Economic Analysis in Merger Investigation

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Outline

- *Introduction*
- *Market Definition*
- *Failing Company*
- *Competitive Assessment*

30 minutes presentation
By Koki Arai, JFTC&CPRC

Outline

- *Introduction*
- *Market Definition*
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M&A Regulation in Japan and Russia
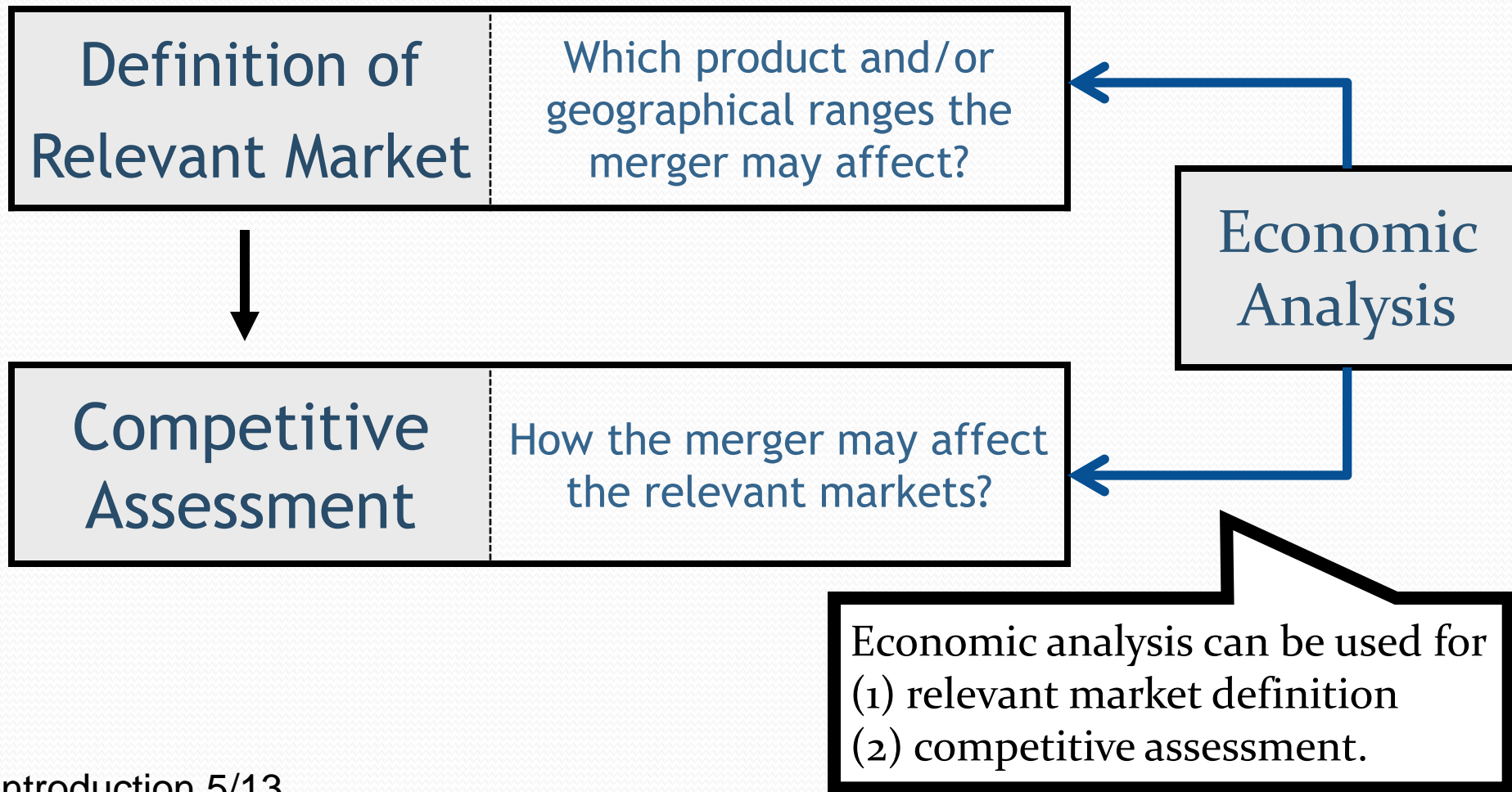
Anti-monopoly Act in Japan

§15　M&As are prohibited if they may cause <u>a substantial restraint of competition</u> in a particular field of trade

In Japan, (1) define the relevant markets, and
(2) examine whether the said merger may cause a substantial restraint of competition (competitive assessment)

Federal Law No. 135-FZ on the Protection of Competition, Russia

§18　The federal anti-monopoly body is entitled to dismiss the application for a preliminary consent to the implementation of the deals specified in Article 16 of the present Federal Law if the satisfaction of the application could lead to the occurrence or enhancement of a dominating position of the parties to the deals and to the limitation of competition on the financial services market. ...

The Role of Economic Analysis for M&A investigation in Japan

Definition of Relevant Market	Which product and/or geographical ranges the merger may affect?

Economic Analysis

Competitive Assessment	How the merger may affect the relevant markets?

Economic analysis can be used for
(1) relevant market definition
(2) competitive assessment.

The Types of Economic Analysis

There are various types of economic analysis

1. From quite simple analysis (e.g. calculation of price correlation coefficients) to technically demanding analysis (e.g. merger simulation)

2. From analysis that can be complemented with small set of data to the one that needs large set of data

➡ *We have to consider which economic analyses can be used, subject to our ability to conduct analysis and the data obtained.*

Examples of Economic Analyses

Examples of economic analysis for market definition

    Price Correlation analysis
    Stationarity analysis
    Switching analysis
    Elzinga-Hogarty test
    Price elasticity analysis
    Critical loss analysis
    Critical elasticity analysis

Examples of economic analysis for competitive assessment

    Calculation of market share, concentration ratio or HHI
    Event analysis
    Natural experiment
    Merger Simulation

Relevant Market Definition

Market Definition

- Competition authorities must define relevant markets before progressing to evaluate competitive effects. Market share or concentration thresholds are used to define safe harbors.
- Competition authorities often undertake a market definition exercise as the first step in an investigation since firms' market shares are used as first screening device to give the investigator a first hint of the likelihood of a potential problem.

Markets and Market Power

- Relevant Market definition is closely related to market power.
- Market power means the ability of a firm to raise the price of its products above the competitive level.
- The main factor that limits market power is the demand substitutability.

Introduction 8/13

Economic Theory of Merger

Analyzing Effects of Mergers with an Oligopoly Model

The oligopoly model suggests that <u>a merger raises the market price</u>, <u>reduces the output and profits of merging firms (but may increase the profit rate), and increases the profits of non-merging firms</u>. The social welfare is hurt.

- The results may change when the merger contributes to efficiency increase and thereby reduces the merging firm's marginal cost.

- See Farrell and Shapiro (1990)

Economic Theory of Merger
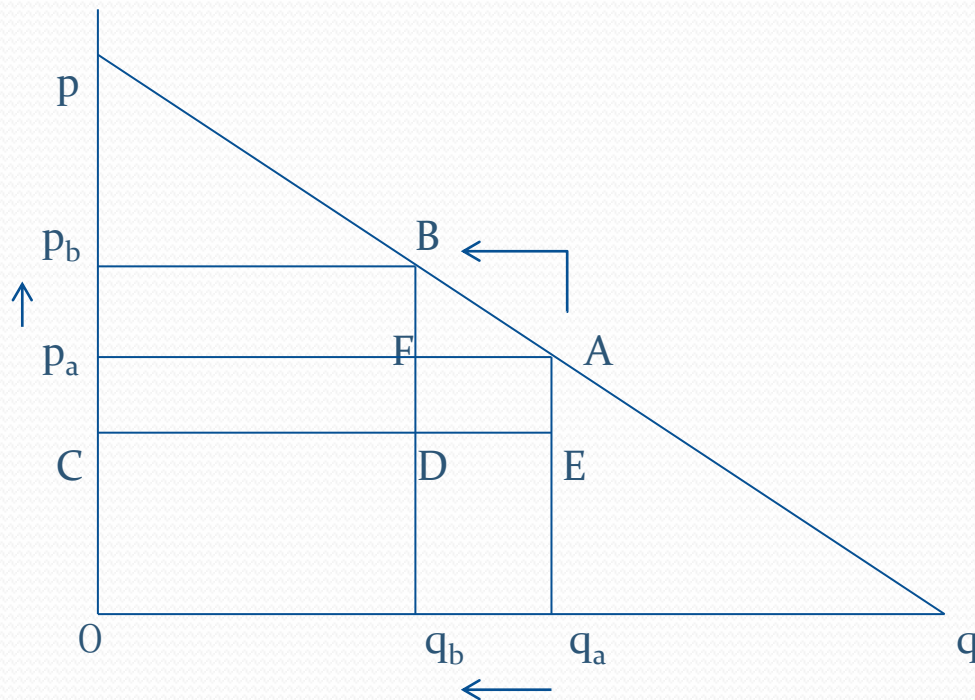
Analyzing Effects of Mergers with an Oligopoly Model

