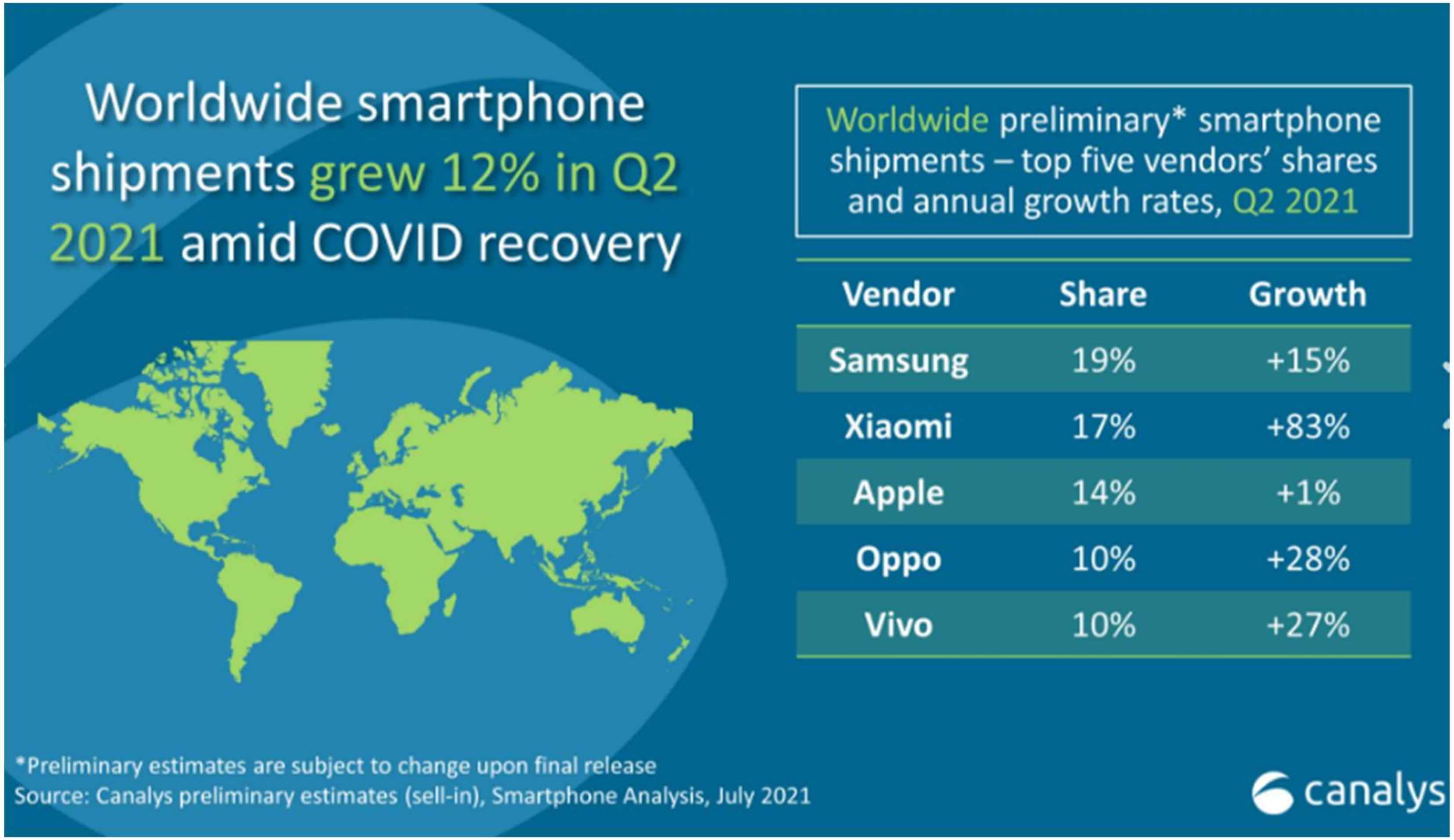
Market Structure and Firm Behavior



1. Introduction

e-commerce will undoubtedly change the way business is done. But, as we have said elsewhere, technology changes, but the economic laws do not.
– Varian (1999;1)

Costs, Economies of scale

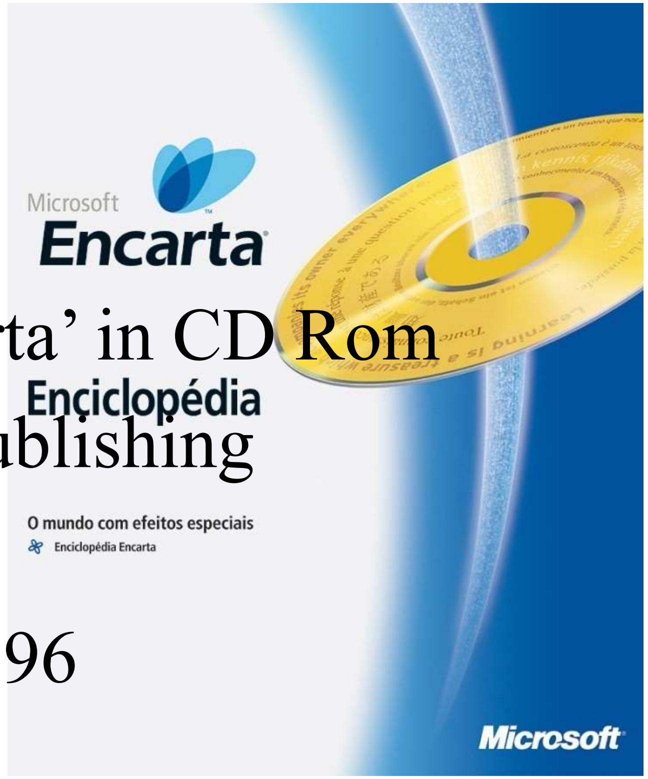
Market structure

Industry concentration and conduct

Pricing practices

2. Cost, Economies of Scale and Natural Monopoly

- Rapid change in cost structure
- EB vs. Encarta
  - EB prices $2000 in 1992
  - MS enters market with 'Encarta' in CD Rom
  - EB implemented electronic publishing
  - MS captures market
  - EB' CD Rom prices $50 in 1996



