

EE 366 Economics of Services Sector

Chapter 4: Service Market Analysis (Structure, Conduct and Performance)



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Market Structure

	Perfect Competition	Monopolistic Competition	Oligopoly	Monopoly
Number of firm	Very Many	Many/ Several	Few	One
Freedom of entry	Unrestricted	Unrestricted	Restricted	Completely blocked
Nature of product	Homogeneous	Differentiated	Homogeneous or Differentiated	Unique
Implications for demand curve faced by firm	Horizontal (Price taker)	Downward sloping, but relatively elastic	Downward sloping, relatively inelastic	Downward sloping, more inelastic than oligopoly.
Firm size	Small firms	Small firms	Few large firms	One big firm
Possible consumer demand	Highly elastic	Elastic	Inelastic	Highly inelastic
Firm Profit	Normal profits	Economic profits in short run; normal profits over long run	Losses to normal and economic profits in short run and long run	Economic profits in short run and long run
Government Intervention	Minimal	Minimal	Moderate to highly	Highly to nationalization
Example	Agricultural products	Retail stores and restaurant	Automobiles	Public utilities

Source: Pindyck and Rubinfeld (2013): Microeconomics

Market Power (examples of measures)

- ❖ The Lerner Index
- ❖ The Concentration Ratio
- ❖ Herfindahl Index

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Market Power Measures: The Lerner Index

- ❖ **Lerner Index (L)**: Firm's ability to set its' **product price (P)** above marginal cost (**MC**). It measures **firm's market power**

$$L = \frac{P - MC}{P} = -\frac{1}{\eta} \quad \text{where} \quad \eta = \frac{\partial q}{\partial p} * \frac{p}{q} \quad \eta = \text{Demand price elasticity}$$

✓ **Perfect competition market**



Firm is price taker



$P = MC$
 η is infinite



$L = 0$
Firm does not have market power

✓ **When firm has some market power**



$P > MC$
 η is less than infinite



$L > 0$ and
 $0 \leq L \leq 1$

When L close to 1



Firm has high market power

The higher L the higher firm's market power

- ❖ **Concentration Ratio (CR)**: The sum of market share of large firms in the industry. It measures the industry's **market power**

CR – 4 = Total market share of four largest firms in the industry

CR – 8, CR – 12, CR – 15,

✓ **The higher CR the higher industry market power and the higher monopoly level**

✓ **Limitation of CR**

- No information about number of firms in the market
- Markets with the same level of CR-4 do not have the same level of monopoly if number of firms and market share of those 4 firms are different

- ❖ **Herfindahl Index (HI) or Herfindahl-Hirschman Index (HHI)**: The sum of square of market share of each firm competing in the market

$$HI \text{ or } HHI = S_1^2 + S_2^2 + S_3^2 + \dots + S_n^2$$

S_i^2 = Market share of firm i . Suppose there are n firms in the market

- ✓ Unlike Concentration Ratio, **HI** employs market share of all firms in the market in the calculation

- ✓ If there is **one firm** in the market



$$HI = 1^2 = 1$$

- ✓ If there are **two firms** in the market with the same market share



$$HI = \left[\frac{1}{2}\right]^2 + \left[\frac{1}{2}\right]^2 = \frac{1}{2}$$

- ✓ If there are **n firms** in the market with the same market share



$$HI = \left[\frac{1}{n}\right]^2 + \left[\frac{1}{n}\right]^2 + \left[\frac{1}{n}\right]^2 + \dots + \left[\frac{1}{n}\right]^2$$

- ✓ So if n is large and each firm does not have market share larger than others



HI is getting close to 0

- ✓ So **$0 < HI < 1$** **The higher H means the high level of market concentration**

❖ Price strategy

For example

- ✓ Price discrimination
- ✓ Two-part tariff pricing
- ✓ Bundling strategy
- ✓ Price under price leadership model
- ✓ Other price strategy

❖ Non-price strategy

For example

- ✓ Product differentiation

2 Strategy: Price discrimination

First degree price discrimination or perfect price discrimination

- Occurs when a business charges the maximum possible price for each unit consumed. Because prices vary among units, the firm captures all available consumer surplus for itself.
- **Example:** Many industries involving client services practice first-degree price discrimination, where a company charges a different price for every good or service sold.