Welfare Changes
-before merger
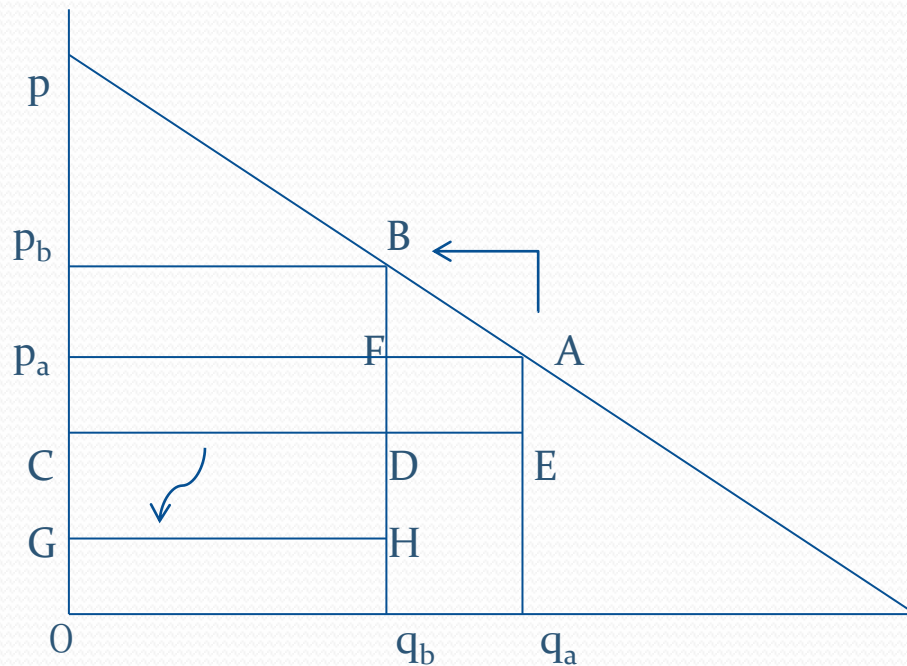Consumer surplus: $\triangle pAp_a$
 Producer surplus: $\square p_aAEC$

-after merger
Consumer surplus: $\triangle pBp_b$
Producer surplus: $\square p_bBDC$

Economic Theory of Merger

Analyzing Effects of Mergers with an Oligopoly Model

Welfare Changes
-before merger
Consumer surplus: $\triangle pAp_a$
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-after merger
Consumer surplus: $\triangle pBp_b$
Producer surplus: $\square p_bBDC$

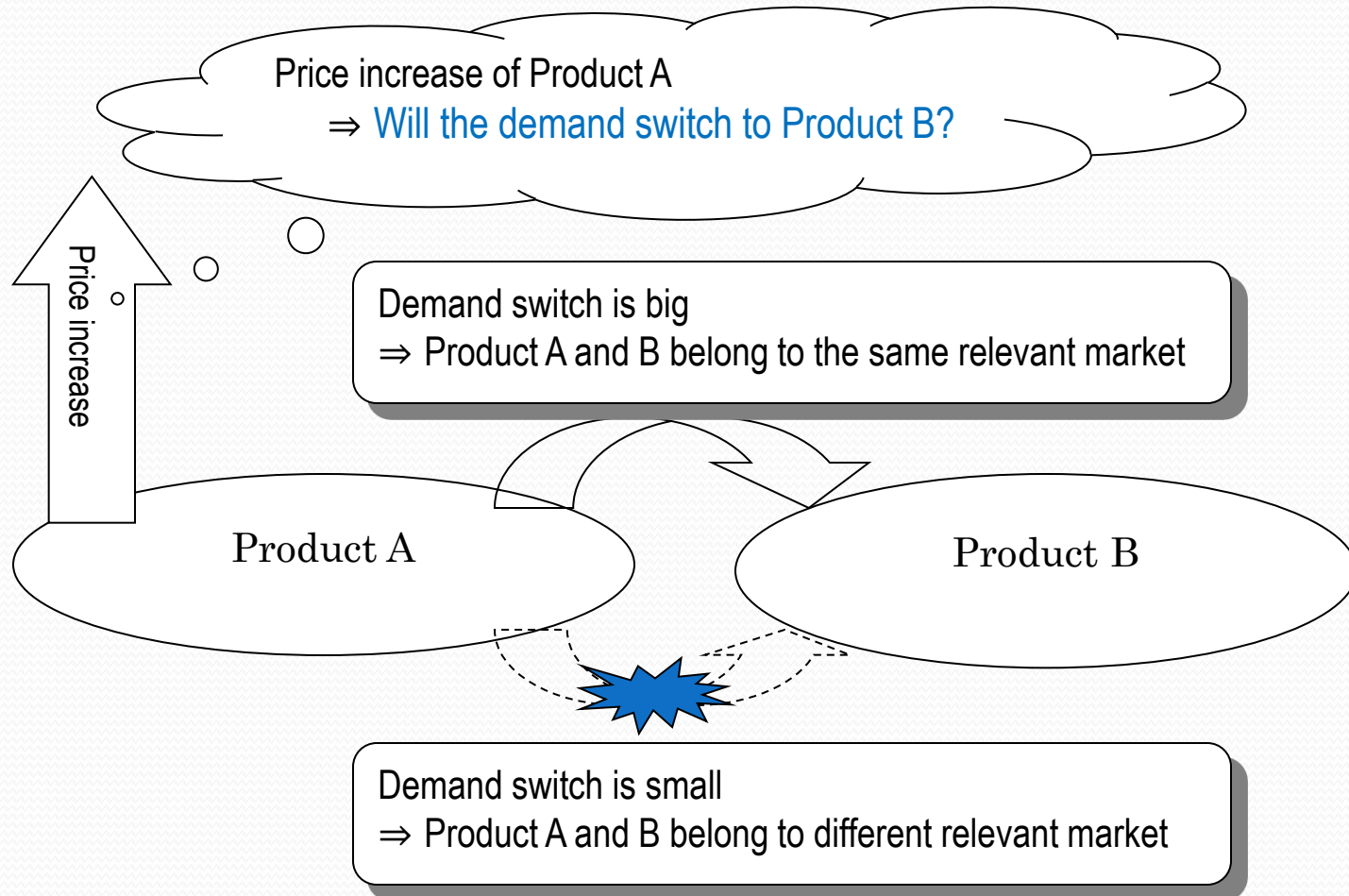*If the marginal cost CD→GH

(efficiency case)
Producer surplus: $\square p_bBHG$

Economic Theory of Merger

Effects of Efficiency Increase on Mergers

Efficiency increase	Case 1 Zero or small	Case 2 Large	Case 3 Larger	Case 4 Very large
Price		$\Uparrow$		$\Downarrow$
Merging firms' profits	$\Downarrow$	$\Uparrow$		
Consumer welfare		$\Downarrow$		$\Uparrow$
Social welfare		$\Downarrow$	$\Uparrow$	

Substitutability and Relevant Market

Price increase of Product A
⇒ Will the demand switch to Product B?

Price increase

Demand switch is big
⇒ Product A and B belong to the same relevant market

Product A

Product B

Demand switch is small
⇒ Product A and B belong to different relevant market

Introduction 13/13

Outline

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Method to define the Relevant Market in Japan and in Taiwan

Japan (M&A Guidelines)

The relevant markets are in principle defined in term of <u>substitutability</u> for users.

In examining substitutability for users, the concept of SSNIP test will be applied.

