

UWTSD MBA (Nov 2018 intake)
SBMA7133 Managerial Economics

(4-2)

Pricing Strategies for Firms
with Market Power

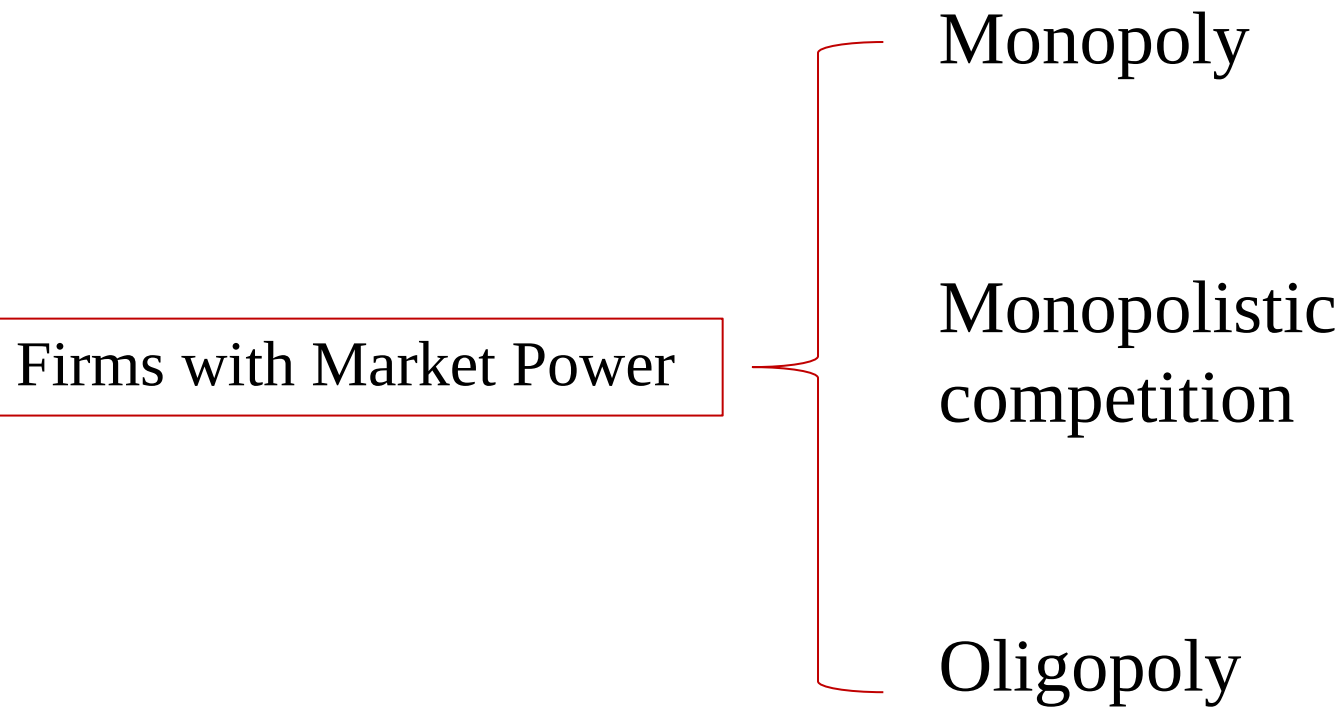
Che-Cheong POON
3 February 2019; 2:30 pm to 6:00 pm

Lecture Agenda :

- Introduction
- Pricing Strategies for New Products
- Pricing Strategies for Extracting Surplus from Consumers
- Auctions

Introduction

Firms with Market Power



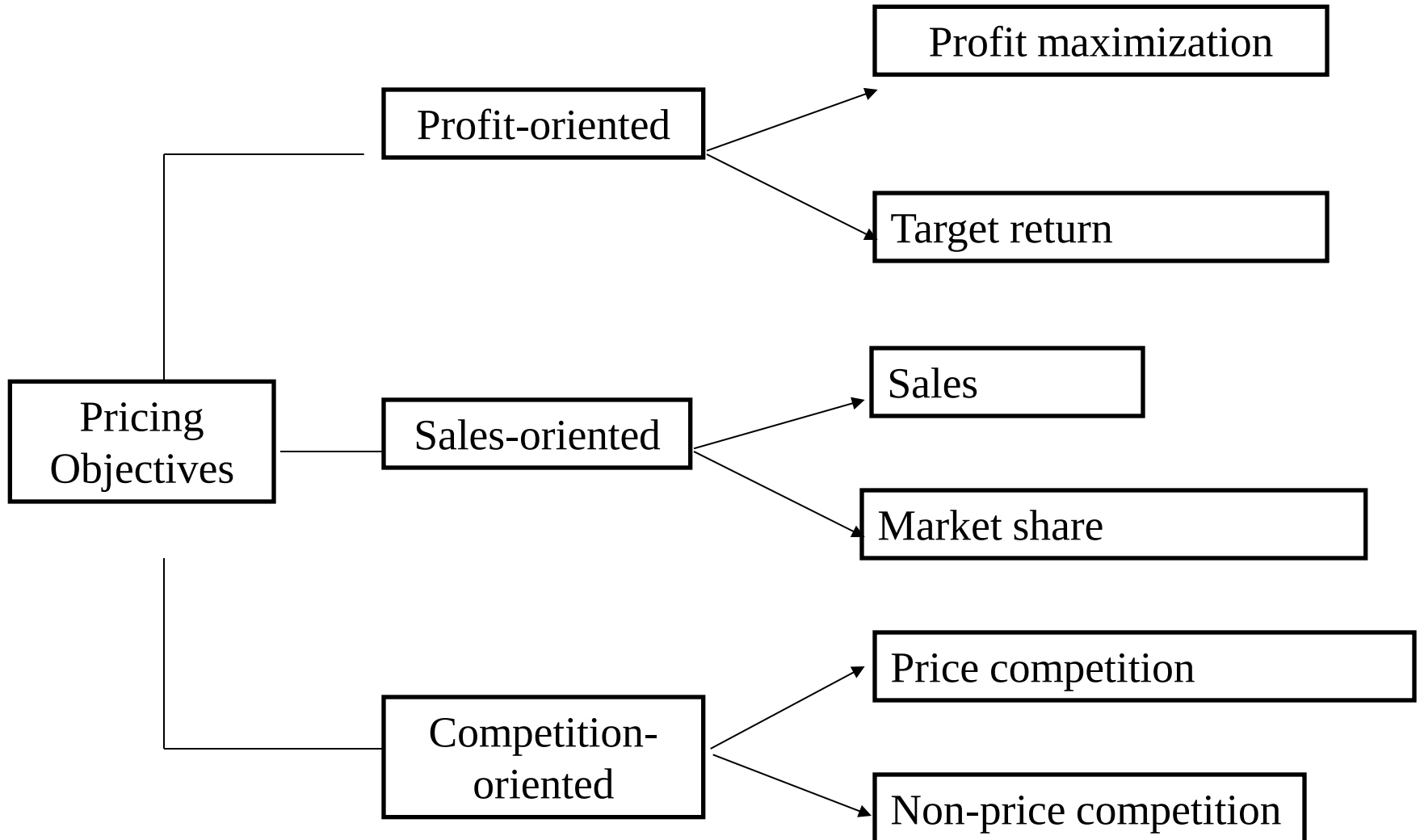
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graph LR; A[Firms with Market Power] --- B[Monopoly]; A --- C[Monopolistic competition]; A --- D[Oligopoly];
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Monopoly