Second degree price discrimination

- Occurs when a company charges a different price for different quantities consumed,
- **Example:** quantity discounts on bulk purchases, discount on second or third unit purchase.

Third degree price discrimination

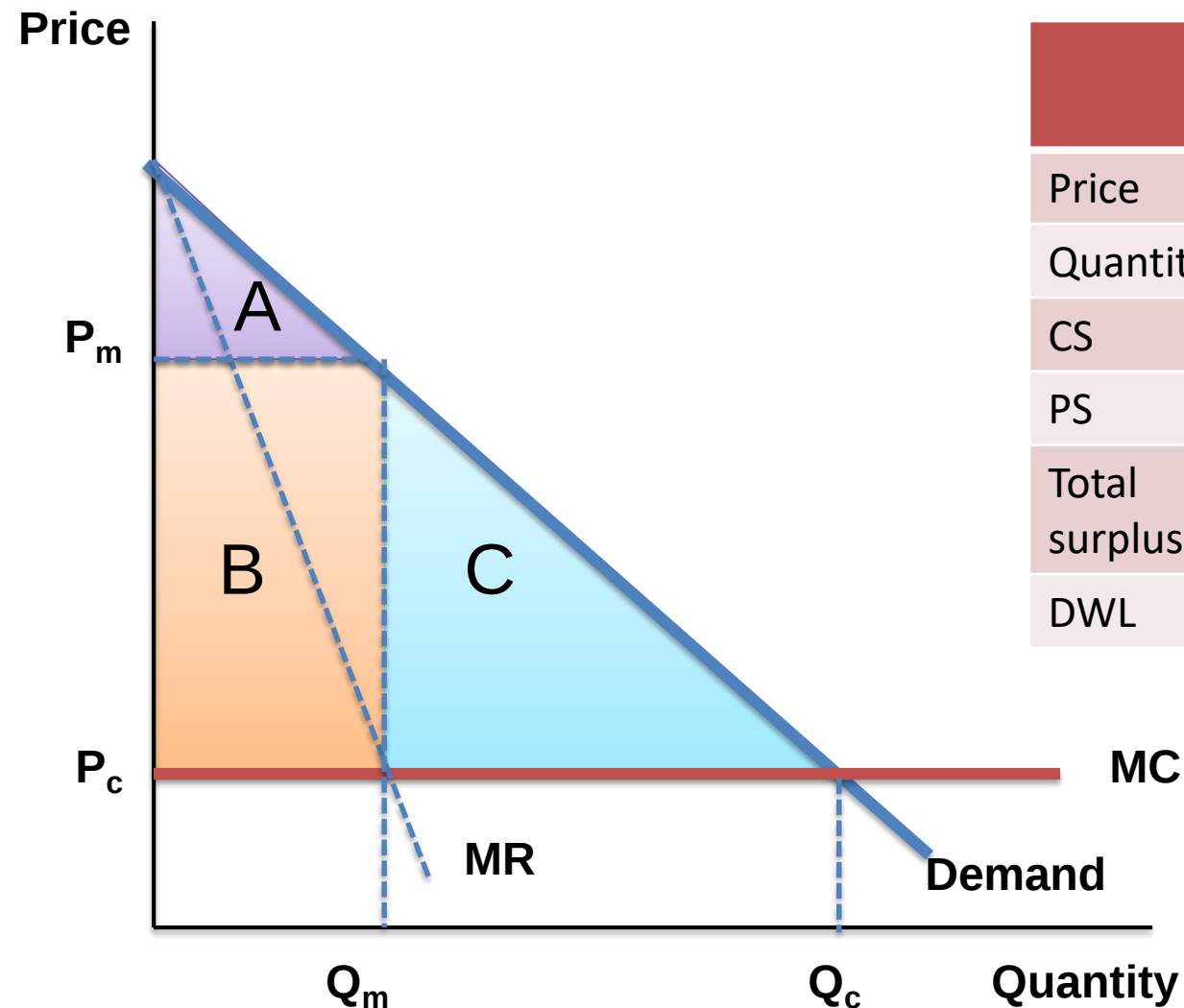
- Occurs when a company charges a different price to different consumer groups
- **Example:** A theater may divide moviegoers into seniors, adults, and children, each paying a different price when seeing the same movie. This discrimination is the most common.