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Guidelines to Application of the Antimonopoly Act Concerning Review of Business Combination (2004, revised 2011)

Part II. A Particular Field of Trade (M&A Guidelines)

A particular field of trade denotes the scope for determining whether the effect of the business combination may be to restrain competition, and is determined, in principle, in terms of <u>substitutability for users,</u> such as the product range that is the subject of a particular trade and the range of trading areas.

Further, <u>when necessary, substitutability for suppliers</u> is also considered.

Guidelines to Application of the Antimonopoly Act Concerning Review of Business Combination (2004, revised 2011)

Part II. A Particular Field of Trade (M&A Guidelines)

(SSNIP TEST)
When examining substitutability for users, the JFTC will suppose that a specific product is supplied by a monopolist in a specific region.
Then, under this assumption, it considers the degree to which users can substitute an alternative product or region for the purchase of the product when *a small but significant and non-transitory increase in price* (Note 2) is implemented by the monopolist with the aim of maximizing profit.

Market Definition 17/28

Guidelines to Application of the Antimonopoly Act Concerning Review of Business Combination (2004, revised 2011)

Part II. A Particular Field of Trade (M&A Guidelines)

(SSNIP TEST)
If the degree to which an alternative product or region can be substituted for the purchase of the product is <u>small</u>, and the <u>monopolist succeeds in expanding its profits from the price increase</u>, the scope can be defined as denoting that the effect of the business combination may have some impact on competition.

Guidelines to Application of the Antimonopoly Act Concerning Review of Business Combination (2004, revised 2011)

Part II. A Particular Field of Trade (M&A Guidelines)

(SSNIP TEST)
Regarding substitutability for suppliers, the JFTC will consider the degree to which <u>other suppliers can switch, within a relatively short period of time (mostly within a year),</u> without substantial cost or risk, from the manufacture and sale of another product or region to those of the product, if a small but significant and non-transitory increase in price is implemented for the product and region

Market Definition 19/28

Guidelines to Application of the Antimonopoly Act Concerning Review of Business Combination (2004, revised 2011)
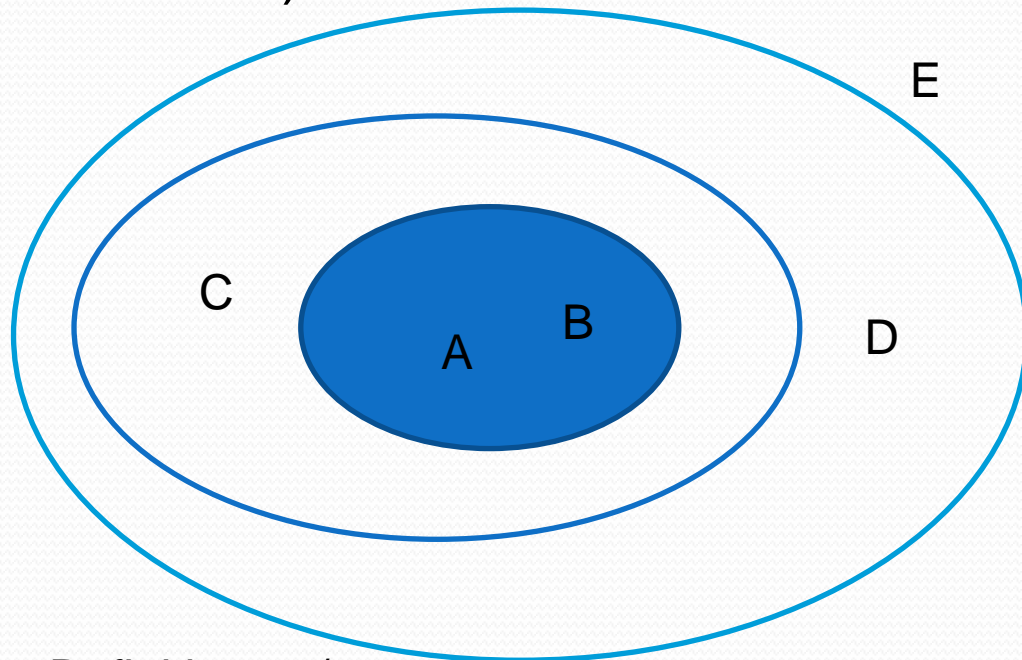
Part II. A Particular Field of Trade (M&A Guidelines)

(SSNIP TEST)
(Note 2) A "small but significant and non-transitory increase in price" is generally a price increase of between 5% and 10% that persists for about a year. However, these figures should only be used as a guide, and should be considered individually for each case.

Market Definition 20/28

Guidelines to Application of the Antimonopoly Act Concerning Review of Business Combination (2004, revised 2011)

Part II. A Particular Field of Trade (M&A Guidelines)
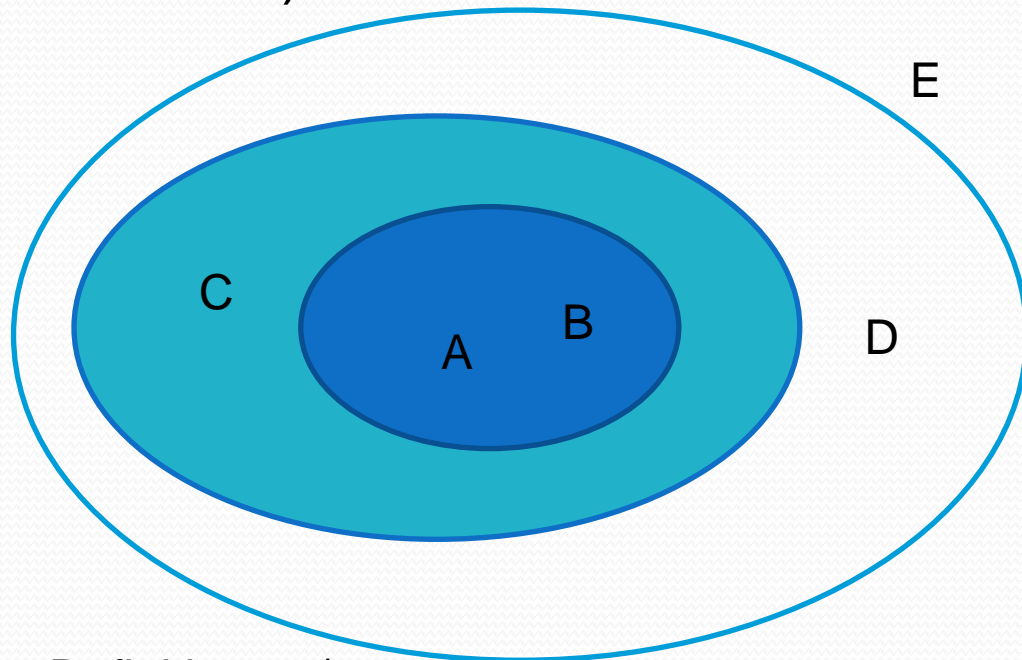
(SSNIP TEST)

a price increase of between 5% and 10%

If (A+B) are 5% up, then a consumer goes to C. → Market (A+B) should be added to C.

Guidelines to Application of the Antimonopoly Act Concerning Review of Business Combination (2004, revised 2011)

Part II. A Particular Field of Trade (M&A Guidelines)

(SSNIP TEST)

E

C

A   B

D

a price increase of between 5% and 10%

If (A+B+C) are 5% up, then a consumer goes to D.
→ Market (A+B+C) should be added to D.