Monopolistic
competition

Oligopoly

Pricing Objectives



Factors affecting pricing decision

- Product/service costs
- Market factors
- Sales volume
- Competitors' prices
- Competitive advantage
- Sensitivity
- Product image
- Economic conditions
- Business location
- Seasonal fluctuations
- Psychological factors
- Credit terms/purchase discounts
- Customers' price
- Government interference

Purchase decision of Consumer

Purchase decision

What to Buy?

From Whom to Buy?

When to Buy?

How many to Buy?

Spend how much to Buy?

All the above decisions are largely determined by the price (value) of the product

Price-adjustment strategies

Discount & allowance reducing prices to reward customer responses such as paying early or promoting the product.

Cash Discount

Quantity Discount

Functional Discount

Seasonal Discount

Trade-In Allowance

Segmented adjusting prices to allow for differences in customers, products, or locations.

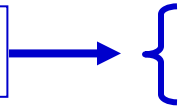
Customer

Product Form

Location

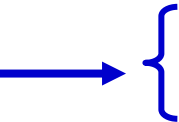
Time

Psychological Pricing



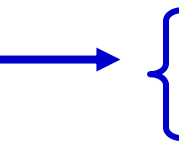
- Adjusting prices for psychological effect
- Price used as a quality indicator

Promotional Pricing



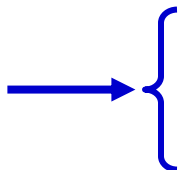
- Temporarily reducing prices to increase short run sales
- often involves reducing prices to unsustainably low levels

Geographical Pricing



- Adjusting prices to account for the geographic location of customers.
- It is intended to reflect the costs of shipping to different locations.

International Pricing



- Adjusting prices for international markets.
- Price depends on costs, consumers, economic conditions & other factors.