2. Cost, Economies of Scale and Natural Monopoly

(i) Costs and Economies of scale

1st copy costs dominate total cost/low MC

- Information and physical goods
- Chip production

Supply-side economy of scale: large production

- Declining ACs

2. Cost, Economies of Scale and Natural Monopoly

(ii) Natural Monopoly (NM)

Rapid growth erodes scale advantage

- WordPerfect, Lotus

ITT and Internet reduce MES (Minimum Efficiency Scale) where AC is minimized

- Editing and publish, chips

NM is not always bad

- ‘owner’ of an invention has a monopoly of its use
- Competition to acquire monopoly
- Complementary products (another invention) follow

3. Market Structure

Market structure refers to

- # of firms in an industry
- Relative size of the firms (concentration)
- Demand condition
- Ease of market entry and exit
- Technology and cost conditions

3. Market Structure

Four classes of market structures

1. Perfect competition
2. Monopolistic competition
3. Oligopoly
4. Monopoly

3. Market Structure - Firm Behavior

Market structure influences

- Behavior and decisions (conduct)

Competitive behavior

- Actions available to firm
- # of firms in the industry
- Firm’s expectation about actions
- Firm’s expectation about entry

3. Market Structure

(i) Perfect competition

Many price taking consumers and suppliers

Costless entry/exit (in theory, rarely achieved in real market)

Homogeneous goods

Easy and free access to information

3. Market Structure

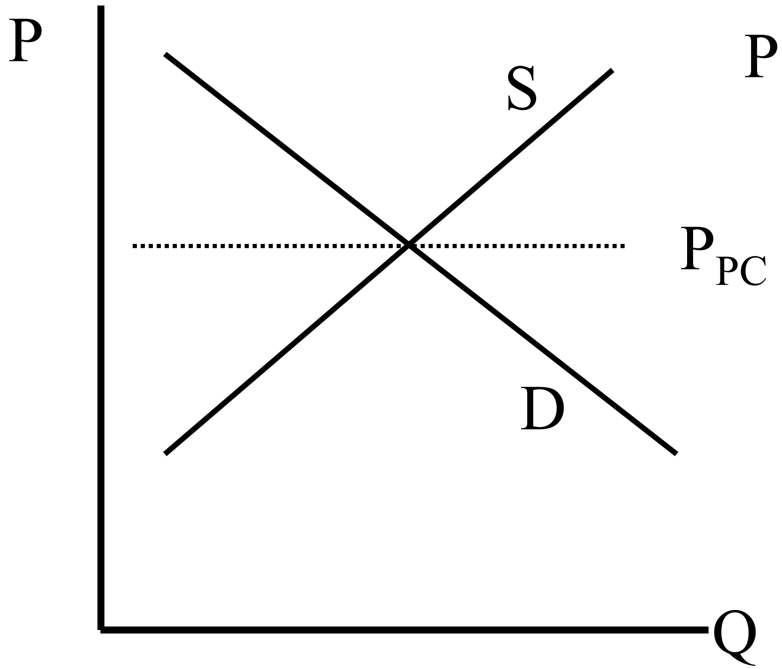
(i) Perfect competition

Examples: Though there is no actual perfectly competitive market in the real world, a number of approximations exist

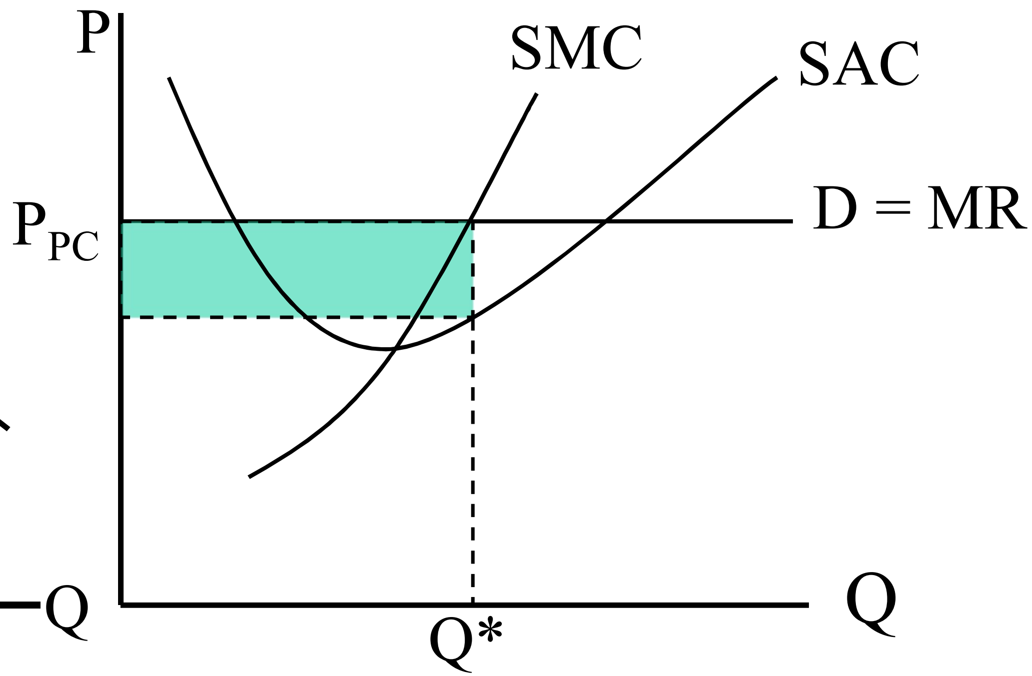
- stock exchange
- fish market and the vegetable or fruit vendors who sell at the same place