2 Strategy: Two-Part Tariff Strategy

- **The Two-Part Tariff** is related to price discrimination and provides another means of extracting consumer surplus.
- This price strategy can be divided into two parts: The entry fee (or membership fee) and the usage fee (or a fee of each unit used)
- **Example:** Tennis and golf club, Telephone service, Credit card services, and Disneyland ticket.

2.1 Strategy: Two-Part Tariff Strategy (Cont.)

Case1: When consumers have homogeneous demand (one consumer is representative of the market. (MC is assumed to be constant)



	Uniform pricing	Two-part Tariff
Price	P_m	P_c
Quantity	Q_m	Q_c
CS	A	Zero
PS	B	$A+B+C$
Total surplus	$A+B$	$A+B+C$
DWL	C	Zero

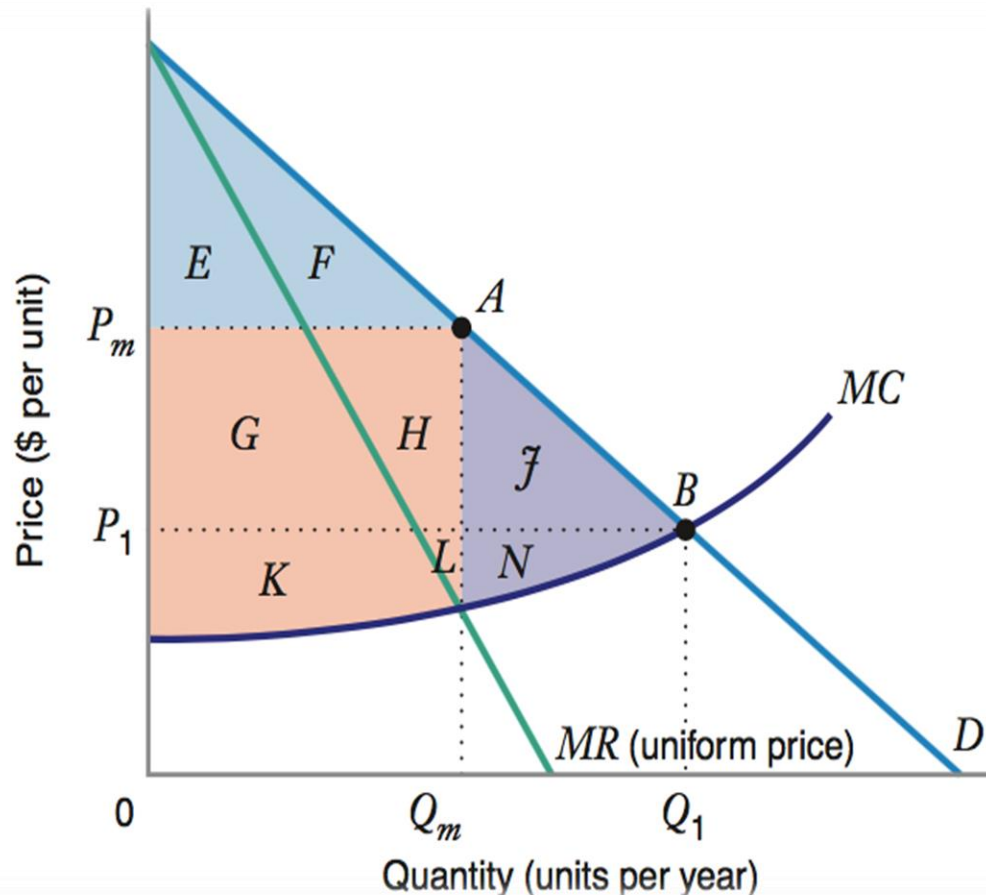
✧ The usage fee = P_c

✧ An entry fee = $A+B+C$

In this case, firm takes all consumer surpluses (Area ABC).