Pricing Strategies for New Products













New Product Pricing Strategies

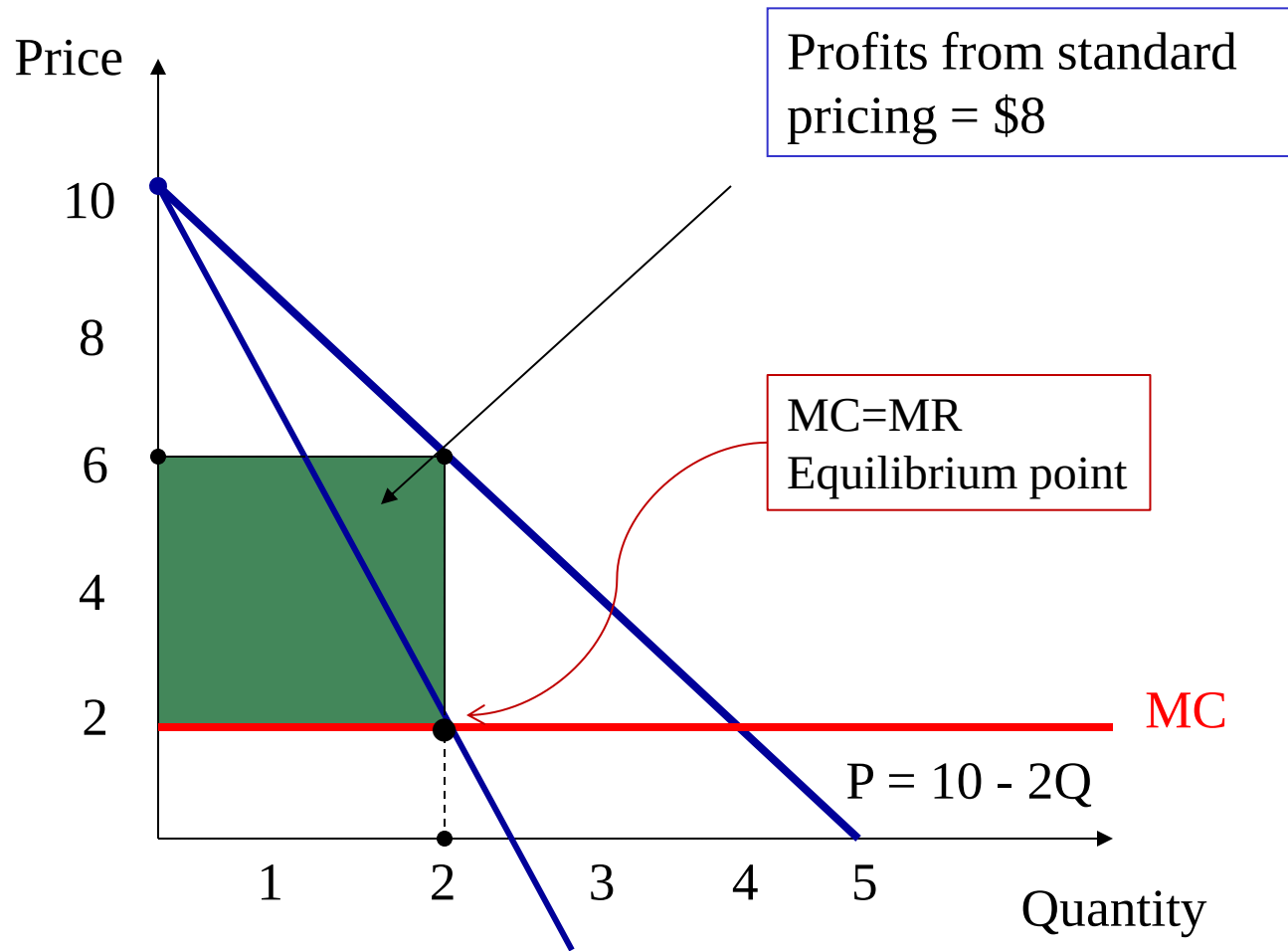
Market skimming pricing

- Setting a High Price for a new product to maximize revenues from the target Market.
- Results in fewer, more profitable Sales.

Market penetration pricing

- Setting a Low Price for a new product in order to attract a large number of buyers.
- Results in a larger market share.

Standard Pricing and Profits for Firms with Market Power



Assuming there is no fixed costs.

$$MR = 10 - 4Q$$

The price markup factor

- The firm's profit = $(P - MC)Q$
- Suppose the demand elasticity of the firm's product is $-\epsilon_d$.
- Since $MR = p \left[1 - \frac{1}{|\epsilon_d|} \right]$
- Setting $MR = MC$ and simplifying yields the following simple pricing formula:

$$P = \underbrace{[|\epsilon_d| / (|\epsilon_d| - 1)]}_{\text{The price markup factor}} \cdot MC$$

The price markup factor

$ \epsilon_d > 1$	$P = [\epsilon_d / (\epsilon_d - 1)] \cdot MC$
1.5	$P = [1.5 / (1.5 - 1)] MC = 3 MC$
2	$P = [2 / (2 - 1)] MC = 2 MC$
3	$P = [3 / (3 - 1)] MC = 1.5 MC$
5	$P = [5 / (5 - 1)] MC = 1.25 MC$
$\rightarrow \infty$	$P = MC$

A perfectly competitive firm

- The optimal price is a simple markup over relevant costs:
 - When the demand is more elastic, the markup price will be lower.
 - the less elastic the demand, the higher the markup price.

$$\begin{aligned}
 MR &= \frac{d}{dQ} TR = \frac{d}{dQ} (P \times Q) = P \cdot \frac{d}{dQ} Q + Q \cdot \frac{d}{dQ} P = P + Q \cdot \frac{dP}{dQ} = P \left(1 + \frac{Q}{P} \cdot \frac{dP}{dQ} \right) = P \left(1 + \frac{1}{\frac{P}{Q} \cdot \frac{dQ}{dP}} \right) \\
 &= P \left(1 + \frac{1}{\varepsilon_{\frac{Q_d}{P}}} \right) = P \left(1 + \frac{1}{-|\varepsilon_d|} \right) = P \left(1 - \frac{1}{|\varepsilon_d|} \right) \\
 &= P \left(\frac{|\varepsilon_d| - 1}{|\varepsilon_d|} \right)
 \end{aligned}$$

Pricing Strategies for Retailers

- Markup refers to the difference between cost of a product and its selling price.

Dollar Markup = Retail Price – Cost

% Retail Markup = Dollar Markup/Retail Price

% Cost Markup = Dollar Markup/Cost

- Follow-the-Leader
- Below-Market Pricing

Pricing Strategies for Extracting Surplus from Consumers

1. Price Discrimination
2. Two-Part Pricing
3. (Block Pricing)
4. Commodity Bundling

(1) Price Discrimination

Price discrimination is a pricing strategy that charges customers different prices for the same product or service in order to maximize sales, but the price difference cannot be explained by cost differences.

The three basic forms
of price discrimination:



