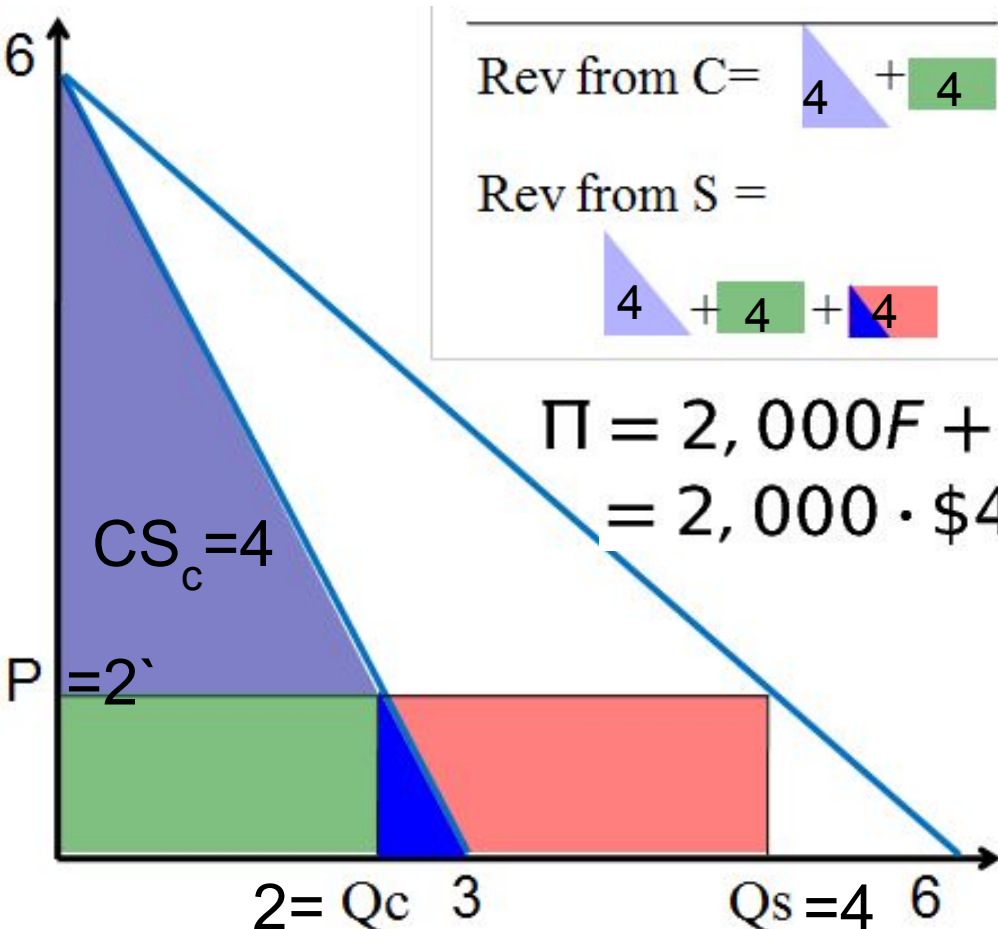
$$\Pi = 2 \cdot \$9k - \$5k = \$13k = \$13,000$$

which yields the same profit as under option 2a (previous slide)

Setup 2c: Seller cannot observe consumer type and serves both player types ($P > MC$)

Set a **one** two-part tariff (but, with $P > MC$):

Try: All consumers: $P = \$2 > MC = 0$ & $F = \$4 = CS_c$



$$\begin{aligned} \Pi &= 2,000F + 1,000P(Q_c + Q_s) - 5,000 \\ &= 2,000 \cdot \$4 + 1,000\$2(2 + 4) - 5,000 \\ &= \$15,000 > \$13,000 \end{aligned}$$

Note: Setting $P = \$1.5$ would yields $\Pi = \$15,250$

The consumer self-selection problem

But, what can the seller do if she does not distinguish among different by types (WTP)?