2.1 Strategy: Two-Part Tariff Strategy (Cont.)

- ✓ **Case1:** When consumers have homogeneous demand (one consumer is representative of the market).
- ✓ The producer captures **all the surplus** and there is no deadweight loss



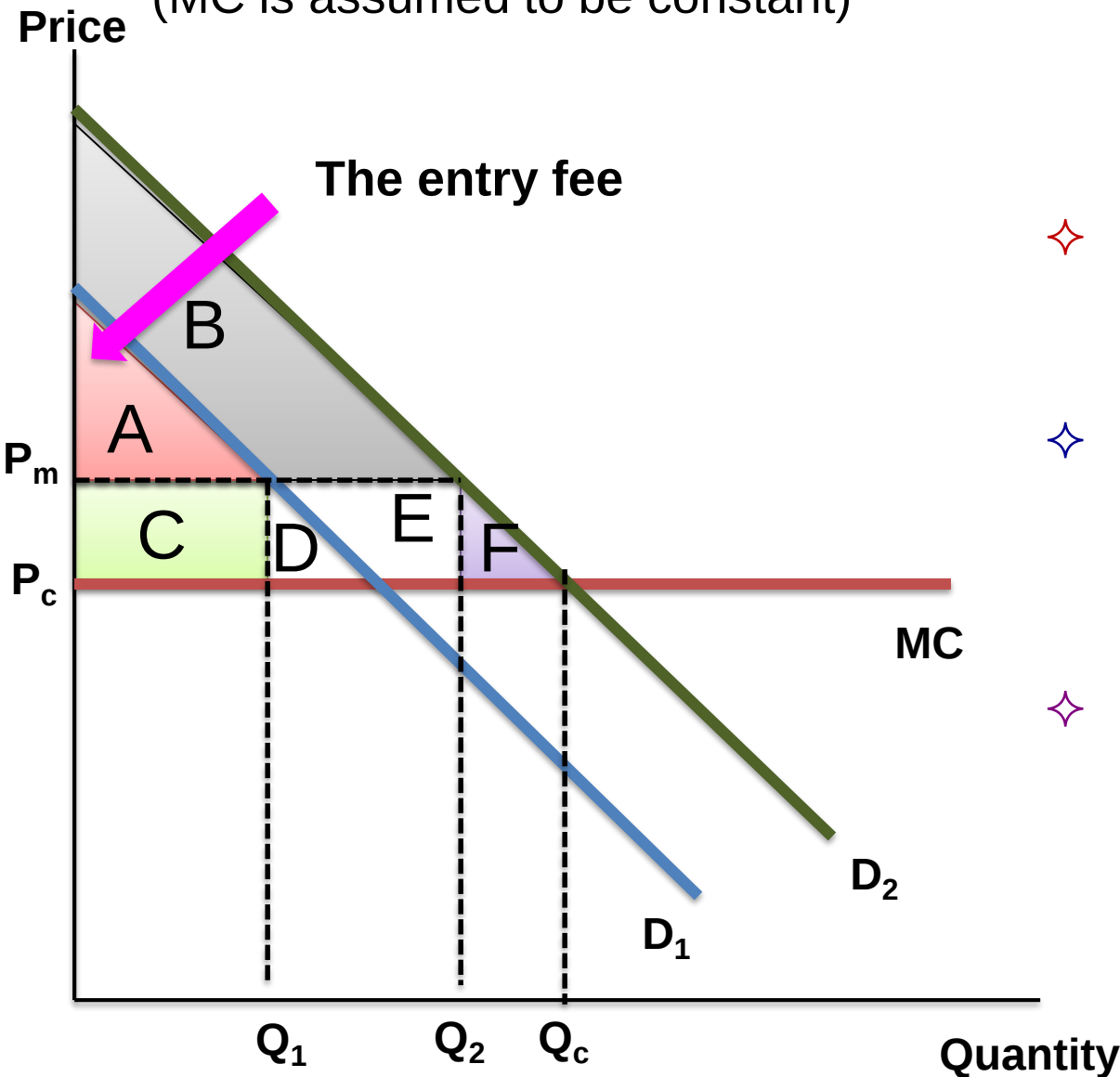
	Uniform pricing	Two-part Tariff
Price	P_m	P_1
Quantity	Q_m	Q_1
CS	$E+F$	Zero
PS	$G+H+K+L$	$E+F+G+H+J+K+L+N$
Total surplus	$E+F+G+H+K+L$	$E+F+G+H+J+K+L+N$
DWL	$J+N$	Zero