3. Market Structure: Perfect competition

Short-run: No entry/exit (no change in supply) during the period



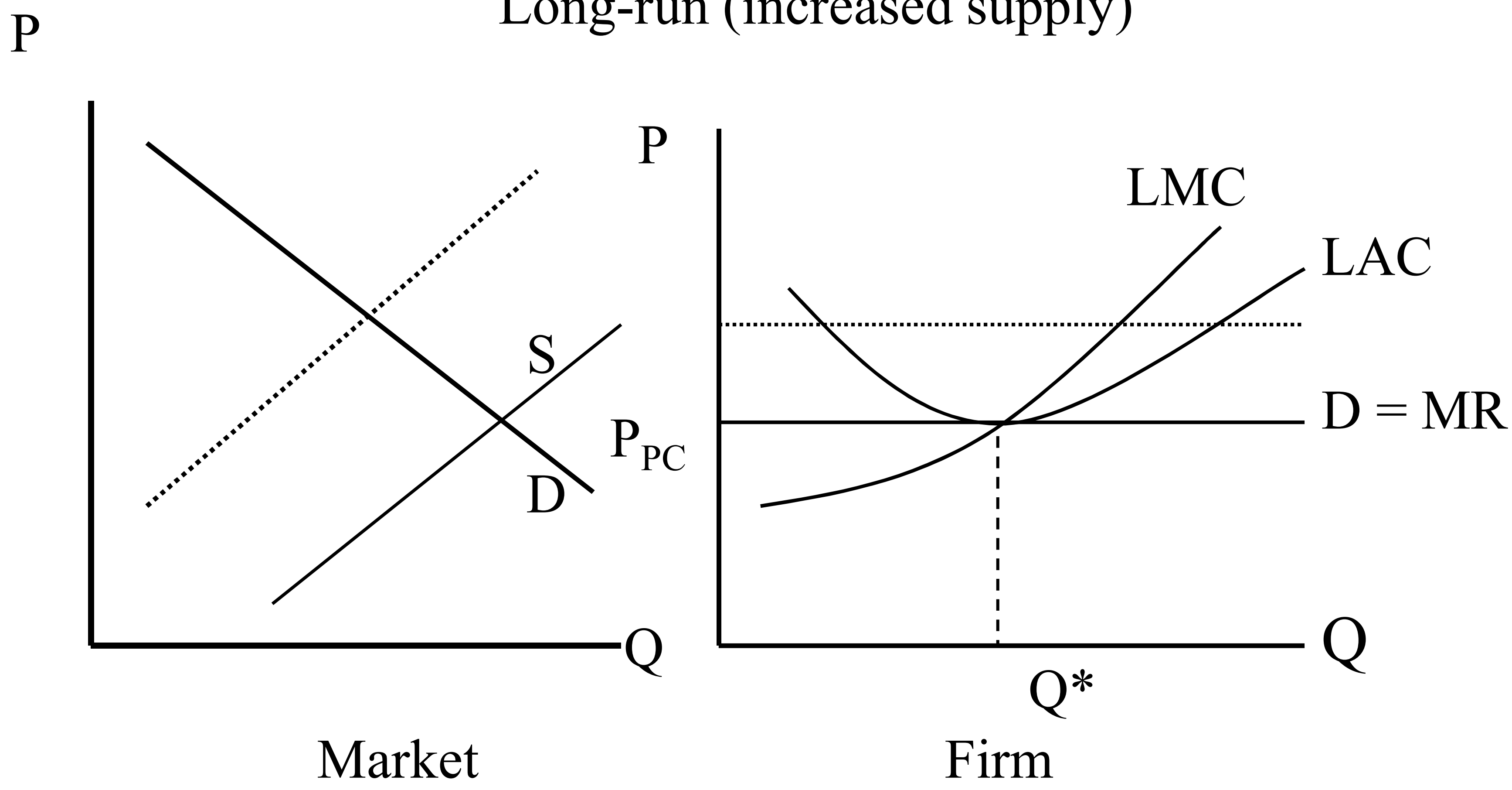
Market Eqilibrium



Firm's Profit Max

3. Market Structure: Perfect competition

Long-run (increased supply)