Market Definition 22/28

Guidelines to Application of the Antimonopoly Act Concerning Review of Business Combination (2004, revised 2011)

Part II. A Particular Field of Trade (M&A Guidelines)
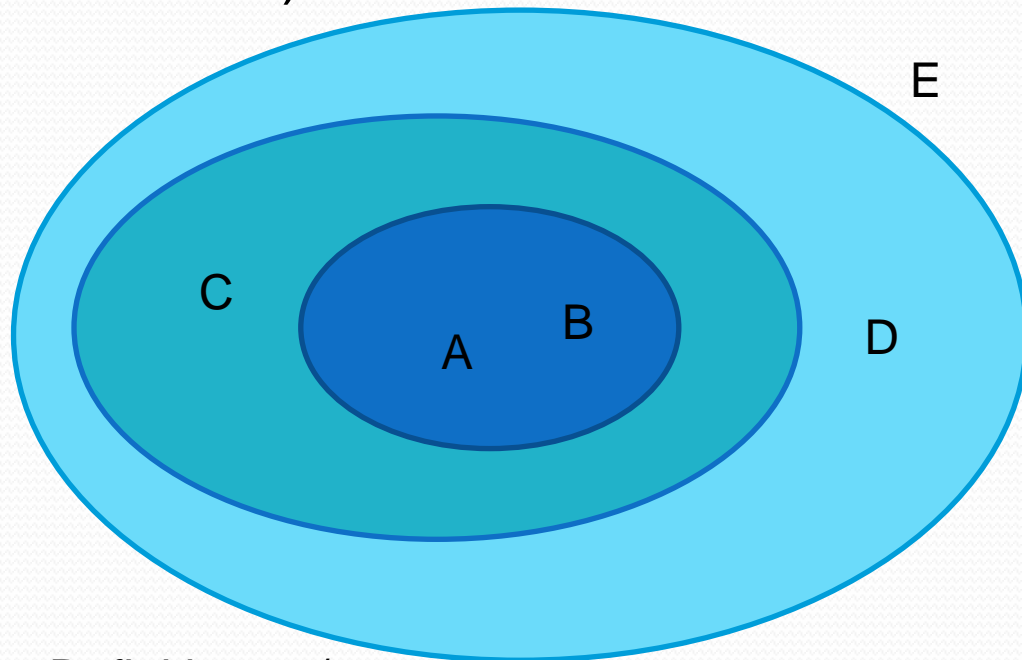
(SSNIP TEST)

E

a price increase of between 5% and 10%

C

B

A

D

If (A+B+C+D) are 5% up, then a consumer does NOT goes to E.
→ Market (A+B+C+D) is the relevant market.

Guidelines to Application of the Antimonopoly Act Concerning Review of Business Combination (2004, revised 2011)

Part II. A Particular Field of Trade (M&A Guidelines)

(2. Product Range)
The product range is defined by the perspective of product substitutability for users. The degree of product substitutability very often matches the degree of similarity of utility for users, so that the latter criterion can often be applied to determine the degree of product substitutability.

Market Definition 24/28

Guidelines to Application of the Antimonopoly Act Concerning Review of Business Combination (2004, revised 2011)

Part II. A Particular Field of Trade (M&A Guidelines)

(2. Product Range)

When assessing the degree of similarity of a product's utility for users, the following criterion will be considered.

(1) Usage

(2) Changes in Price, Quantity, etc.

(3) Recognition and Actions of Users

Market Definition 25/28

Guidelines to Application of the Antimonopoly Act Concerning Review of Business Combination (2004, revised 2011)

Part II. A Particular Field of Trade (M&A Guidelines)

(3. Geographic range)

The geographic range, as well as the product range, is also determined from the perspective of substitutability for users between the products supplied in each area.

The degree of substitutability between the products supplied in each area can very often be determined by the behavior of users and suppliers, and the existence of issues in the transportation of the product.

Market Definition 26/28

Guidelines to Application of the Antimonopoly Act Concerning Review of Business Combination (2004, revised 2011)

Part II. A Particular Field of Trade (M&A Guidelines)

(3. Geographic range)

To assess the behavior of users and suppliers and the existence of problems regarding the transportation of the product, the following factors are considered.

A. Business Area of Suppliers, the Area for Users to Purchase, etc.

B. Features of Goods

C. Type or Cost of Transportation

Market Definition 27/28

Part II. A Particular Field of Trade (M&A Guidelines)

(3. Geographic range)
(2) The concept in case geographical range is determined across borders
The basic concept in (1) described above will also apply when crossing borders. That is to say that if users, both inside and outside Japan for a certain product are <u>conducting business without segregating domestic and foreign suppliers</u>, even if the prices have been raised in Japan, the users in Japan will be able to substitute the purchase of products from overseas suppliers, which may obstruct the raising of prices in Japan. In that case, a geographical range has been determined across the border.
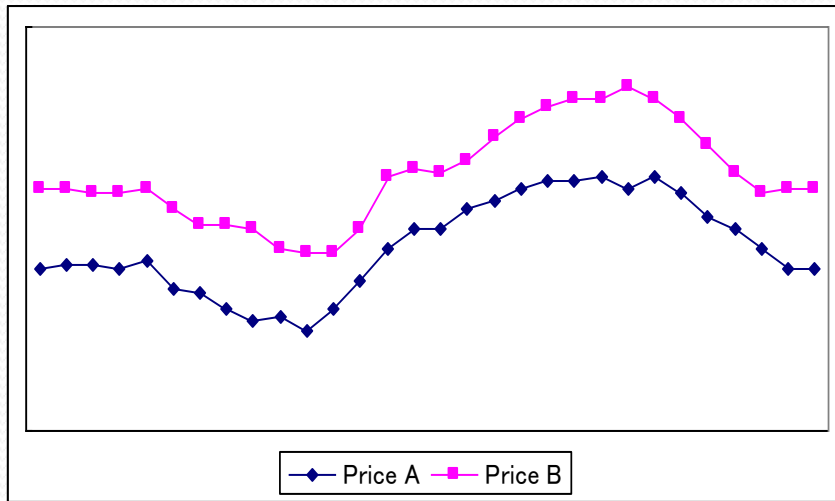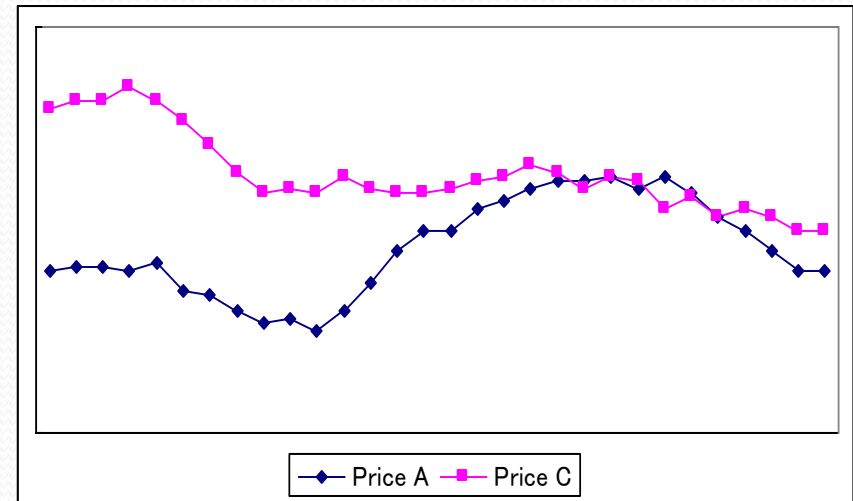
Market Definition 28/28

Price Correlation Analysis

Examine the trend of prices of two goods

The prices change in the same way.	The prices change differently.

→ Two products may be in the same market

How can we quantify the extent of similarity of two prices movements?
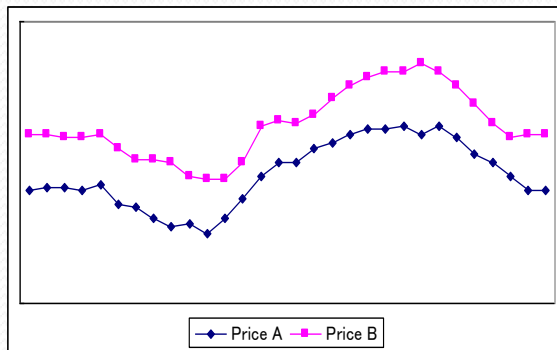→Correlation coefficient
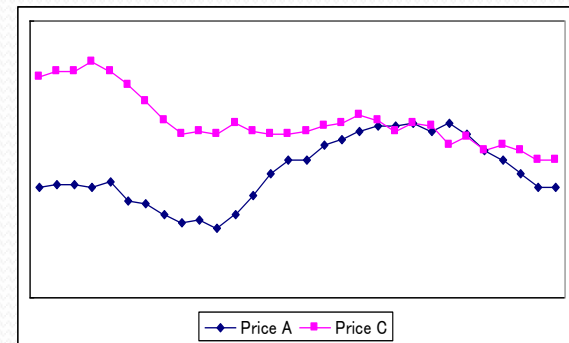
Price Correlation Analysis

Price correlation coefficient measures the extent to which the prices move together over time.

The correlation coefficient is a number ranging from between –1 and 1.

- A coefficient of 1 → perfect positive correlation.

- A coefficient of –1 → perfect negative correlation.

- A coefficient of zero → no correlation.