✧ The usage fee = P_1

✧ An entry fee = $E+F+G+H+J$

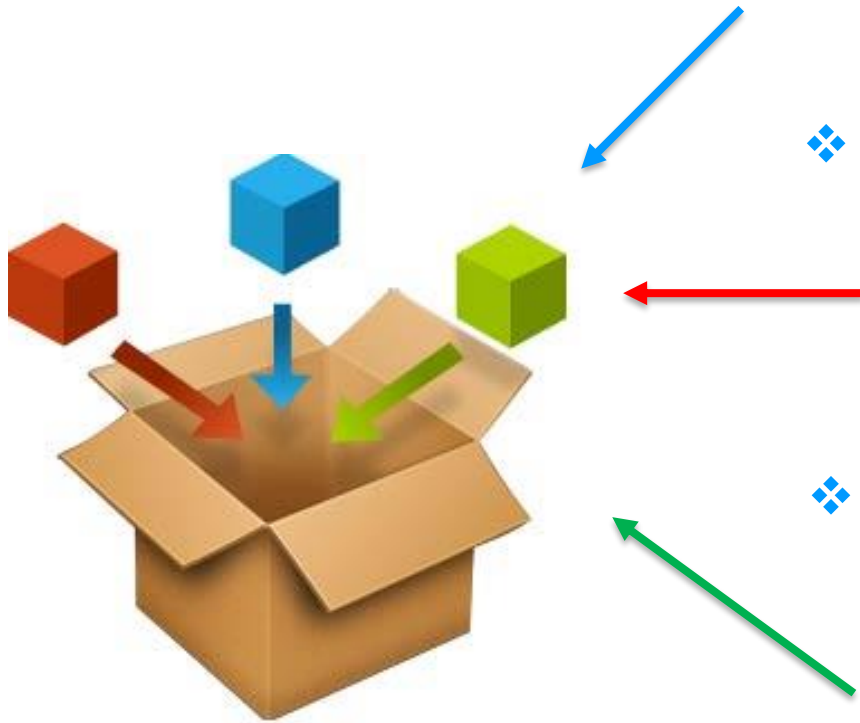
2.1 Strategy: Two-Part Tariff Strategy (Cont.)

Case2: When consumers have heterogeneous demand.
(MC is assumed to be constant)



Strategies

- ✧ The usage price = P_m ($P > MC$)
- ✧ The entry fee = area A (Surplus of consumer with the smaller demand.)
- ✧ Profit = $2A + (P_m - MC)(Q_1 + Q_2)$



- ❖ **Bundling** refers to sales in which customers are required to either purchase goods in a package or purchase goods separately.
- ❖ **Bundling** can increase profits when customers have different tastes (different willingness to pay) for the two products and when the firm cannot price discriminate.
- ❖ **Example**

- Restaurant
- Vacation Package
- Insurance





Ex.1

	Reservation price (Maximum willingness to pay)	
	Hotel	Airline Ticket
Customer 1	\$1,200	\$600
Customer 2	\$1,500	\$400
Marginal Cost	\$1,000	\$300

Bundling can **increase profit** when customer preferences are

negatively correlated

Without bundling



Price = \$1,200

Sale both 1 and 2

Profit = $(1,200 - 1,000) \times 2 = \400

Price = \$1,500

Sale only 2

Profit = $(1,500 - 1,000) \times 1 = \500

Price = \$400

Sale both 1 and 2

Profit = $(400 - 300) \times 2 = \$200$

Price = \$600

Sale only 1

Profit = $(600 - 300) \times 1 = \$300$

With bundling



+



Price = \$1,800

Sale both 1 and 2

Profit = $(1,800 - 1,300) \times 2 = \$1,000$

More profits





- Bundling can not *increase profit* when customer preferences are *positively correlated*

Ex.2

	Reservation price (Maximum willingness to pay)	
	House Insurance	Car Insurance
Customer 1	\$1,200	\$400
Customer 2	\$1,500	\$600
Marginal Cost	\$1,000	\$300

Without bundling



Sale only

2

Sale = \$1,500

Sale = \$600

Profit = \$500

Profit = \$300

Total profit

\$800

With bundling



Sale only

2

Sale = \$2,100

Profit = \$800

Total profit

\$800



- Firms often allow customers to purchase components *individually*, as well as offering *a bundle*.