First degree price discrimination

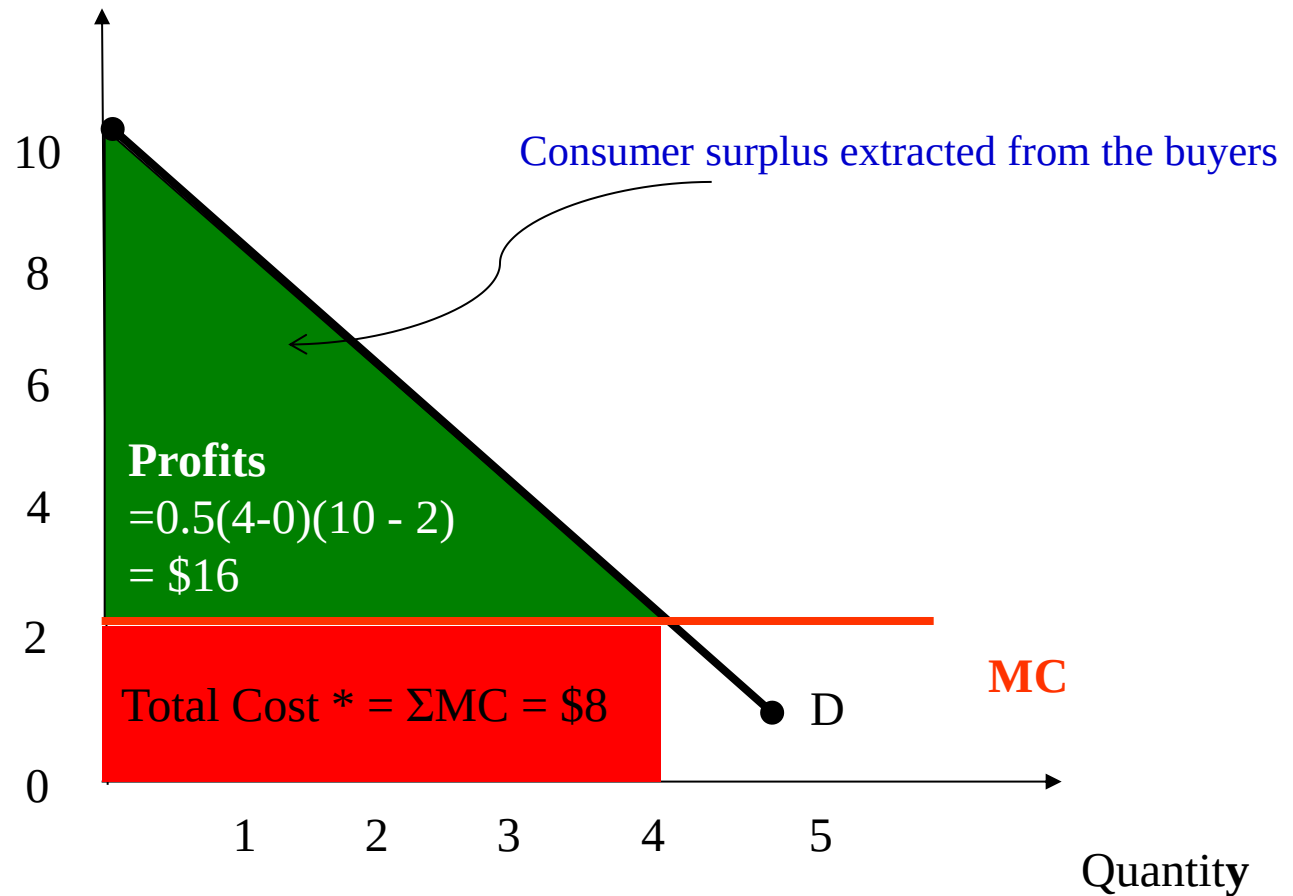
Second degree price discrimination

Third degree price discrimination

First-degree or perfect price discrimination

- The seller charges a different price for each unit, so that the price of each unit equals maximum willingness to pay.
- It is a practice of charging each consumer the maximum amount he or she will pay for each incremental unit.
- Permits a firm to extract all surplus from consumers.

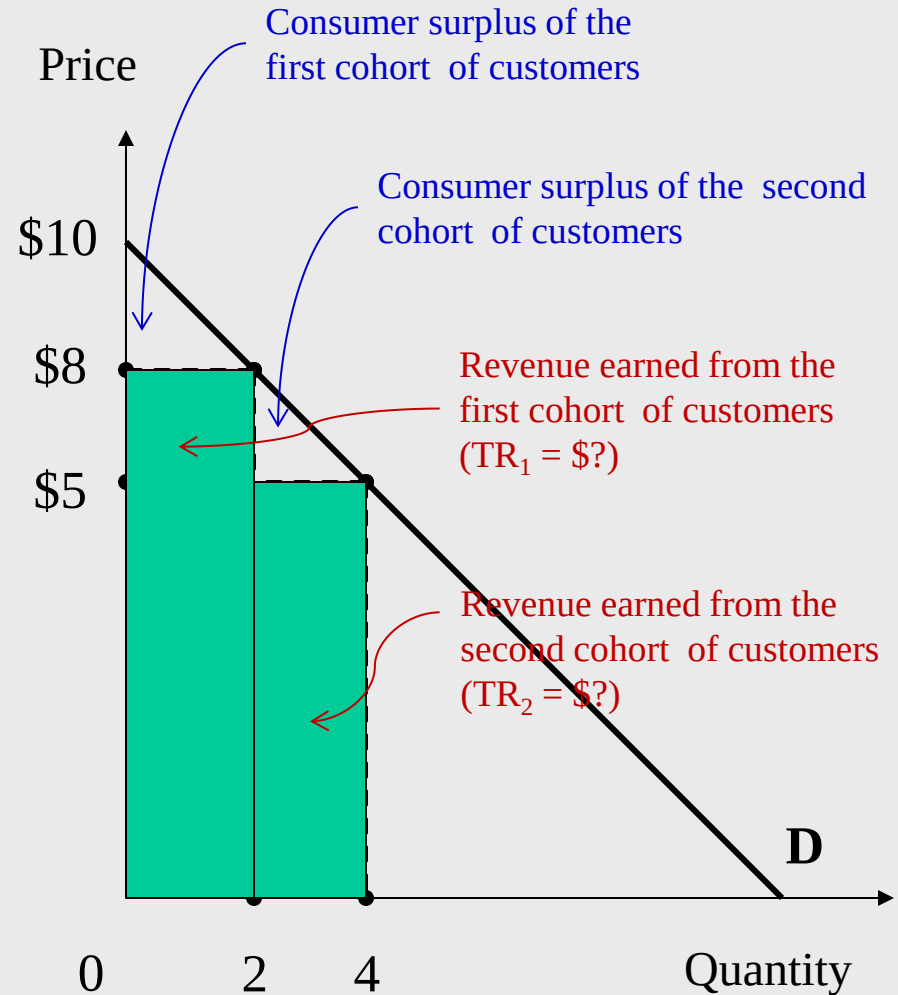
Price



*Assuming there is no fixed costs

Second-degree price discrimination

- It refers to the practice of posting a discrete schedule of declining prices for different quantities.
- Sellers are not able to differentiate between different types of consumers. Thus, the suppliers will provide incentives for the consumers to differentiate themselves according to preference, which is done by quantity discounts, or non-linear pricing.