The Price Correlation Coefficient is 0.97.

The Price Correlation Coefficient is – 0.20

30

Interpretation of Correlation Coefficient

- Price correlation coefficient is positive and near 1

  <Some possible interpretations>

  (1) demand side factor
    - Two products are close substitute (which means that two products are in the same market)
      ➡ If price of A rises, buyers of A will switch to B and price of B will also rise.
    - Two products are close complement

      If price of A rises due to the boom of goods A, price of complementary goods B will also rise due to the increase of demand

  (2) Supply side factor
    - Two products are made of the same materials.

      When goods A and goods B are made of the same materials (say, petroleum), if price of the materials rises, price of A and B may rise similarly due to the change of the price of the materials.

  How can we know which interpretations are correct?

Interpretation of Correlation Coefficient

- How can we know which interpretations are correct?
  ➡ There is no concrete way to distinguish among them.
  Just use other information and common sense.

- Price correlation coefficient is near 0
  ➡ Two products are considered not to be in the same market.

  ex. Nestle / Perrier case
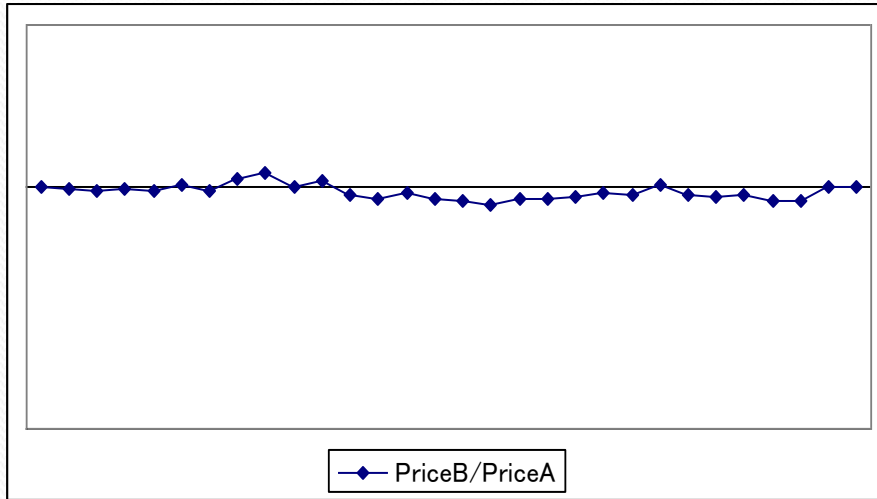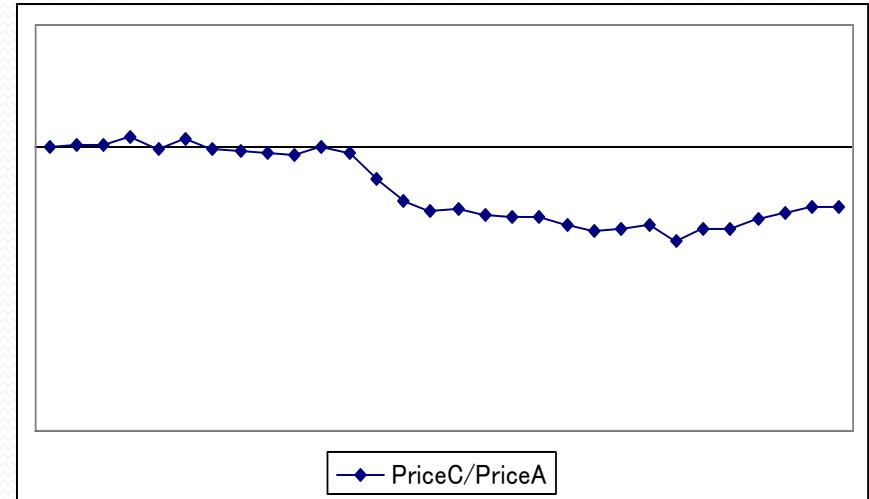
Stationary Analysis

Examine the trend of relative price of two goods

The relative price is "stationary" over time.	The relative price is going down as time goes by.

PriceB/PriceA

PriceC/PriceA

How can we judge whether the relative price is stationary or not?
→Cointegration Analysis

Switching Analysis

The market share of a product is negatively related to that of another product
$\rightarrow$ The two products may be substitutable and in the same market

	Product A	Product B	Product C
Period 1	70	25	5
Period 2	69	18	13
Period 3	68	14	18

As C's market share increases, B's market share decreases significantly, whereas A's market share does not change much.

$\rightarrow$ <u>C & B</u> may be more substitutable than <u>C & A</u>.

Switching Analysis: Caveats

- Even if the market shares are not negatively related, the products could be substitutable and be in the same market.
  - Difference in quality, price, and the timing of new product among firms, the possibility of collusions, etc. may influence the market share trends.
- *Diversion ratio* is often used to measure of the level of brand switching.

$$\text{Diversion ratio (from product A to B)} = \left| \frac{\Delta Q_B}{\Delta Q_A} \right| \quad \text{when the price of A increases}$$

Elzinga-Hogarty Test (EH Test)

Elzinga-Hogarty Test is used for the definition of geographic market

Area in question

Other Area

Seller

Buyer

Seller

Buyer

α

β

γ
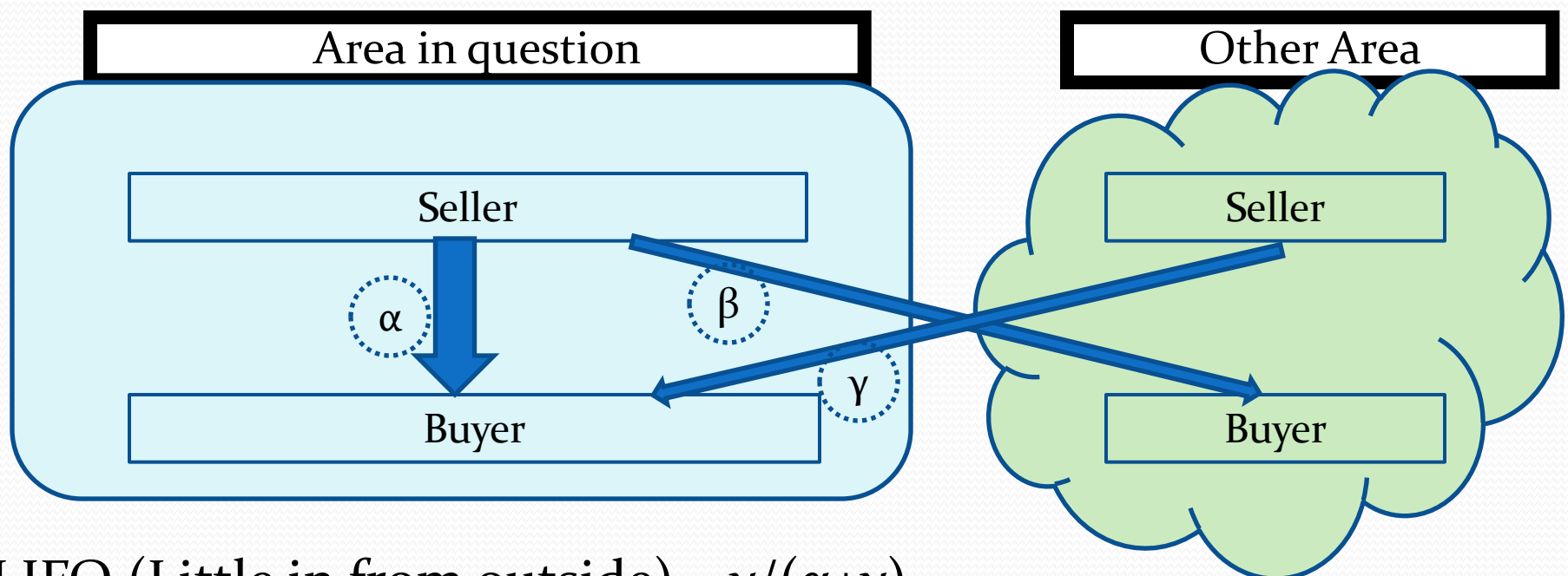
LIFO (Little in from outside) = $\gamma/(\alpha+\gamma)$

LOFI (Little out from inside) = $\beta/(\alpha+\beta)$

Both LIFO and LOFI is below 0.25 $\longrightarrow$ Area in question constitutes a relevant market

EH test was often used for M&A cases of hospitals in 1990s in the US.