3. Market Structure: Monopoly

(ii) Monopoly

One firm

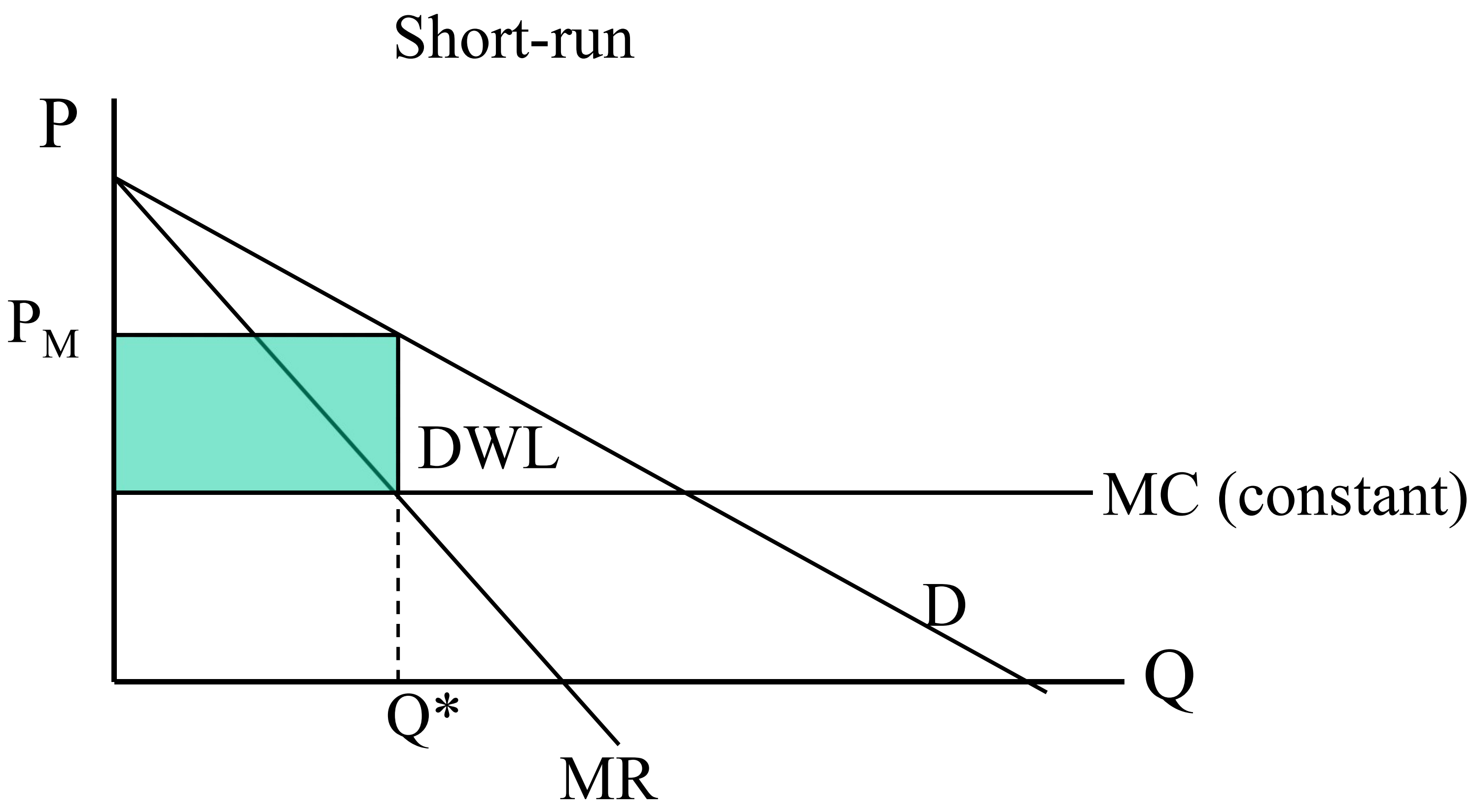
Barrier to entry

- Technology factor: patents
- Economic factor: cost advantage
- Regulation on natural resources

Discriminating and non-discriminating consumers

- Charge different prices

3. Market Structure: Monopoly



3. Market Structure: Monopoly

Long-run

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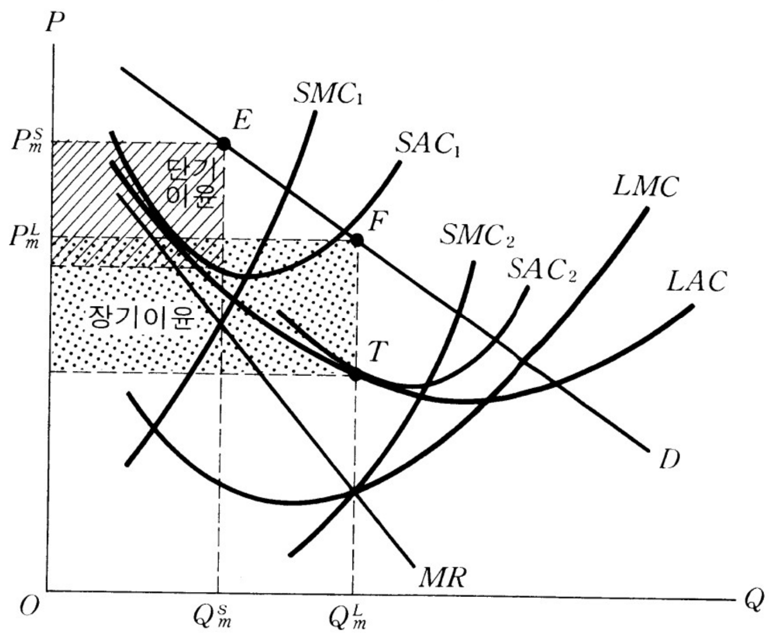


3. Market Structure: Oligopoly

(iii) Oligopoly

Small # of firms supply dominant share of industry output

Interdependence among decisions

- Competition and price
- Promotional strategy
- Innovation and technology
- Acquisitions and merges

3. Market Structure: Oligopoly

Game theory: How to tackle oligopoly?