Ex.3: Mixed Bundling

	Reservation price (Maximum willingness to pay) (Per year)	
	Fitness	Boxing
Customer 1	\$900	\$800
Customer 2	\$1,100	\$600
Customer 3	\$1,300	\$400
Customer 4	\$1,500	\$200
Marginal Cost	\$1,000	\$300

The preference of consumer 2 and 3 is *negatively correlated*



Ex.3: Mixed Bundling

Option	Price	Sale for customer	Profit
1.No bundling	Fitness: \$1,300	3 + 4	$(1,300 - 1,000) * 2 = \$600$
	Boxing: \$600	1 + 2	$(600 - 300) * 2 = \$600$
			Total profit = \$1,200
2.Pure bundling	Fitness & Boxing \$1,700	1 + 2 + 3 + 4	Total profit $(1,700 - 1,300) * 4 = \$1,600$
3.Mixed bundling	Fitness: \$ 1,499	4	$1,499 - 1,000 = \$499$
	Boxing: \$799	1	$799 - 300 = \$499$
	Fitness & Boxing \$1,700 (negative relationship)	2 + 3	$(1,700 - 1,300) * 2 = \$800$
			Total profit = \$1,798

2.3

Strategy: Product Differentiation

- **Definition:** Two goods are differentiated good if they are substitutes but not perfect substitutes.

Horizontal Differentiation

- ✓ Goods are different but at the same price some consumers will buy one and some will buy other, it really depends on their preferences.



Vertical Differentiation

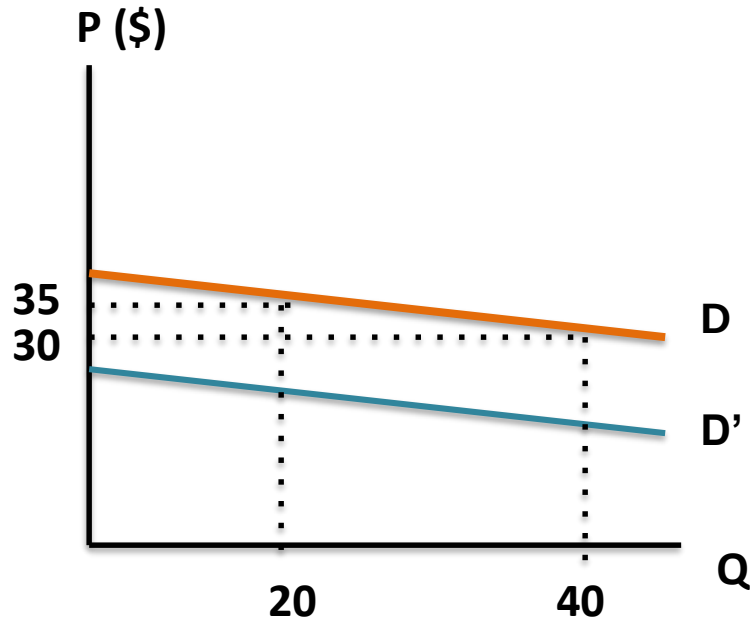
- ✓ Goods are different and all consumers would prefer one to the other if they were sold at the same price. Goods are of different qualities.