Price Elasticity (1)

Price elasticity of market demand = percentage change in quantity demanded in response to 1 percentage increase in market price.

$$\varepsilon_{ii} = \left| \frac{\dfrac{\text{the change in quantity demanded}}{\text{the initial quantity demanded}}}{\dfrac{\text{the change in price}}{\text{the initial price}}} \right| = \left| \frac{\dfrac{\Delta D_i}{D}}{\dfrac{\Delta P_i}{P_i}} \right|$$

- To estimate the elasticity, econometric analysis with the detailed data is generally required (estimate a demand curve from a large set of data of price and quantity)

Price Elasticity (2)

Example

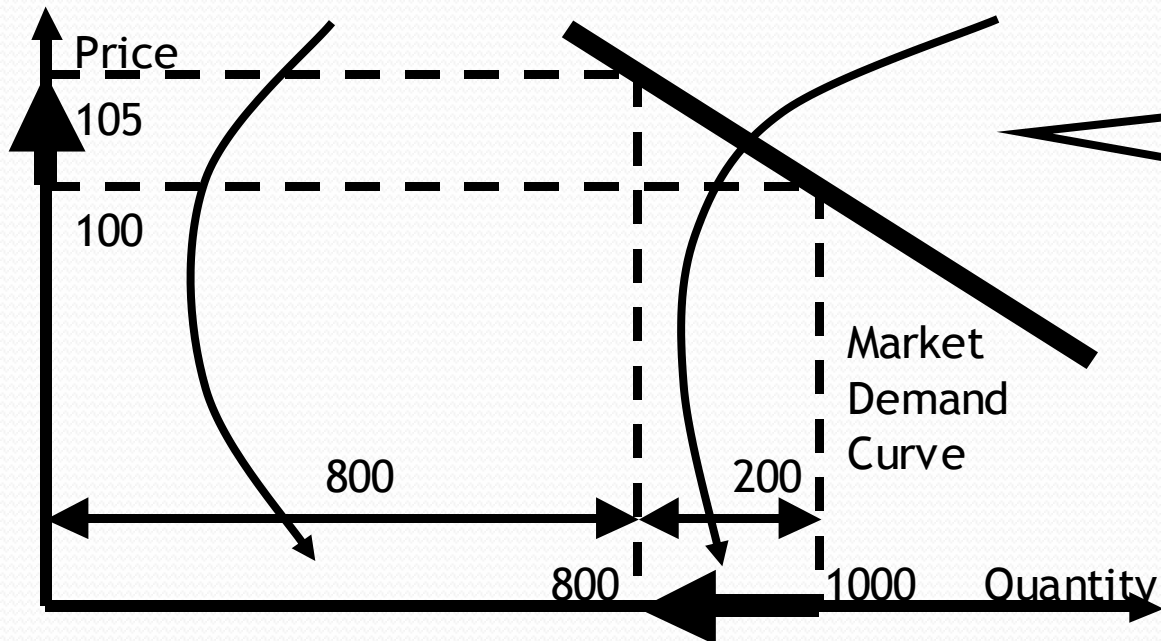| Inframarginal consumers: consumers not switching in response to (a given) price change | + | Marginal consumers: consumers switching in response to (a given) price change | = | Total consumers |

Price

105

100

20% of consumers would switch in response to 5% price increase

Market Demand Curve

800

200

800

1000   Quantity

$$\varepsilon_{ii} = \left| \frac{-200/1000}{5/100} \right| = 4$$

Features of Price Elasticity

- The value of the price elasticity (ε) is usually getting smaller as the market is getting wider (because the number of substitutable goods is getting few).

<Example: Market of car>

- Price elasticity (ε) of Collora should be very big (if the price of Collora increases, so many consumers will switch to other Toyota cars and other automakers' cars).
- Price elasticity (ε) of Toyota cars should be big but not so big as Collora (if the price of Toyota cars increases, many consumers switch to other automakers' cars).

➡ ε of Collora > ε of Toyota cars > ε of Japanese cars > ε of cars > ε of cars and trucks > ε of cars, trucks and buses

Price Elasticity Analysis (1)

Example 1 : Market for Toyota cars
Many consumers would switch in response to a given price change
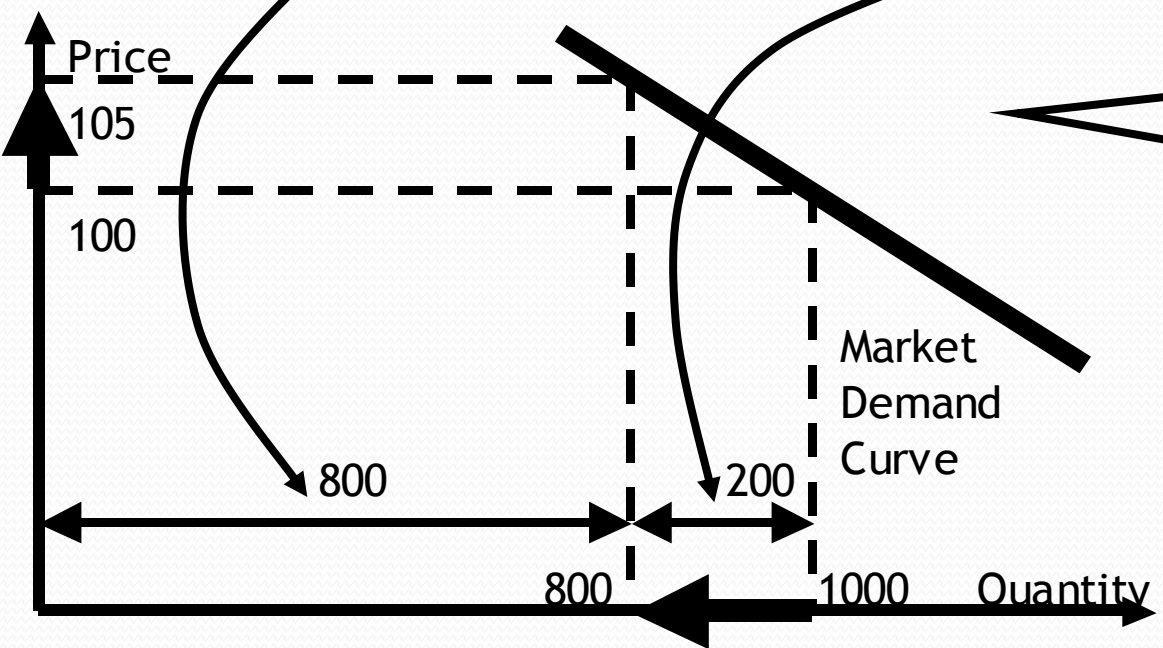
| Inframarginal consumers: consumers not switching in response to (a given) price change | + | Marginal consumers: consumers switching in response to (a given) price change | = | Total consumers |