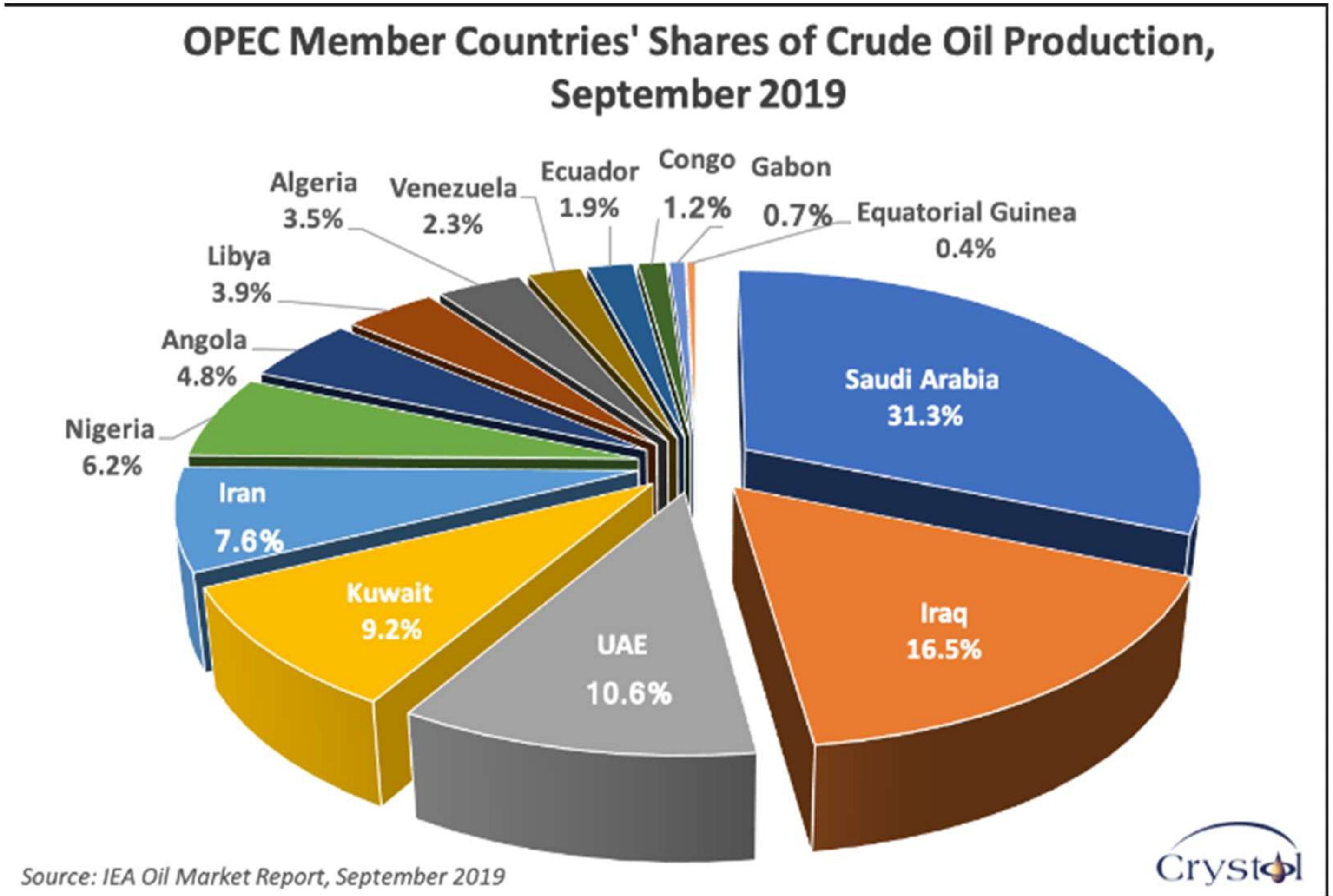
Interdependence affects market outcomes

Anticipate rival actions and responses

No neat equilibrium outcomes

Cooperative and non-cooperative

- Cartel: cooperative, work together, act like monopoly
  - ex: OPEC
- Duopoly price war: non-cooperative, perfect competition


OPEC Member Countries' Shares of Crude Oil Production, September 2019
Algeria 3.5%
Venezuela 2.3%
Ecuador 1.9%
Congo 1.2%
Gabon 0.7%
Equatorial Guinea 0.4%
Libya 3.9%
Angola 4.8%
Nigeria 6.2%
Iran 7.6%
Kuwait 9.2%
UAE 10.6%
Iraq 16.5%
Saudi Arabia 31.3%
Source: IEA Oil Market Report, September 2019
Crystol

3. Market Structure: Monopolistic competition

(iv) Monopolistic competition

Many sellers sell **differentiated** goods

Examples:

- The restaurant business
- Hotels and pubs
- toothpastes, toilet paper: producers practice product differentiation by altering the physical composition of products, using special packaging, or simply claiming to have superior products based on brand images or advertising.

