Lecture 7
Pricing with Market Power
Introduction

Once firms face a downward sloping demand curve they have the ability to affect market price.

Up to now we have been assuming that a firm can only charge the same price for all units of the good.
Introduction

- Firms could potentially make more money if they could charge a different price for each unit of the good sold.
- Turns out that firms can, and sometimes do, charge different prices to different consumers or for different units of the good.
Charging different prices for different units of the good or to different consumers is called **price discrimination**.

- Requires more information about customers

Pricing in this manner moves us closer to the efficient outcome.

Continue to primarily focus on single period models.
Topics to be Discussed

- Capturing consumer surplus
- Price discrimination
- Coupons and bundling
- Intertemporal price discrimination and peak-load pricing
Capturing Consumer Surplus

- What the firm would like to do is capture as much of the consumer surplus as possible and turn it into producer surplus.
Price discrimination is the charging of different prices to different consumers for similar goods.

– Also can be selling different units of the same good at a different price.

What are some examples?
Without price discrimination, output is $Q^*$ and price is $P^*$. Variable profit is the area between the MC & MR (orange).

Consumer surplus is the area above $P^*$ and between 0 and $Q^*$ output.

With perfect discrimination, each consumer pays the maximum price they are willing to pay.

Output expands to $Q^{**}$ and price falls to $P_C$ where $MC = MR = AR = D$. Profits increase by the area above $MC$ between old $MR$ and $D$ to output $Q^{**}$ (purple).
First Degree Price Discrimination

- Requires information about each consumers reservation price
  • Relatively rare
  • Universities do some of this
- The internet allows firms to obtain more information about an individual consumer’s demand and charge individual prices
Second-Degree Price Discrimination (Block Pricing)

- In some markets where consumers buy multiple units of a good, their demand may vary with the number of units consumed.
- In this market it may pay for the firm to charge different prices for different numbers of units purchased.
Second-Degree Price Discrimination (Block or Menu Pricing)

- Example—Beer
  - One price for a bottle
  - Lower price for a six pack.
  - Lower price if you buy 12 beers together.
  - Even lower price if you buy 24 beers together.

- Frequently occurs for goods in which there are economies of scale in production.
Second-Degree Price Discrimination (Block Pricing)

Without discrimination: $P = P_0$ and $Q = Q_0$. With second-degree discrimination there are three prices $P_1$, $P_2$, and $P_3$. (e.g. mobile phone plans)

Second-degree price discrimination is pricing according to quantity consumed--or in blocks.
The Two-Part Tariff

Examples

1) Amusement Park
   • Pay to enter
   • Pay for rides and food within the park

2) Country Club
   • Pay to join
   • Pay to play
The Two-Part Tariff

Examples

3) Site License for Software
   • University pays flat fee
   • Pays for every copy installed

4) Telephone service providers
The Two-Part Tariff

- Pricing decision is setting the entry fee \((T)\) and the usage fee \((P)\).

- Choosing the trade-off between free-entry and high use prices or high-entry and zero use prices.
Two-Part Tariff with a Single Consumer

Usage price $P^*$ is set where $MC = D$. Entry price $T^*$ is equal to the entire consumer surplus.
Price Discrimination

- Third Degree Price Discrimination

1) Divide the market into at least two-groups.

2) Each group has its own demand function.
Price Discrimination

➢ Third Degree Price Discrimination

3) Most common type of price discrimination

• Examples: airlines, discounts to students and senior citizens, rapid transit peak vs. off-peak fares, first run movies vs. older movies
Price Discrimination

Third Degree Price Discrimination

4) Feasible when the seller can separate the market into groups who have different price elasticities of demand (e.g. business air travelers versus vacation air travelers)
Price Discrimination

- Third Degree Price Discrimination
  - Pricing: Charge higher price to group with a low demand elasticity
Consumers are divided into two groups, with separate demand curves for each group.

\[ MR_T = MR_1 + MR_2 \]
Third-Degree Price Discrimination

\[ D_2 = AR_2 \]

\[ D_1 = AR_1 \]

\[ P_1Q_1 \] more inelastic

\[ P_2Q_2 \] more elastic

\[ MR_1 = MR_2 = MC \]

\[ MC \text{ depends on } Q_T \]

\[ Q_T: MC = MR_T \]
Price Discrimination

- Third Degree Price Discrimination
  - Determining relative prices

Recall: \( MR = P \left( 1 + \frac{1}{E_d} \right) \)

Then: \( MR_1 = P_1 \left( 1 + \frac{1}{E_1} \right) = MR_2 = P_2 \left( 1 + \frac{1}{E_2} \right) \)

And: \( \frac{P_1}{P_2} = \frac{\left( 1 + \frac{1}{E_2} \right)}{\left( 1 + \frac{1}{E_1} \right)} \)
Airline Fares

- Differences in elasticities imply that some customers will pay a higher fare than others.
- Business travelers have few choices and their demand is less elastic.
- Casual travelers have choices and are more price sensitive.
### Elasticities of Demand for Air Travel

<table>
<thead>
<tr>
<th>Elasticity</th>
<th>First-Class</th>
<th>Unrestricted Coach</th>
<th>Discount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>-0.3</td>
<td>-0.4</td>
<td>-0.9</td>
</tr>
<tr>
<td>Income</td>
<td>1.2</td>
<td>1.2</td>
<td>1.8</td>
</tr>
</tbody>
</table>
The airlines separate the market by setting various restrictions on the tickets.