Price

105

100

20% of consumers would switch in response to 5% price increase

Market Demand Curve

800

200

800

1000   Quantity

40
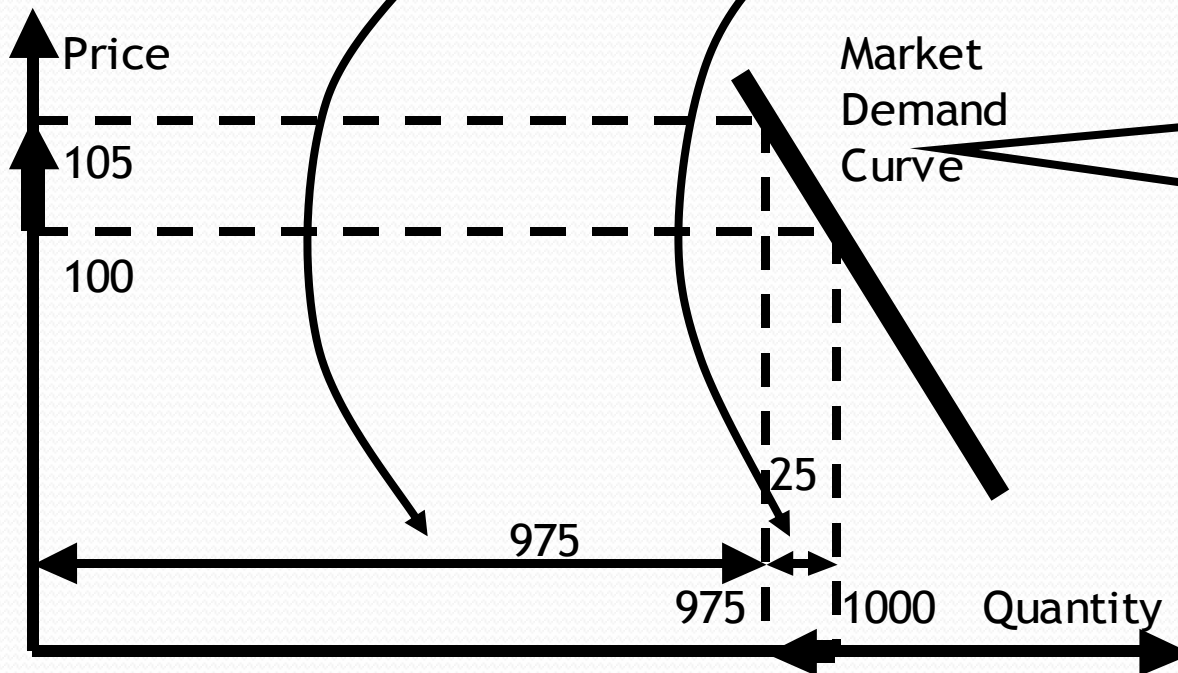
Price Elasticity Analysis (2)

Example 2 : Market for cars and trucks
Few consumers would switch in response to a given price changes

| Inframarginal consumers | **+** | Marginal consumers | **=** | Total consumers |

Price

105

100

Market
Demand
Curve

2.5% of consumers would switch in response to 5% price increase

25

975

975   1000   Quantity

41

Price Elasticity Analysis (3)

Price elasticity of market demand = percentage change in quantity demanded in response to 1 percentage increase in market price.

- If the elasticity is large, the market may be wider.
- If the elasticity is small, the market may be narrower.

$$\varepsilon_{ii} = \left| \frac{\dfrac{the\ change\ in\ quantity\ demanded}{the\ initial\ quantity\ demanded}}{\dfrac{the\ change\ in\ price}{the\ initial\ price}} \right| = \left| \frac{\dfrac{\Delta D_i}{D_i}}{\dfrac{\Delta P_i}{P_i}} \right|$$

Example 1

$$\varepsilon_{ii} = \left| \frac{-200/1000}{5/100} \right| = 4$$

Example 2

$$\varepsilon_{ii} = \left| \frac{-25/1000}{5/100} \right| = 0.5$$

Which value of the elasticity should be a threshold to judge whether market may be wider or narrower?

Price Elasticity Analysis: Caveats

- In order to identify the relevant market range rigidly, SSNIP test should be applied. SSNIP test requires the data not only of the level of elasticity but also of marginal cost.
  $\rightarrow$ *Critical Elasticity Analysis, Critical Loss Analysis*

Critical Elasticity Analysis / Critical Loss Analysis

Critical Elasticity Analysis/ Critical Loss Analysis is often used for relevant market definition as a practical implementation of the *SSNIP (Small but Significant and Non-transitory Increase in Price) Test*.

<SSNIP Test (Horizontal Merger Guidelines in the US)>
A market is defined as a product or group of products and a geographic area in which it is produced or sold such that <u>a hypothetical profit-maximizing firm</u>, not subject to price regulation, <u>that was the only present and future producer or seller</u> of those products in that area <u>likely would impose at least a "small but significant and nontransitory" increase in price</u>, assuming the terms of sale of all other products are held constant.

SSNIP Test

The SSNIP Test:
The price rise (say, 5%) by the hypothetical monopolist (colluding firms) would

increase the profits. $\rightarrow$	The relevant market will be narrower
decrease the profits. $\rightarrow$	The relevant market will be wider
not change the profits. $\rightarrow$	The relevant market is *identified*

SSNIP Test: Example 1

$$(P_0-C)Q_0>(P_1-C)Q_1$$
$$\rightarrow \text{The hypothetical price increase is not profitable.}$$
$$\rightarrow \text{The market will be wider.}$$

Price

The profit after P increase
$=(P_1-C)Q_1$

Market Demand Curve

P1

P0

C

Incremental (unit) cost

The profit before P increase
$=(P_0-C)Q_0$

Q1   Q0   Quantity

46
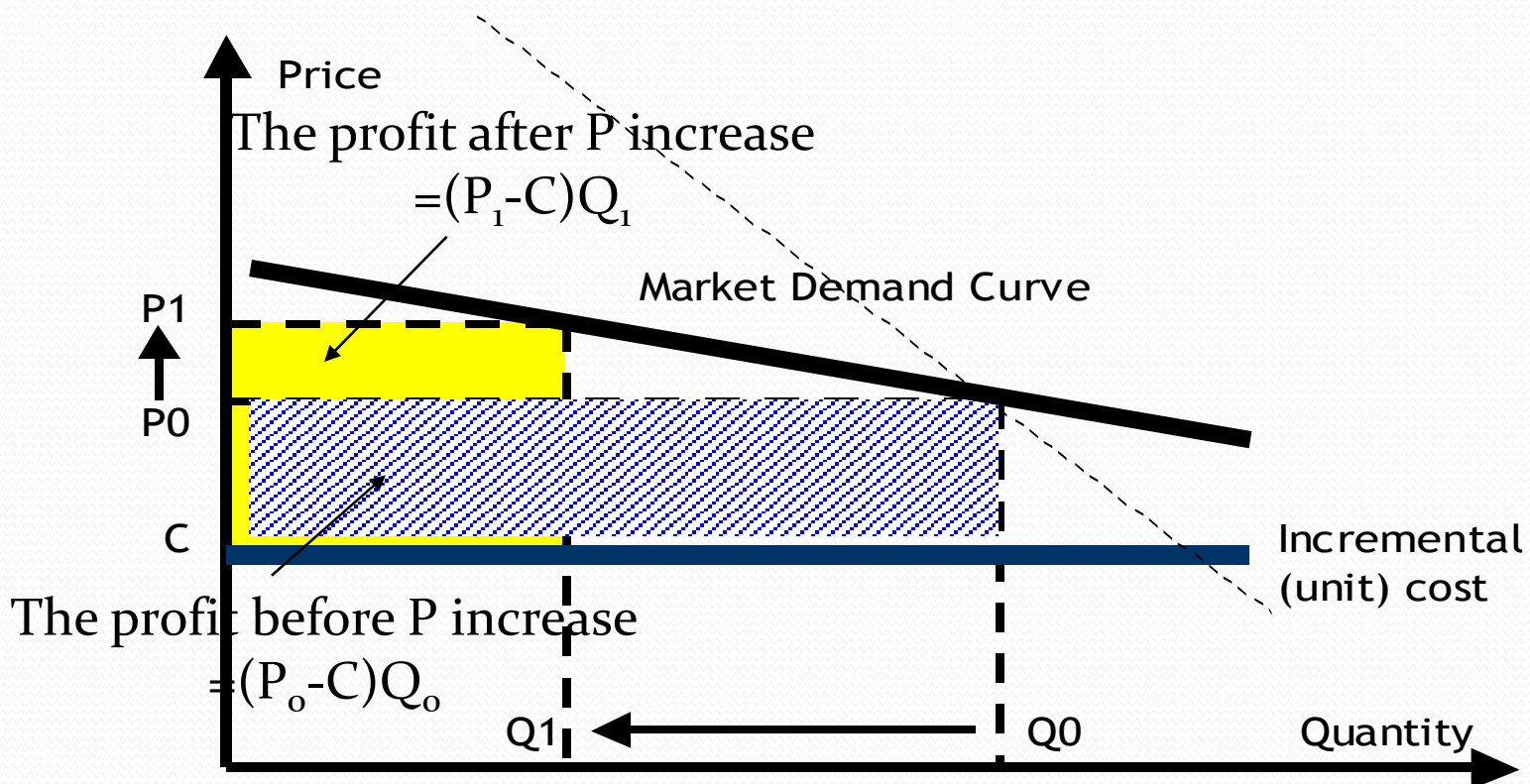
SSNIP Test: Example 2

$$(P_0-C)Q_0<(P_1-C)Q_1$$
$$\rightarrow \text{The hypothetical price increase is profitable.}$$
$$\rightarrow \text{The market will be narrower.}$$