3. Market Structure: Monopolistic competition

(iv) Monopolistic competition

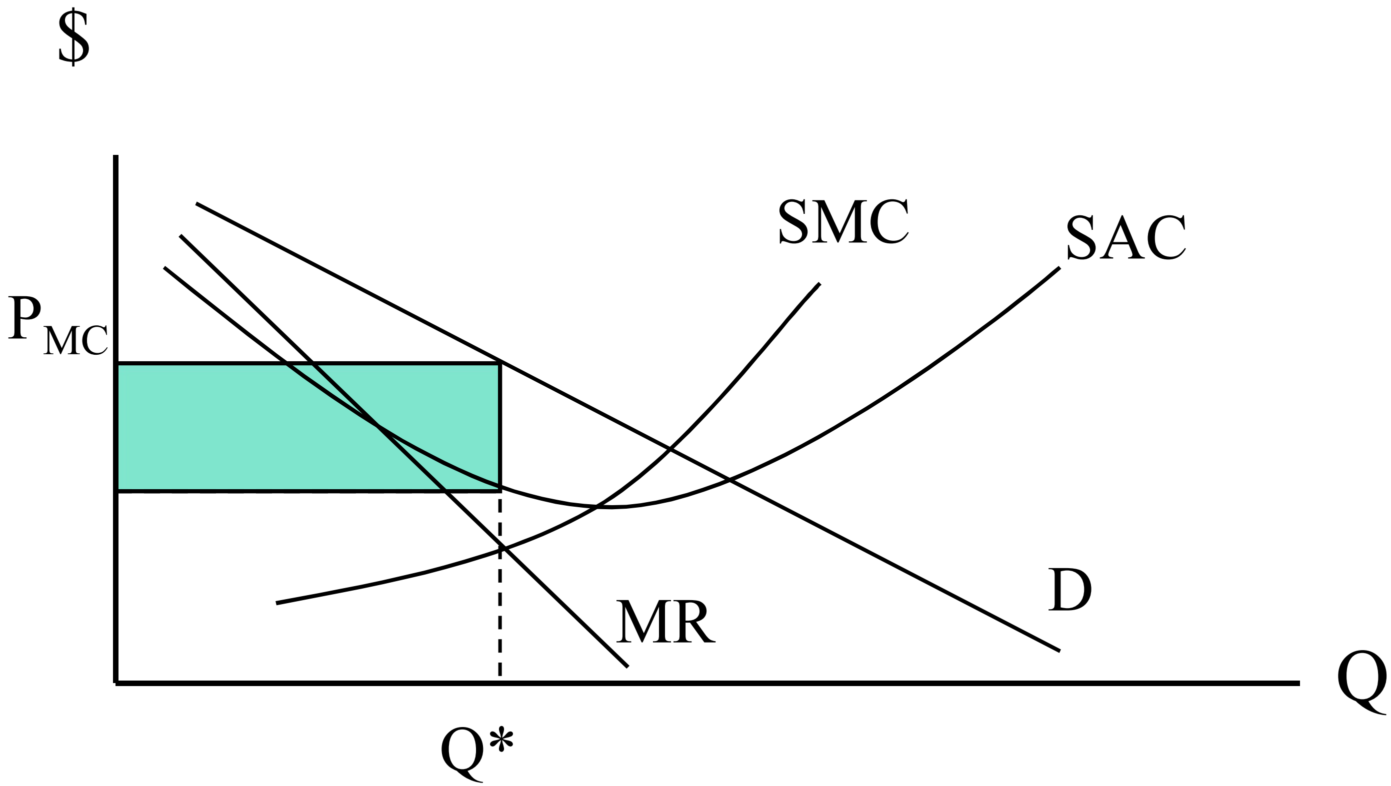
Each firm can influence sales

Actions have a small effect on rivals

Relatively costless market entry/exit

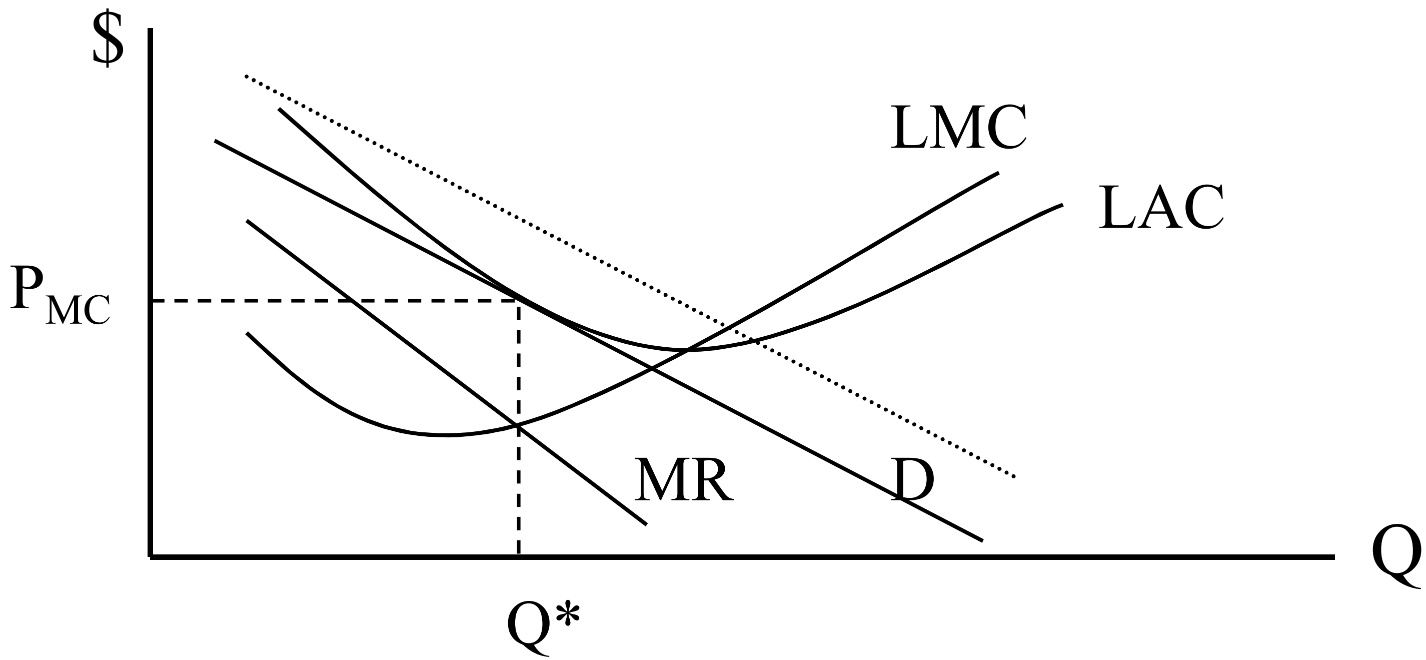
3. Market Structure: Monopolistic competition

Short-run by a firm



3. Market Structure: Monopolistic competition

Long-run by a firm



4. Industry Concentration and Conduct

(i) Industry concentration

$CR_4 = (q_1+q_2+q_3+q_4)/Q$

$CR_4 \rightarrow 0$: less concentrated market,
high competition

$CR_4 \rightarrow 1$: heavily concentrated market,
absence of competition

ISP Industry Concentration 1999-2000

ISP	ISP Market			IMTS Market
	US	UK	Australia	US
1	20.4	21.8	23.8	39.6
2	5.4	15.3	19.5	28.8
3	5.1	13.1	5.7	11.7
4	4.7	11.9	5.4	3.3
CR_4	32.6	62.1	54.4	83.4

KOREAN ISP Market

Operators	XDSL	Cable line	Apartment LAN	Satellite	Total	%
KT	4,109,724		556,780	6,150	4,852,654	45.8%
Hanaro Telecom	1,203,784	1,272,547	338,376		2,864,707	28.6%
Thrunet		1,298,348	8,832		1,307,180	13.1%
Onse Telecom		390,066	8,379		498,445	4.0%
Dreamline	86,200	87,001	3,302		176,503	1.8%
Dacom		68,214	79,360		147,574	1.5%
Value added	6,869	332,962	5,152		344,983	3.4%
Other Network	67,52		112,447		179,969	1.8%
Total	5,384,099	3,449,138	1,162,628	6,150	10,002,015	100%
%	53,8%	34.5%	11.6%	0.1%	100%	

(unit: subscribers, 2002. 9.)

– Ministry of Information and Communication http://www.mic.go.kr/

Access Price

Operators	XDSL	Cable line
KT	25,500 (2MB), 34,000 (8-10MB)	42,500 (8-10MB)
Hanaro Telecom	24,950 (2MB), 30,230 (8-10MB)	24,950(2MB),30,230 (8-10MB))
Thrunet		25,200 (2MB), 32,300 (8-10MB)
Onse Telecom		27,200 (2MB), 50,000 (8-10MB)
Dreamline	24,950(2MB), 30,230(8-10MB)	24,950 (2MB), 30,230 (8-10MB)
Dacom	28,000(2MB), 32,000(8-10MB)	28,000 (2MB), 34,000 (8-10MB)

(unit: Won, 2002. 9.)