- Some consumers spend the entire day blaa-blaa over the phone
- Some consumers speak less than 1 minute a day
- But, the carrier (T-mobile, Verizon, AT&T) does not know which one is which
- If you ask the consumers, they will state that they have low willingness to pay (why do you want to reveal that you really like the phone and pay more?)
- The carrier's problem: Design "packages" that appeal to different groups of consumers



Hence, by selecting different packages, consumers will end up revealing their type

Consumer self-selection: Example

T-Mobile

MOST POPULAR

<p>1 GB 4G LTE DATA</p> <p>\$50 /MO. INCLUDES: UNLIMITED TALK, TEXT & DATA More Details Below ></p>	<p>3 GB 4G LTE DATA</p> <p>\$60 /MO. INCLUDES: UNLIMITED TALK, TEXT & DATA More Details Below ></p>	<p>5 GB 4G LTE DATA</p> <p>\$70 /MO. INCLUDES: UNLIMITED TALK, TEXT & DATA More Details Below ></p>	<p>UNLIMITED 4G LTE DATA* ON-SMARTPHONE ONLY</p> <p>\$80 /MO. INCLUDES: UNLIMITED TALK, TEXT & DATA More Details Below ></p>
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Individual Voice Plans (price per month)

	450 minutes	900 minutes	Unlimited
	\$40	\$60	\$70
	\$40	\$60	\$70
	\$70	\$90	\$100

Targeting low-use consumers:

Pay As You Go

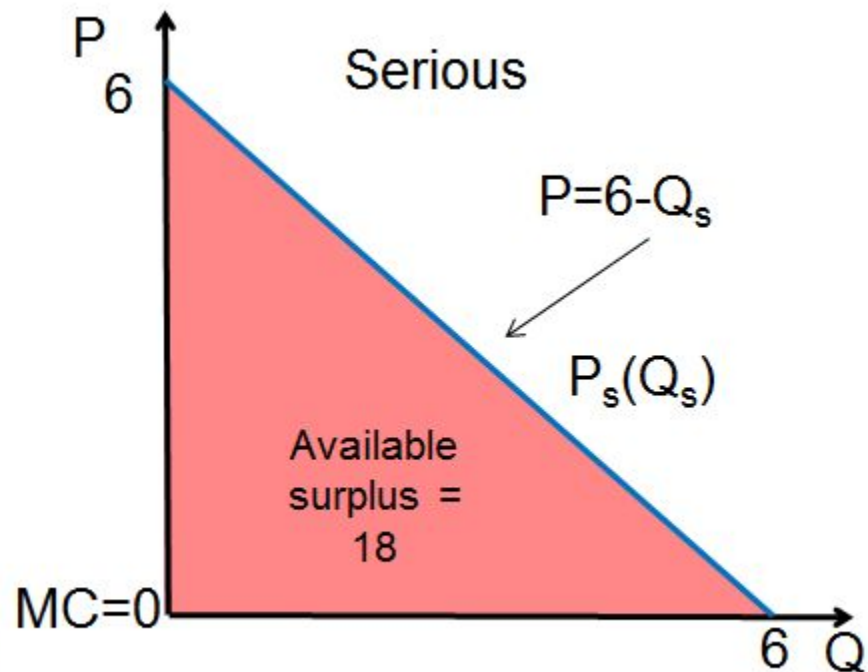
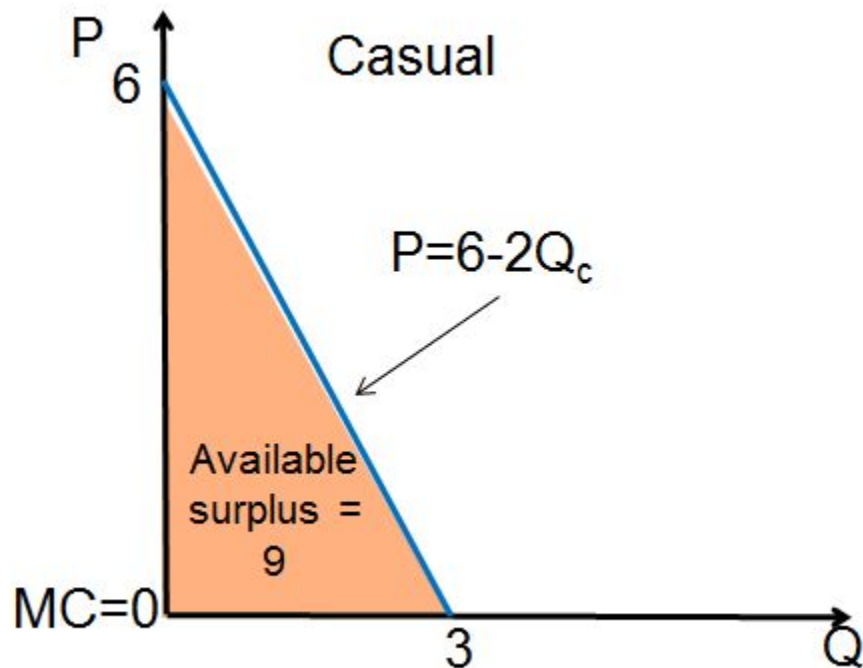
\$3 per month includes 30 minutes of two, up to 30 and lets you keep