- Less expensive: notice, stay over the weekend, no refund
- Most expensive: no restrictions
Third-Degree Price Discrimination

➢ Four necessary conditions for third-degree price discrimination.

1. The seller must posses some market power (face a downward sloping demand curve).

2. The seller must be able to divide the market into 2 or more identifiable groups.
   • Sometimes the seller gets the customers to identify themselves.
Third-Degree Price Discrimination

3. The elasticity of demand must differ between the groups.

4. The seller must be able to prevent the resale of the product between the groups.
The Economics of Coupons and Rebates

Price Discrimination

- Those consumers who are more price elastic will tend to use the coupon/rebate more often when they purchase the product than those consumers with a less elastic demand.

- Coupons and rebate programs allow firms to price discriminate.
Price Elasticities of Demand for Users Versus Nonusers of Coupons

<table>
<thead>
<tr>
<th>Product</th>
<th>Nonusers</th>
<th>Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat food</td>
<td>-0.49</td>
<td>-1.13</td>
</tr>
<tr>
<td>Frozen entrée</td>
<td>-0.60</td>
<td>-0.95</td>
</tr>
<tr>
<td>Gelatin</td>
<td>-0.97</td>
<td>-1.25</td>
</tr>
<tr>
<td>Spaghetti sauce</td>
<td>-1.65</td>
<td>-1.81</td>
</tr>
<tr>
<td>Crème rinse/conditioner</td>
<td>-0.82</td>
<td>-1.12</td>
</tr>
<tr>
<td>Soup</td>
<td>-1.05</td>
<td>-1.22</td>
</tr>
<tr>
<td>Hot dogs</td>
<td>-0.59</td>
<td>-0.77</td>
</tr>
</tbody>
</table>
Intertemporal Price Discrimination and Peak-Load Pricing

Separating the Market With Time

- Initial release of a product, the demand is inelastic
  - Book
  - Movie
  - Computer
  - Cell phone
Intertemporal Price Discrimination and Peak-Load Pricing

Separating the Market With Time

- Once this market has yielded a maximum profit, firms lower the price to appeal to a general market with a more elastic demand
  - Paper back books
  - Dollar Movies
  - Discount computers
Intertemporal Price Discrimination

Consumers are divided into groups over time. Initially, demand is less elastic resulting in a price of $P_1$. Over time, demand becomes more elastic and price is reduced to appeal to the mass market.

$AC = MC$

$D_2 = AR_2$

$D_1 = AR_1$

$MR_1$

$MR_2$

$P_1$

$P_2$

$Q_1$

$Q_2$

$/Q$

Quantity
Demand for some products may peak at particular times.

- Rush hour traffic
- Electricity - late summer afternoons
- Ski resorts on weekends
- Airline flights on Monday mornings and Friday evenings
Intertemporal Price Discrimination and Peak-Load Pricing

Peak-Load Pricing

- Capacity constraints will also increase MC.
- Increased MR and MC would indicate a higher price.
MR is not equal for each market because one market does not impact the other market.
Peak-Load Pricing

\[
\text{Peak-load price} = P_1.
\]

\[
\text{Off- load price} = P_2.
\]
Bundling

- Bundling is packaging two or more products to gain a pricing advantage.

- Conditions necessary for bundling
  - Heterogeneous customers
  - Price discrimination is not possible
  - Demands must be negatively correlated
Bundling

An example: Leasing “Gone with the Wind” & “Getting Gertie’s Garter.”
- The reservation prices for each theater and movie are:

<table>
<thead>
<tr>
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<th>Getting Gertie’s Garter</th>
</tr>
</thead>
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<tr>
<td>Theater A</td>
<td>$12,000</td>
<td>$3,000</td>
</tr>
<tr>
<td>Theater B</td>
<td>$10,000</td>
<td>$4,000</td>
</tr>
</tbody>
</table>
Bundling

Renting the movies separately would result in each theater paying the lowest reservation price for each movie:
- Maximum price Wind = $10,000
- Maximum price Gertie = $3,000

Total Revenue = $26,000
Bundling

If the movies are bundled:
- Theater A will pay $15,000 for both
- Theater B will pay $14,000 for both

If each were charged the lower of the two prices, total revenue will be $28,000.
Bundling

Relative Valuations

- **Negative Correlated: Profitable to Bundle**
  - A pays more for *Wind* ($12,000) than B ($10,000).
  - B pays more for *Gertie* ($4,000) than A ($3,000).
Bundling

Relative Valuations

- If the demands were positively correlated (Theater $A$ would pay more for both films as shown) bundling would not result in an increase in revenue.

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Bundling

- If the movies are bundled:
  - Theater A will pay $16,000 for both
  - Theater B will pay $13,000 for both

- If each were charged the lower of the two prices, total revenue will be $26,000, the same as by selling the films separately.
The effectiveness of bundling depends upon the degree of negative correlation between the two demands.
Bundling

- Mixed Bundling
  - Selling both as a bundle and separately
- Pure Bundling
  - Selling only a package

Mixed bundling can be optimal when some consumers place a high value on one of the products, and value the other at a price less than the marginal cost of production
Summary

- Firms with market power are in an enviable position because they have the potential to earn large profits, but realizing that potential may depend critically on the firm’s pricing strategy.

- A pricing strategy aims to enlarge the customer base and capture as much consumer surplus as possible.
Summary

- Ideally, the firm would like to perfectly price discriminate.
- The two-part tariff is another means of capturing consumer surplus.
- When demands are heterogeneous and negatively correlated, bundling can increase profits.
Bundling is a special case of tying, a requirement that products be bought or sold in some combination.