- Ministry of Information and Communication http://www.mic.go.kr/

4. Industry Concentration and Conduct

Ex: $CR_4 = 60\ \%$

A	B
54%	15%
2	15
2	15
2	15

misleading CR_4

need further analysis: HHI

4. Industry Concentration and Conduct

Herfindal-Hishman Index

$HHI = S_1^2 + S_2^2 + S_3^2 + \ldots + S_n^2$

HHI adds more weight to higher market share S_i

HHI = 1: monopoly

Case A: Dominant 1st firm

Case B: Oligopoly

4. Industry Concentration and Conduct

(ii) Conduct (behavior and decision)

Market structure affects conduct

Lerner index is a measure of market power

Measure of market power

$L = (P-MC)/P$

$L \to 0$: competitive industry

$L \to 1$: monopoly type pricing

4. Industry Concentration and Conduct

(iii) Cost, Market structure and Conduct in the Information economy

Dominant firm/monopolization

- Low ACs are barrier to entry
- Repeat sales/One-Source Multi-Use: ‘Baywatch’, ‘Harry Potter’

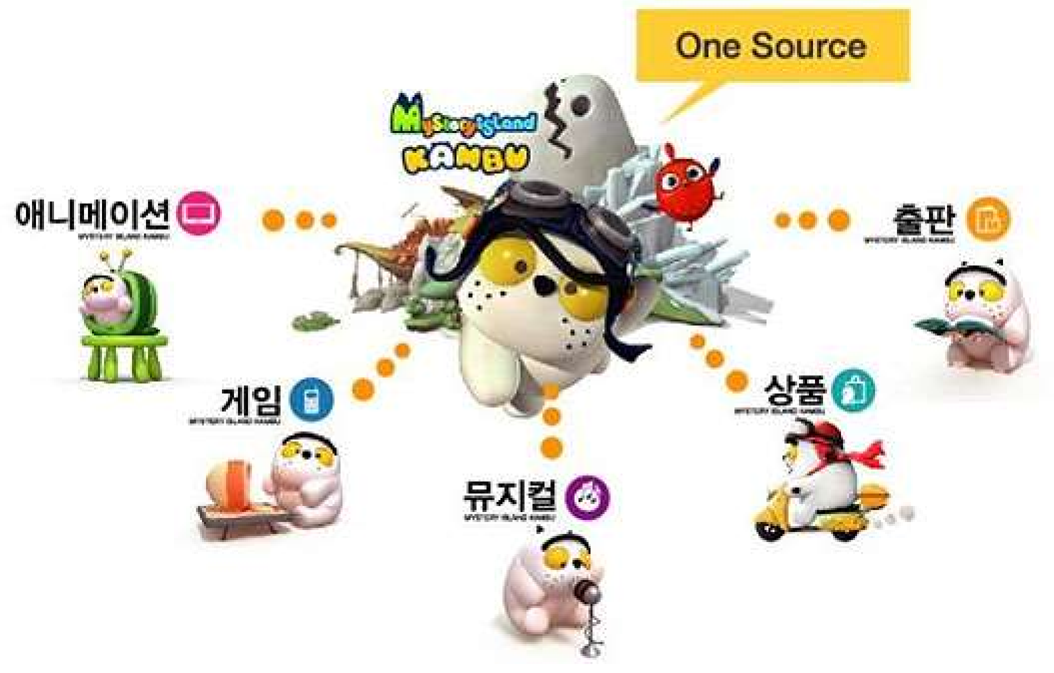
Differentiated product

- ‘add value’ to the information: superpages.com

First mover advantage

- Monopoly profits initially, Scale lowers AC
- Lock-in installed-base

4. Industry Concentration and Conduct



5. Pricing in Practice

(i) Cost-based pricing: mark up = (P-C)/C

(ii) Business pricing

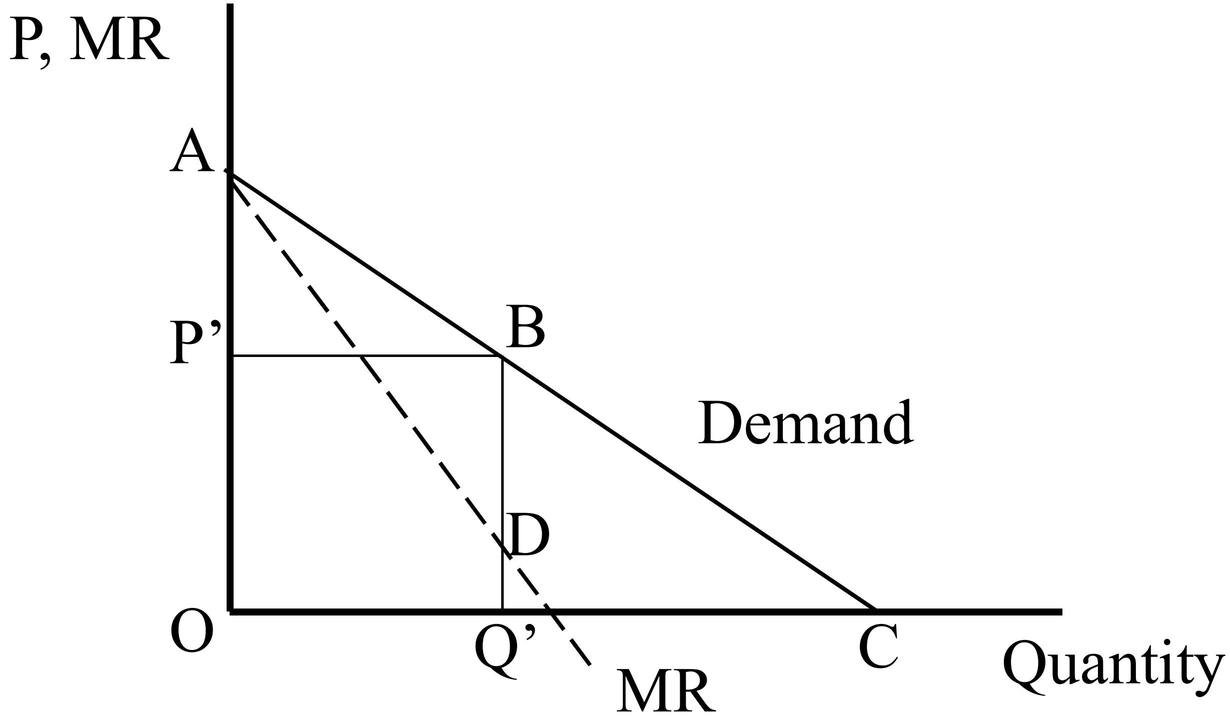
Reflects MC

Reflects price elasticity of demand

$P = MC/(1+1/\eta)$ reflects MR=MC

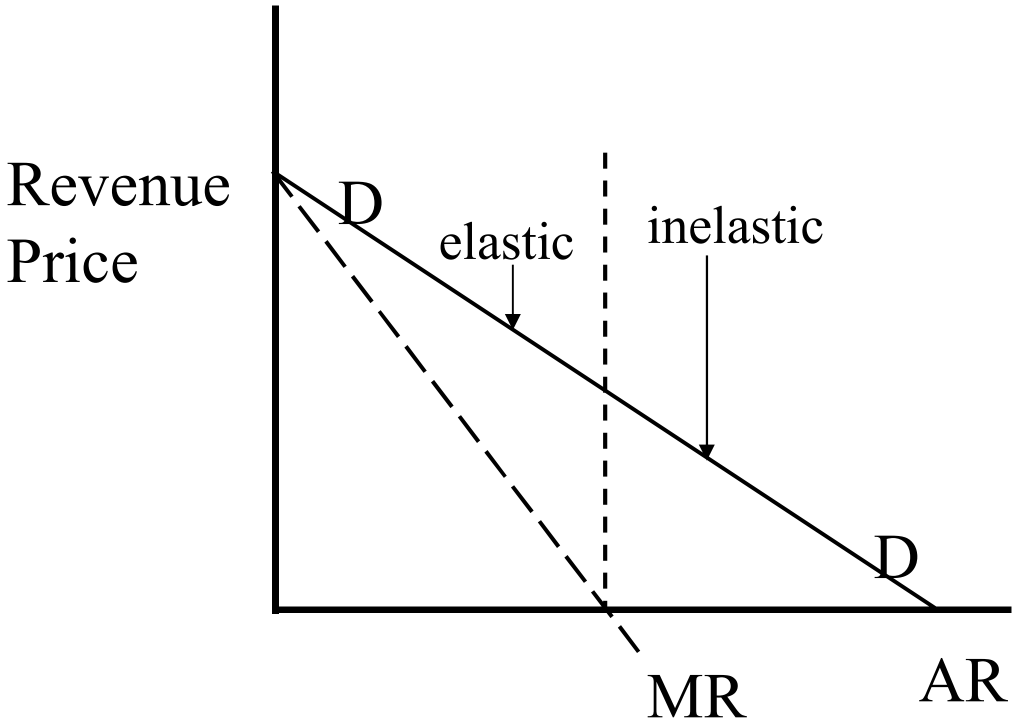
Note $P = MR/(1+1/\eta)$ (why?)

Price, Revenue and Elasticity



$$\eta_B = (dQ/dP)(P/Q) = -(BP'/AP')(OP'/BP')$$
$$= -BC/AB = -P/(P-MR)$$

Price, Revenue and Elasticity



5. Pricing in Practice

(iii) Dynamic pricing

Discriminate customer base

- Price according to WTP
- 1^{st} , 2^{nd} and 3^{rd} degree price discrimination

Charge fixed access fee for entry

- Plus per unit usage-based charge for each unit
- Good for natural monopoly markets
  - Use fixed fee to recover deficit from MC pricing
  - ex: memberships

5. Pricing in Practice

(iv) Penetration pricing

Low initial price gains quick penetration

Information, Internet and e-commerce

- To lock-in installed base of subscribers
- ‘tip’ the market (mileage, point, …)