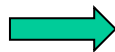


Third-Degree Price Discrimination

- Firms are able to recognize that the demand for their product differ systematically across consumers in different.
- Firms can maximize total revenue by charging different groups of consumers different prices for the same product,
- Suppose the total demand for a product is comprised of two groups of customers with different elasticities $|E_1| < |E_2|$.

Notice that Group 1 is more price sensitive (elastic) than Group 2.

$$\begin{array}{c} P_1 \left[\frac{1 + E_1}{E_1} \right] = MC \\ \underbrace{\hspace{1.5cm}}_{MR_1} \\ P_2 \left[\frac{1 + E_2}{E_2} \right] = MC \\ \underbrace{\hspace{1.5cm}}_{MR_2} \end{array}$$

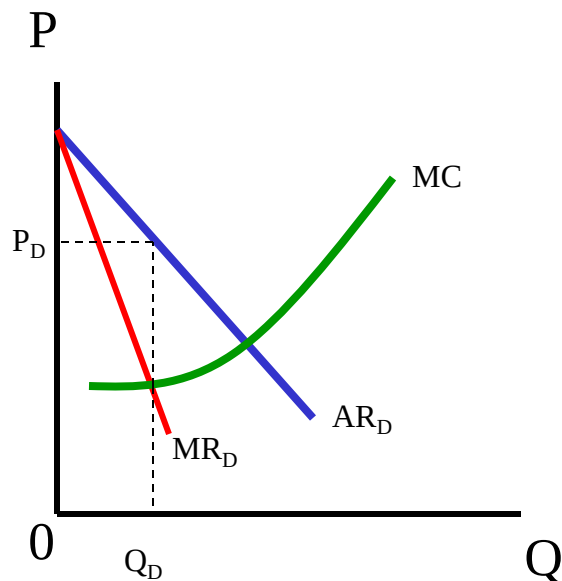


$$P_1 = [|E_1| / (1 - |E_1|)] \times MC$$

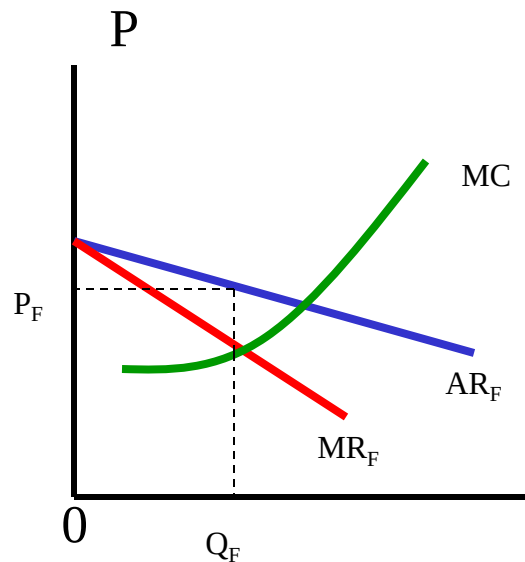
$$P_2 = [|E_2| / (1 - |E_2|)] \times MC$$

An example of dumping

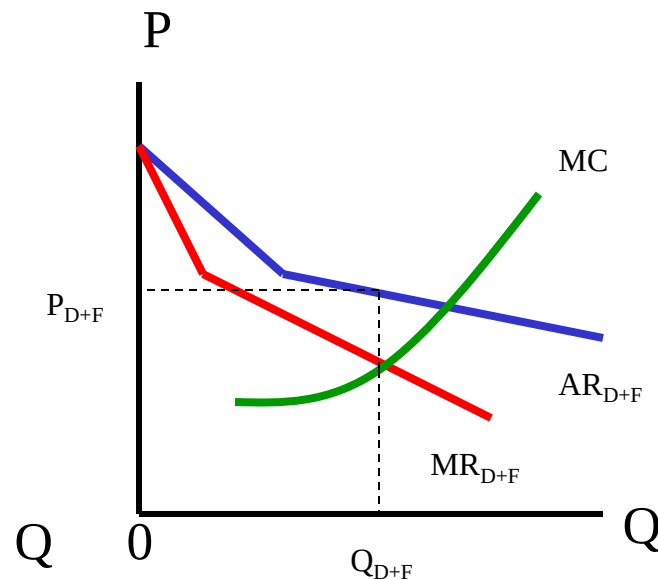
Domestic market
(relatively inelastic demand)



Foreign market
(relatively elastic demand)



Total market demand
(domestic plus foreign)



By adhering to the $MC = MR$ principle, the monopolist maximizes profit by allocating his total equilibrium output $0Q_{D+F}$ among the two sub-markets, and charging a higher price in the sub-market where the demand elasticity is less.



What type of price discrimination do the taxi industry use for the taxi fare mechanism of “raising short-haul fares and lowering long-haul fares” established in 2008 .?

What type of price discrimination do airlines use to charge different ticket price between the business and economy class?