2.3 Strategy: Product Differentiation (Cont.)

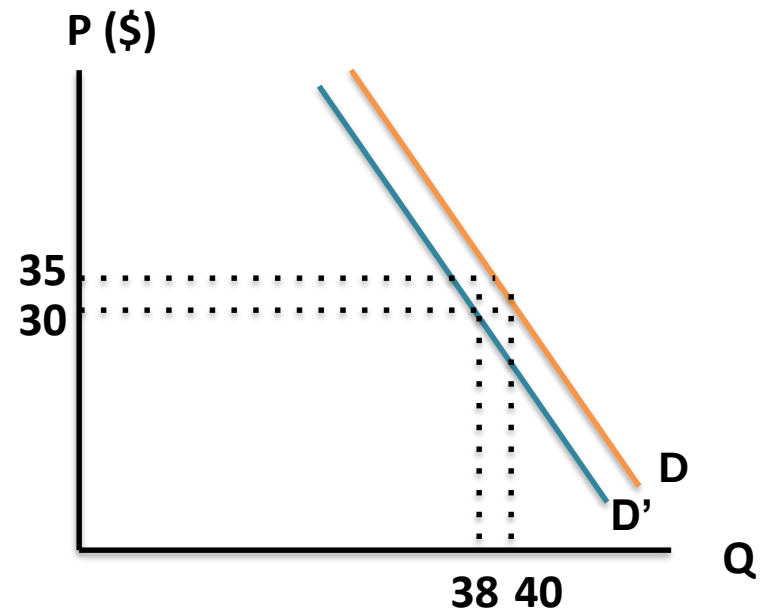
- **Horizontal differentiation** is an important concept for the theory of **oligopoly** and **monopolistic competition**.
- This is because some consumers have loyalties toward one brand over the other, and thus do not regard the products as perfect substitutes.

Figure A: Weak horizontal differentiation



The firm's demand is quite sensitive to a change in its own price and the prices of its rivals.

Figure B: Strong horizontal differentiation



The firm's demand is much less sensitive to a change in its own price and the prices of its rivals.

2.3 Strategy: Product Differentiation (Cont.)

Figure A: Weak horizontal differentiation

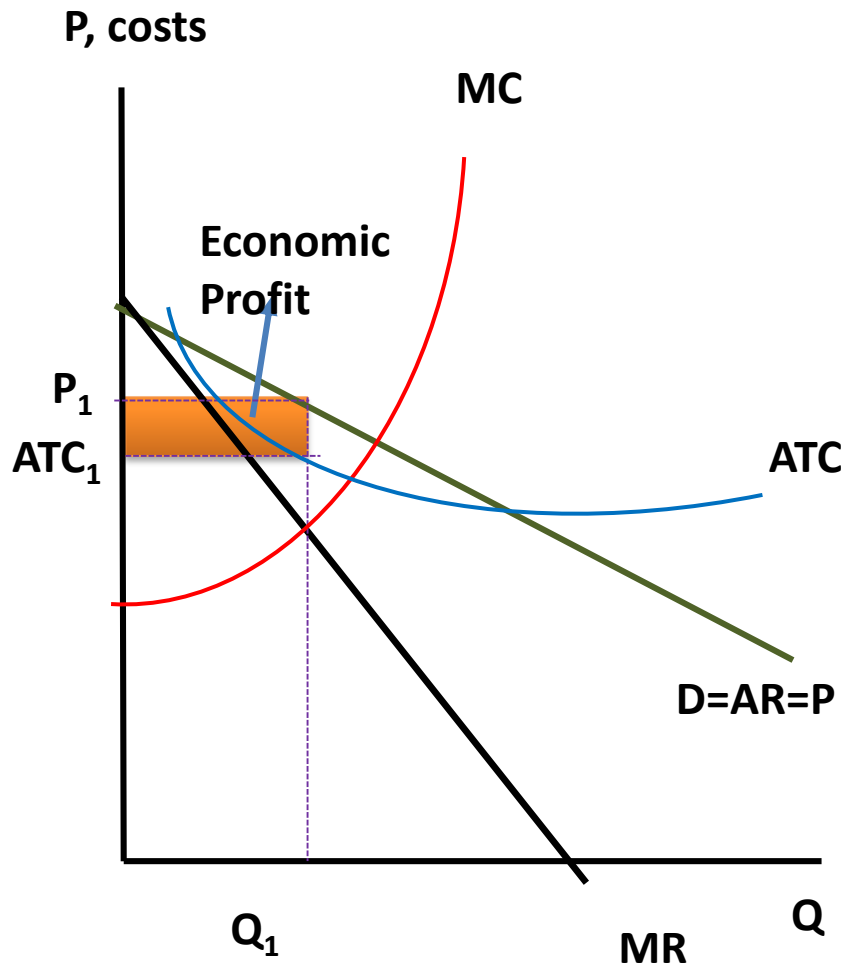
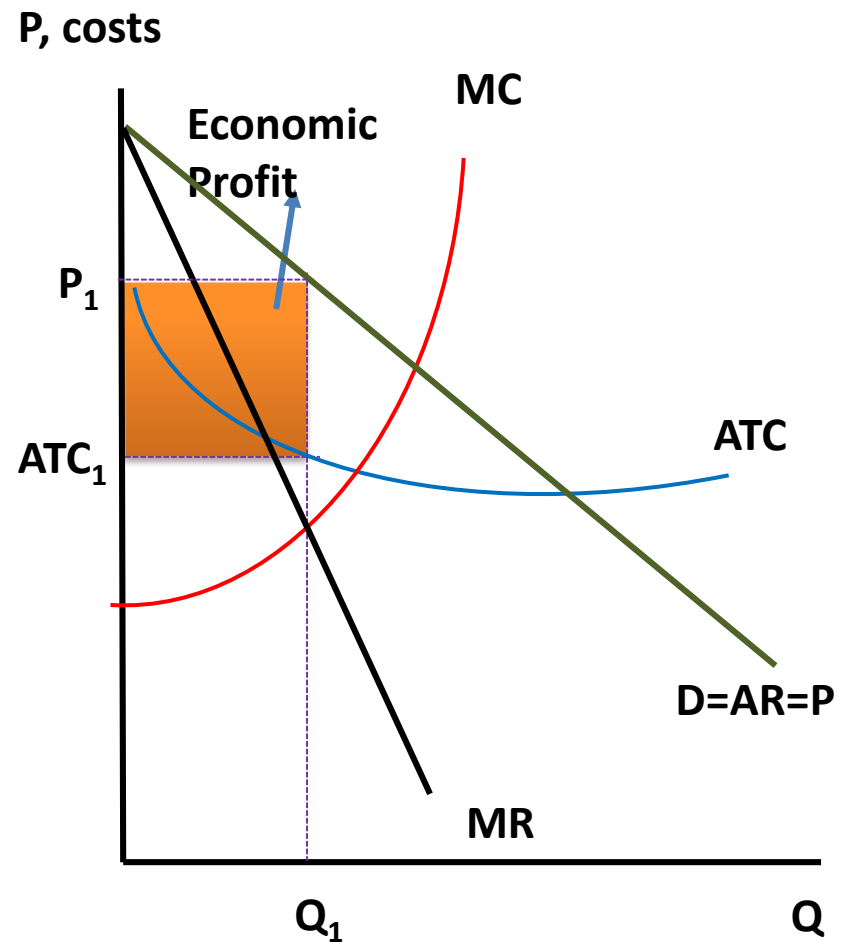