Monopolization and switching costs

- Allow firm to raise price during growth stage

5. Pricing in Practice

(v) Bundling

Selling two or more goods together; software market, complimentary goods

Bundle price

(vi) Peak-load pricing

Inter-temporal price discrimination

Telecom, Internet, water, electricity, etc

MCs higher during peaks

Charge higher price during peaks

5. Pricing in Practice

(vii) Cross-subsidization

Products may be inter-related

- Cost or demand

↓ Price for one good, ↑ Price for another

Loss-leader

- Leader product to attract customer
- Other products with high price

OS (low price) and applications software (high price)

5. Pricing in Practice

(viii) Price skimming

High initial price for new good

Progressive lowering of price as market matures

Maximize short-term profits

Electronic goods market

ex: HDTV, LCD monitor

6. Network Interconnection and Standards

Network externality occurs for existing users of the network as the value of the network increases with addition of new subscribers

6. Network Interconnection and Standards

(i) Interconnection and standards

Consumers want to be connected to large network

When there are multiple providers of networks and network services

- Advantage to consumers if they interconnect
- Interconnection and standardization is an important strategic decision for the firm

6. Network Interconnection and Standards

(ii) Dominant firm

Telephony, fax, email, Internet, P2P

Dominant firms don't like to interconnect

- Bell system, 1890s
- Telecom and Electricity, late 1990s
- Ford, 1910s: standardization of parts of Auto
- MS and AOL, today

6. Network Interconnection and Standards

(iii) Sharing latent value

Interconnection increases value of the network

Share increases value to all

Welfare can be increased

- In free market, private interconnection agreement
- In regulated market, rules enforce agreement

6. Network Interconnection and Standards

Pareto efficient improvement increases the welfare

- Firms better off w/o consumers worse off
- Consumers better off w/o firms worse off

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