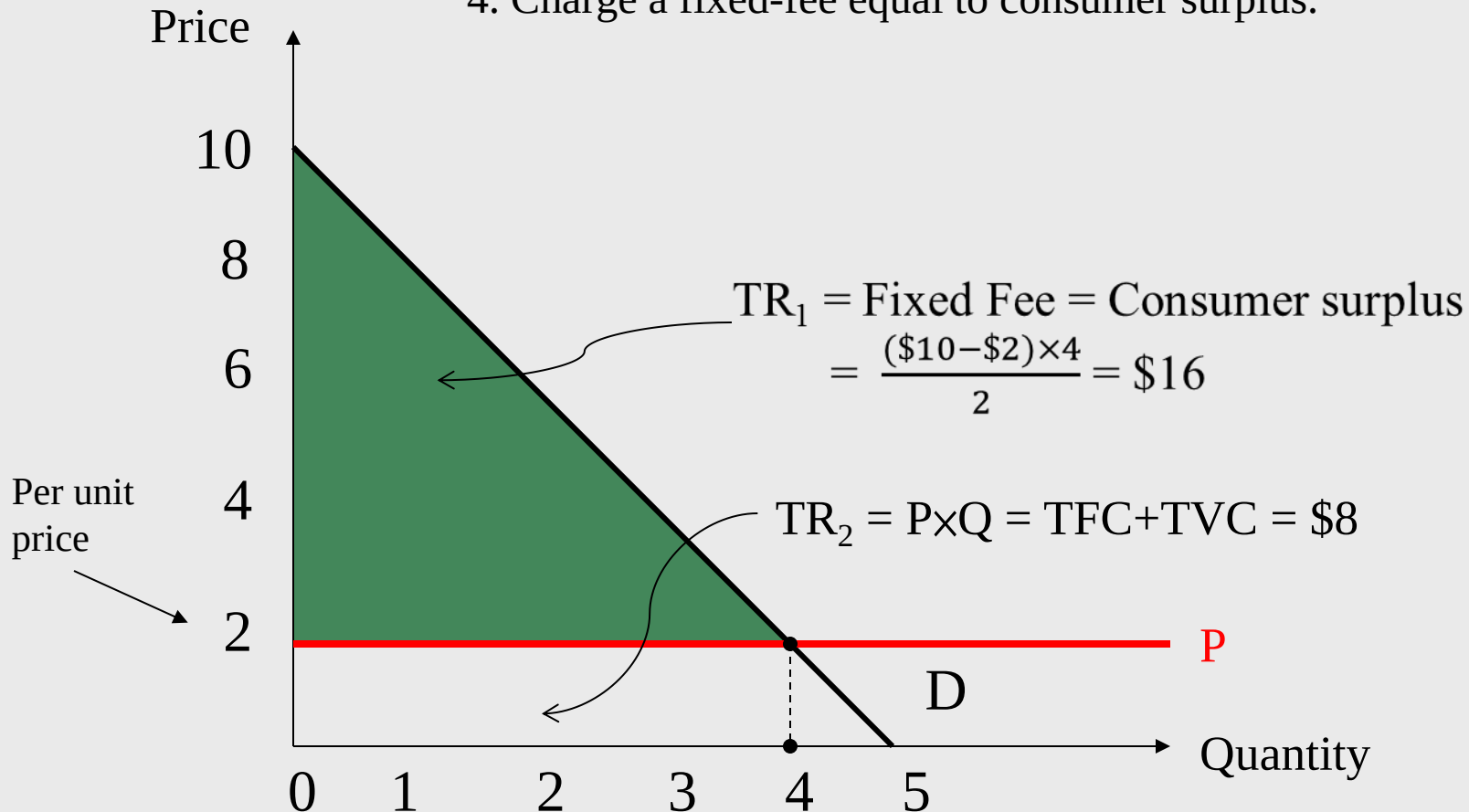
What type of price discrimination do the MTR Corporation Ltd. charge different fares between the first-class and standard-class carriages for the same East Rail Line journey?

(2) Two-Part Pricing

- Two-part pricing consists of a fixed fee and a per unit charge : a firm charges a fixed fee for the right to purchase its goods, plus a per-unit charge for each unit purchased (Example : Athletic club membership).
- Like first-degree price discrimination, two-part pricing may permit firms to extract all surplus from consumers. two-part pricing allows a firm to extract.

the process of two-Part Pricing:

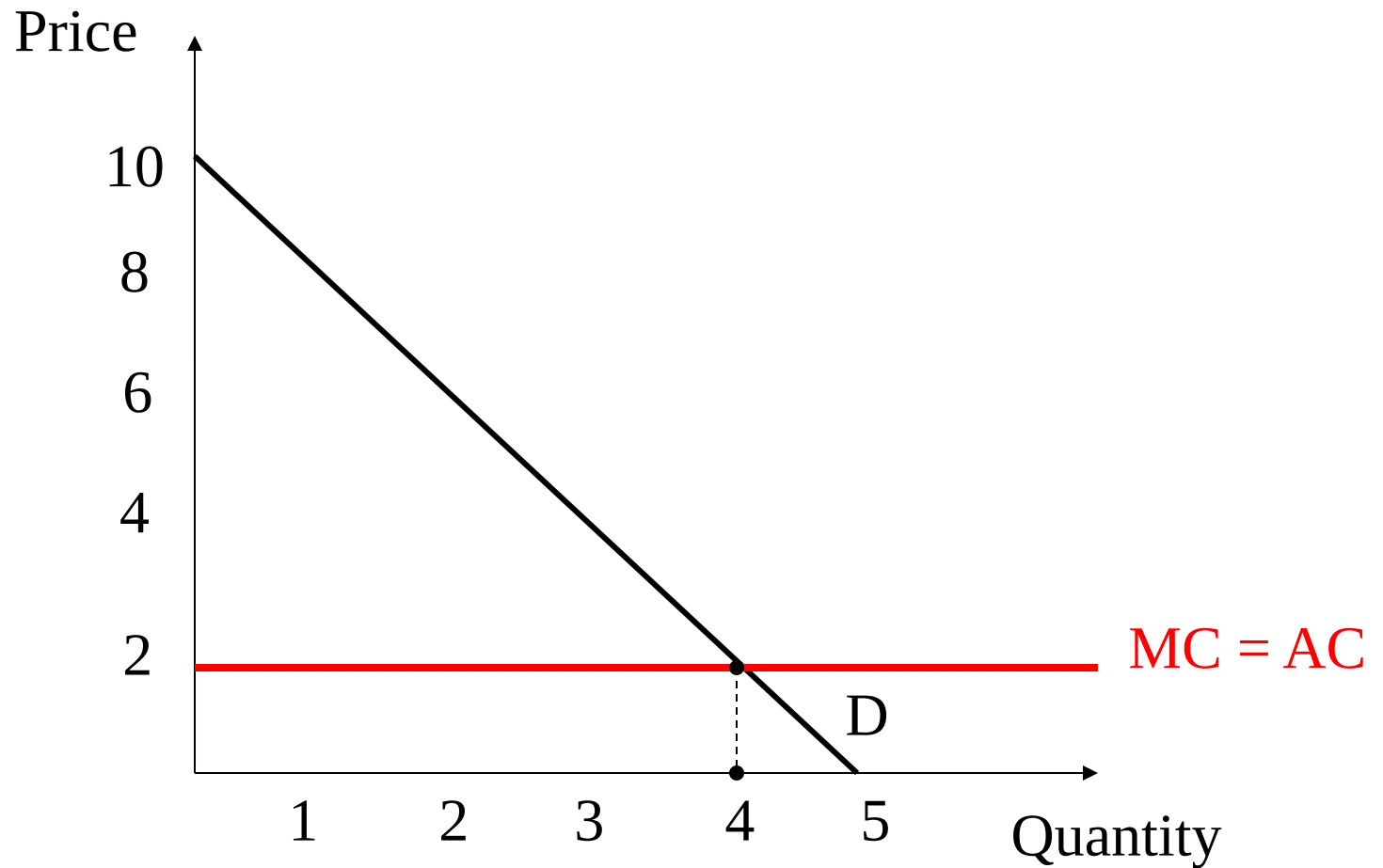
1. estimate the demand function.
2. estimate quantity demanded.
3. Set the per unit price to cover total cost (fixed and variable costs)
4. Charge a fixed-fee equal to consumer surplus.