Figure B: Strong horizontal differentiation



3 Performance

Performance measures might depend on a firm's **short term goals** and/or **long term goals**. Might include for example,

- ❖ Total sales
- ❖ Sales growth
- ❖ Total Profit
- ❖ Rate of return such as
 - ✓ return on asset (ROA)
 - ✓ return on equity (ROE)
- ❖ Market share
- ❖ Production efficiency
- ❖ Customer recognition

Reference

- ❑ David Besanko, and Ronald Braeutigam,
Microeconomics, 4th edition
- ❑ Robert Pindyck and Daniel Rubinfeld (2012),
Microeconomics, 8th edition



Discussion

1. Explain **market structure** of your group service industry. You may provide any supporting data or evidence to support your argument.
2. Explain existing **pricing strategy** employed by service providers in the market of your group service industry. What kind of pricing strategy the firm or the project you evaluate currently use (if there is any)?
3. Explain existing **non-pricing strategy** employed by service providers in the market of your group service industry.

Hint

- ✓ Do your group service industry has the characteristic of product differentiation both in terms of **horizontal differentiation** and **vertical differentiation**? Explain.
 - ✓ If there exists a horizontal product differentiation in your group service industry. Do you think it is a **weak or strong horizontal differentiation**? Explain.
 - ✓ Are there any **other non-pricing strategy** rather than product differentiation employed by service providers in the market of your group service industry?
 - ✓ What kind of non-pricing strategies the firm or the project you evaluate currently use (if there is any)?
4. Explain possible **performance measures** of the firm or project you evaluate