10¢ per min | 10¢ per text

Setup 3a: Seller cannot observe consumer type and sells 2 packages (menu pricing)

In-class problem: Compute the club's profit-maximizing membership fees for two packages:

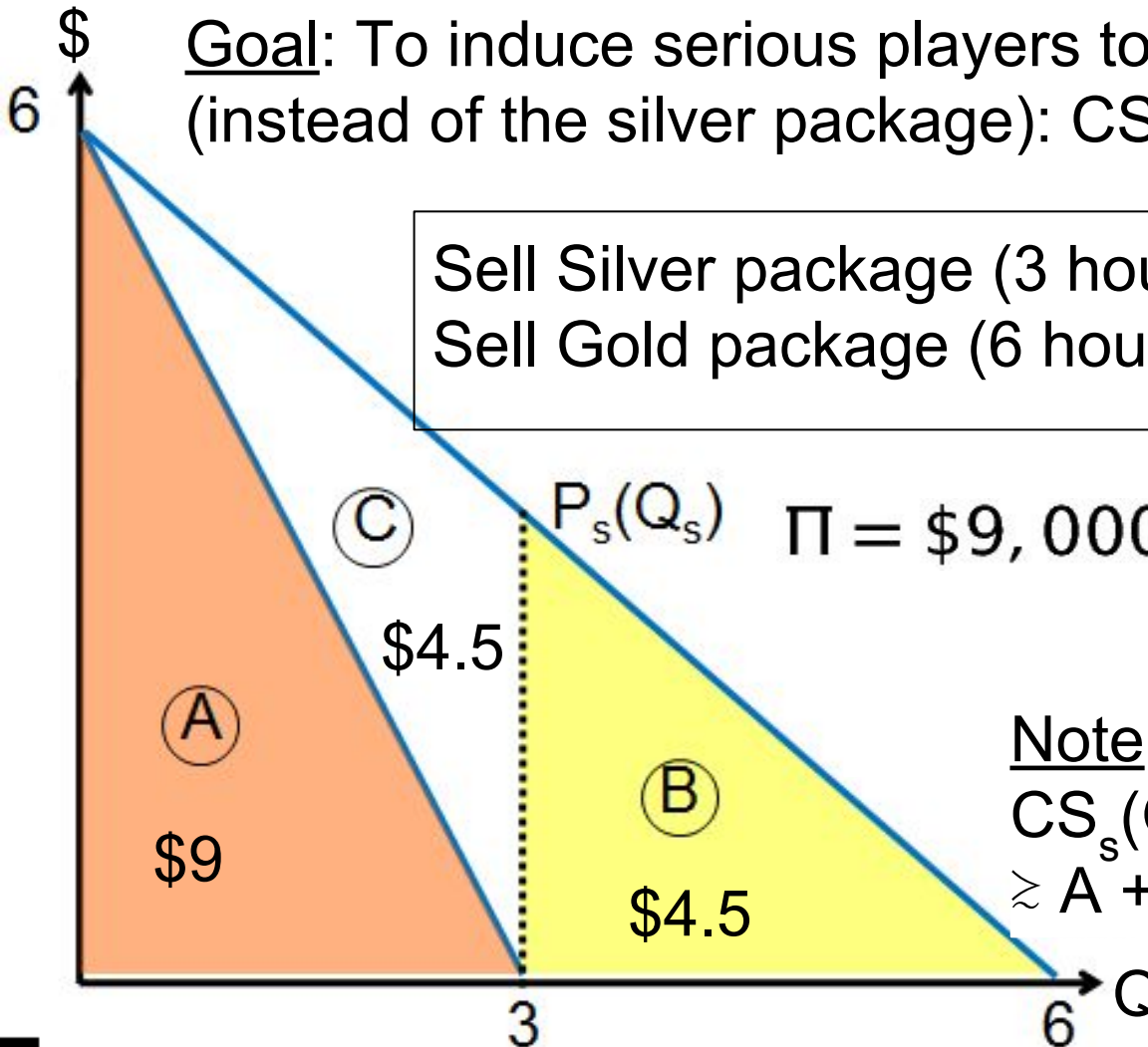
1. Gold membership: 6 hours/wk selling for $F_g = \$\$\$$
2. Silver membership: 3 hours/wk selling for $F_s = \$\$\$$



Setup 3a: Seller cannot observe consumer type and sells 2 two packages (menu pricing)

Goal: To induce serious players to buy the gold package (instead of the silver package): $CS_s(\text{Gold}) \geq CS_s(\text{Silver})$