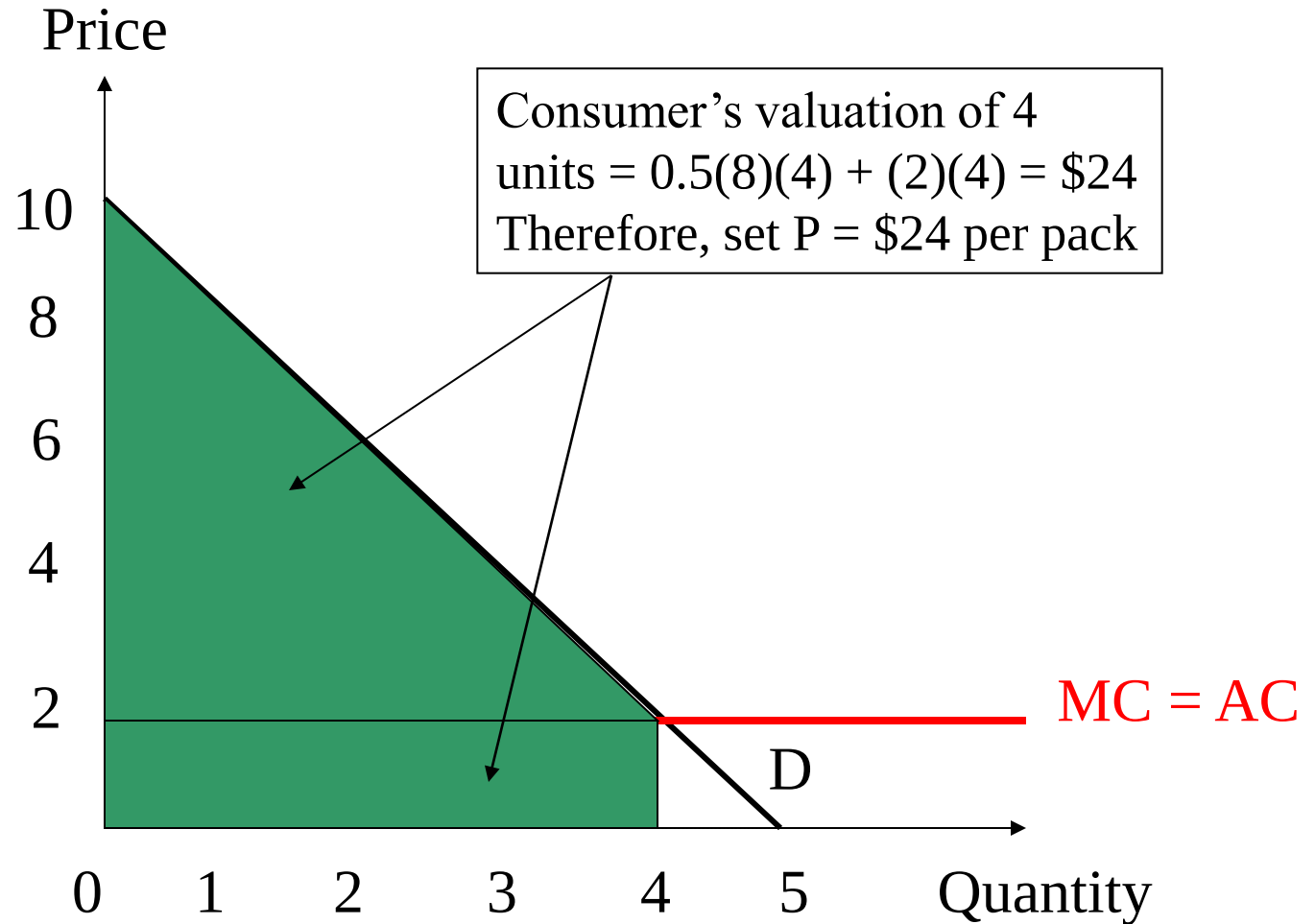
(3) Block Pricing

- The practice of a firm packaged multiple units of its product and charged a price for the package.
- Pricing strategy in which identical products are packaged together in order to enhance profits by forcing customers to make **an all-or-none decision** to purchase.
- Examples
 - Vinda's toilet paper in packages of 10 rolls
 - Cans of Coca-Cola in a six-pack

Example: Optimal quantity to package: 4 units



Example: Optimal Price for the Package: \$24



(4) Commodity Bundling

- The practice of bundling two or more products together and charging one price for the bundle.
- Examples
 - Computers and monitor
 - Vacation packages.
 - Set lunch

Examples: Computer and Monitor

(HK\$)

	Consumer valuation	
Consumer	Computer	Monitor
A	3000	400
B	2000	600

Assuming the cost of computer and monitor are one half of their selling price. To maximize the computer shop's profits, what prices should be charged for the sale of these two goods?

(HK\$)

	Consumer valuation	
Consumer	Computer	Monitor
A	3000	400
B	2000	600

$P_{\text{Computer}} = \$3000$; $P_{\text{Monitor}} = \$600$	
Consumer A	\$3000
Consumer B	\$600
The computer shop	$\$3600 - \$1800 = \$1800$

$P_{\text{Computer} + \text{Monitor}} = \$2400$	
Consumer A	\$2400
Consumer B	\$2400
The computer shop	$\$4800 - \$2400 = \$2400$

Auctions

<http://www.christies.com/auctions/hong-kong>

<https://new.liveauctioneers.com/>

<https://www.youtube.com/watch?v=gq0wsXOKlL4>

- In an **auction**, potential buyers compete for the right to own a good, service, or, more generally, anything of value.
- Auctions are used to sell a variety of things, including art, Treasury bills, furniture, real estate, oil leases, corporations, electricity, and numerous consumer goods at auction sites on the Internet.
- When **the seller is the owner of the item**, as in an art auction, she or he wishes to obtain the highest possible price for the item.
- Buyers (**bidders**), on the other hand, seek to obtain the item at the lowest possible price.

Definition

- An auction is a negotiation mechanism.
- Auction refer to arbitrary resource allocation problems with self-motivated participants.
- A public sale in which goods or property are sold to the highest bidder.

Auction trading operations

Open outcry methods :

1. 2-sided cry
2. 1-sided cry

Auction quantity :

1. Multi-unit
 - uniform
 - discriminative
2. Single unit

Major types of auctions

1. English Auctions
2. First-price sealed-bid auctions
3. Second-price sealed-bid auctions
4. Japanese auction
5. Elimination (survival) auction
6. Continuous double auctions
7. Dutch Auctions

1. English Auctions

- It also called ascending-price auctions or first-price open-cry auctions
- It is an one-sided auction (only buyers bid) in which usually a single item is offered for sale.
- Each bidder is free to revise his bid upwards, when no bidder wishes to revise his bid further, the higher bidder wins the object and pays his bid.

2. First-price sealed-bid

- It is also known as blind auction , Vickrey auction, or Yankee Auctions .
- It is developed from the English auctions.
- Each bidder submits one hidden bid in ignorance of other bids (bidders place their bid in a sealed envelope) .
- The higher bidder pays his bid and wins the object; if there are remaining units, the second highest bidders will buy them.
- Sellers provide a given units of the auctioned goods, and bidders need to set both the purchase price and quantity. Bidders' challenge is to guess the bids of other buyers.

3. Second-price sealed-bid

- It is developed from the English auctions, and is a special case of a Vickrey auction.
- Each bidder submits a sealed bid to the seller, and then the high bidder wins and pays the second-highest bid for the good.
- Although this auction model is rarely used, but it is a very useful game theory model.

4. Japanese auction

- Auctioneer calls out ascending prices.
- Bidders are initially “in”, and drop out at certain prices.
- Last bidder standing gets it at that price.
- Multi-unit version: bidders call out quantities rather than simple “in” or “out”, and the quantities decrease between rounds when the auction price is going up. Auction ends when supply meets demand.

5. Elimination (survival) auction

- This new auction type invented at Stanford University.
- Motivation: the best of English/Japanese and sealed bid.
- Process: Multiple sealed-bid rounds. In each round the lowest bidder drops out and their bid becomes the reserve price for next round.

6. Continuous double auction

- It is also developed from the English auctions.
- Two sided cry: Matches are made continuously based on the difference between the “bid” price (willingness to pay) and the “ask” price (amount seller wants).
- Orders are matched periodically
- Bidder challenge: guessing future movement of clearing prices.
- NASDAQ, NYSE, and most money markets work this way.

7. Dutch Auctions

- It also called descending-price auctions or reverse auctions.
- One-sided (only buyers bid), and has the advantage of closing quickly.
- The auctioneer begins with a high asking price for some quantity of like items; the price is lowered until a participant is willing to accept the auctioneer's price for some quantity of the goods in the lot (or until the seller's reserve price is met).
- Such as money market instruments (such as Treasury bills and commercial papers), the Netherlands Flower auction, and the Canadian province of Ontario tobacco auctions of Ontario in Canada are based on this method.

Factors affecting the choice of appropriate auction techniques

(1) Common-value auction

It refers to the auction of articles which have objective market value. If the value of the item for sale is not identical amongst bidders, it is a private-value auction (such as antiques, paintings, collectibles, etc.)

(2) The winner's case

It is the trade-off between the probability of winning the auctioned item and the expected profit from winning, when all other participants appear to be estimating a lower market value.

(3) The Revenue Equivalence Theorem

Under some reasonable constraints (e.g. players risk-neutral, the same participate in the auction, the same auction items), all four of the standard single unit auctions should result in the same outcomes (i.e. allocates items to the same bidders) also has the same expected revenue.

Revenue equivalence theorem helps to find some equilibrium strategies

(4) Collusion

Collusion at an auction can involve bidders (buyers), sellers, and/or auctioneers.

Bidders collusion

Typically, bidders collude by agreeing with each other to not bid against each other, allowing prices to decrease accordingly. Then, those who were involved in the collusion later divide up or apportion the excess profits made by each buying at a discount.

Seller collusion

Sellers collude generally by bidding on their own items, or employing someone to bid for them, to falsely increase prices buyers are required to pay.

Auctioneer collusion

Auctioneers can collude by either misrepresenting items they are selling, or selling them quick to a bidder who is bidding for the auctioneer's interest. Alternately, auctioneers sometimes bid with the sole intent of raising prices that the buyer(s) must pay.

Thank you
for your attention !