Sell Silver package (3 hours) for $F_s = \$9 = A$
 Sell Gold package (6 hours) for $F_g = \$13.5 = A + B$



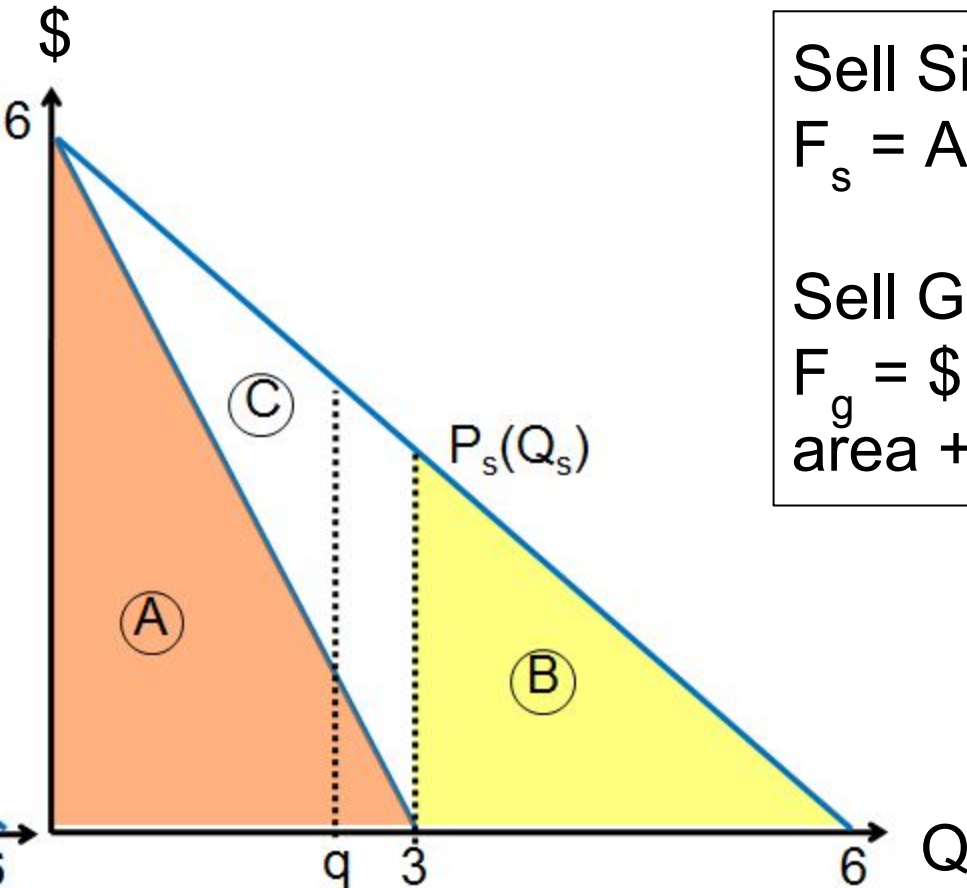
$$\Pi = \$9,000 + \$13,500 - \$5,000$$

$$\Pi = \$17,500$$

Note:
 $CS_s(\text{Gold}) = A + B + C - \13.5
 $\geq A + C - \$9 = CS_s(\text{Silver})$

Setup 3b: Seller cannot observe consumer type (“improved” menu pricing)

“Damage” the silver package a bit (offer q hours, $q < 3$)



Sell Silver package (3 hours) for
 $F_s = A - \text{reduced orange area}$

Sell Gold package (6 hours) for
 $F_g = \$13.5 = A + B - \text{reduced orange area} + \text{new white area}$

Tying products (bundling)




Selling several products “bundled” in a single basket (single price), versus selling each product separately (unbundling)

Software bundling



Internet bundling

Fios Triple Play
2-Year Agreement

 +  + 

50/50 Mbps Internet Custom TV Home Phone

Starting at **\$79⁹⁹** MO.

for 2 yrs. plus taxes, equip. charges, FDV & other fees with 2-yr. agmt.
[Offer & Pricing Details](#)

Tying products (bundling) assuming $MC=0$

Consumer type (I and II)	Spreadsheet (good A)	Word processor (good B)
I (max willingness to pay)	\$8	\$3
II (max willingness to pay)	\$2	\$8

No tying (no bundling): Selling A and B as separate products.
Profit-maximizing prices are $P_A = P_B = \$8$. Profit = \$16

Note: Consumer I buys good A only. Consumer II buys B only

Tying (bundling): Sell only a package (bundle
containing A & B for $P = \$10$. Profit = \$20