Price

Market Demand Curve

The profit after P increase
$=(P_1-C)Q_1$

Point after P increase

Point before P increase

P1

P0

C

Incremental (unit) cost

The profit before P increase
$=(P_0-C)Q_0$

Q1　Q0　Quantity

47
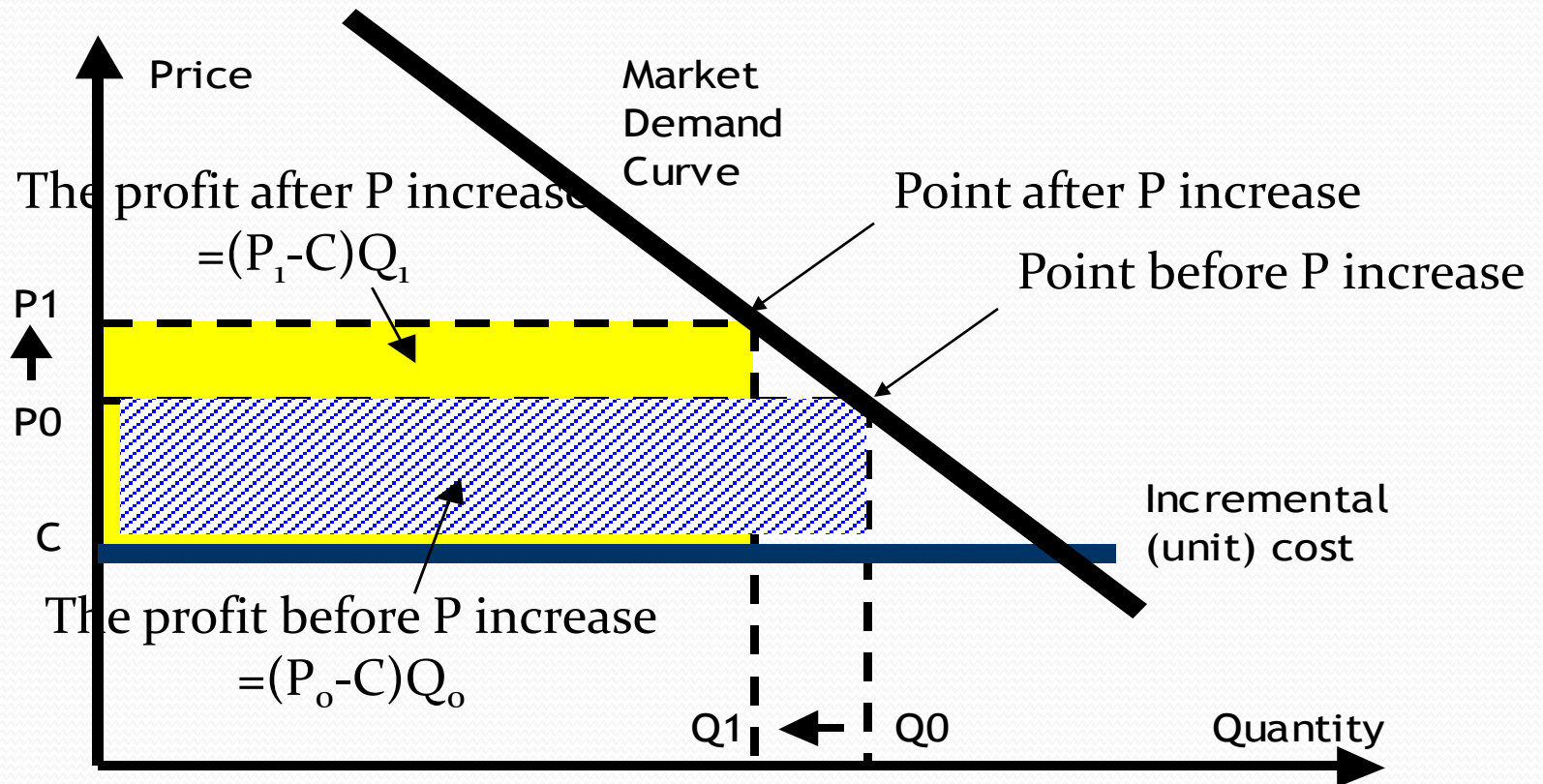
SSNIP Test:
Example 3

$$(P_o-C)Q_o=(P_1-C)Q_1$$
$\rightarrow$ The hypothetical price increase does not change profits.
$\rightarrow$ The market is identified.

Price

The profit after P increase
$=(P_1-C)Q_1$
Market Demand Curve

P1

P0

C

Incremental (unit) cost

The profit before P increase
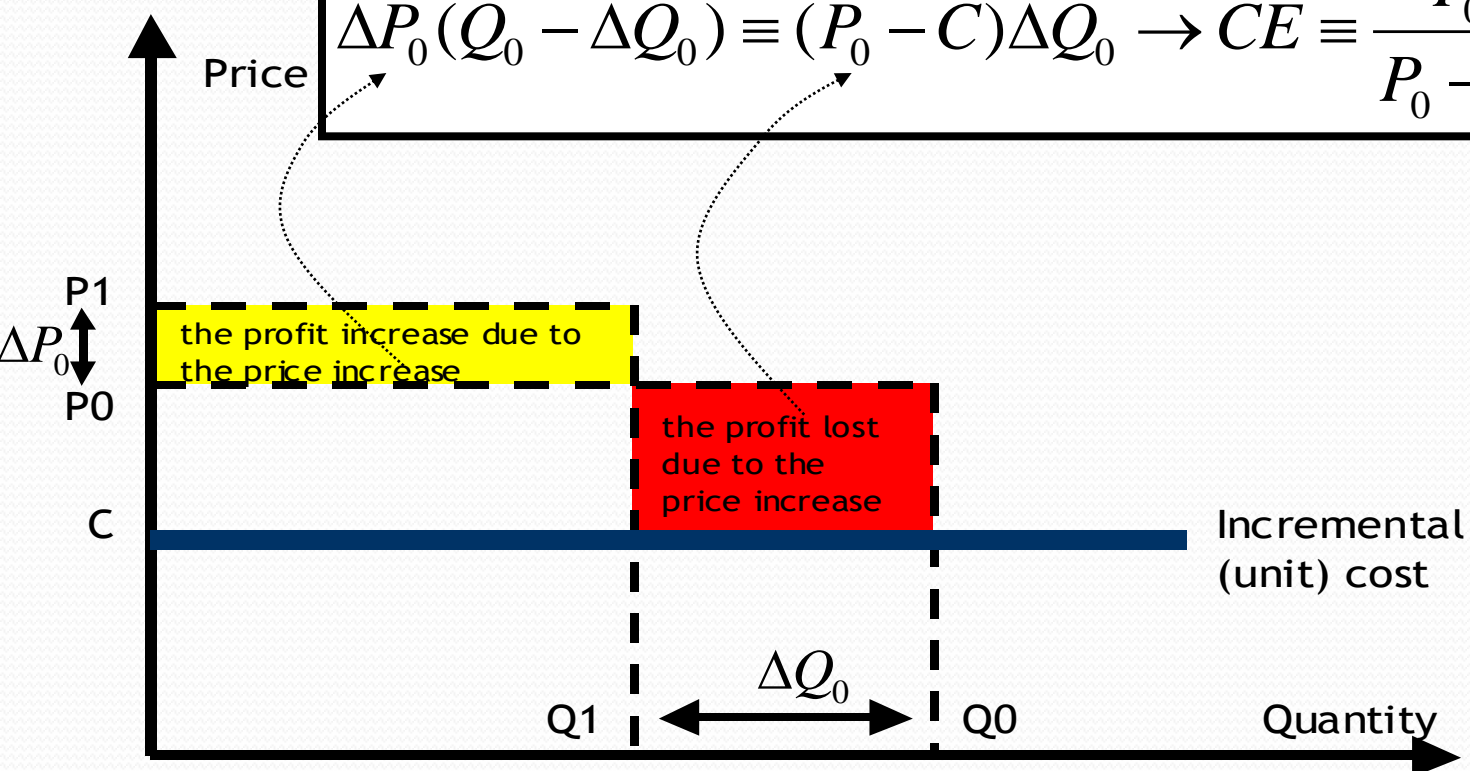$=(P_o-C)Q_o$

Q1

Q0

Quantity

48
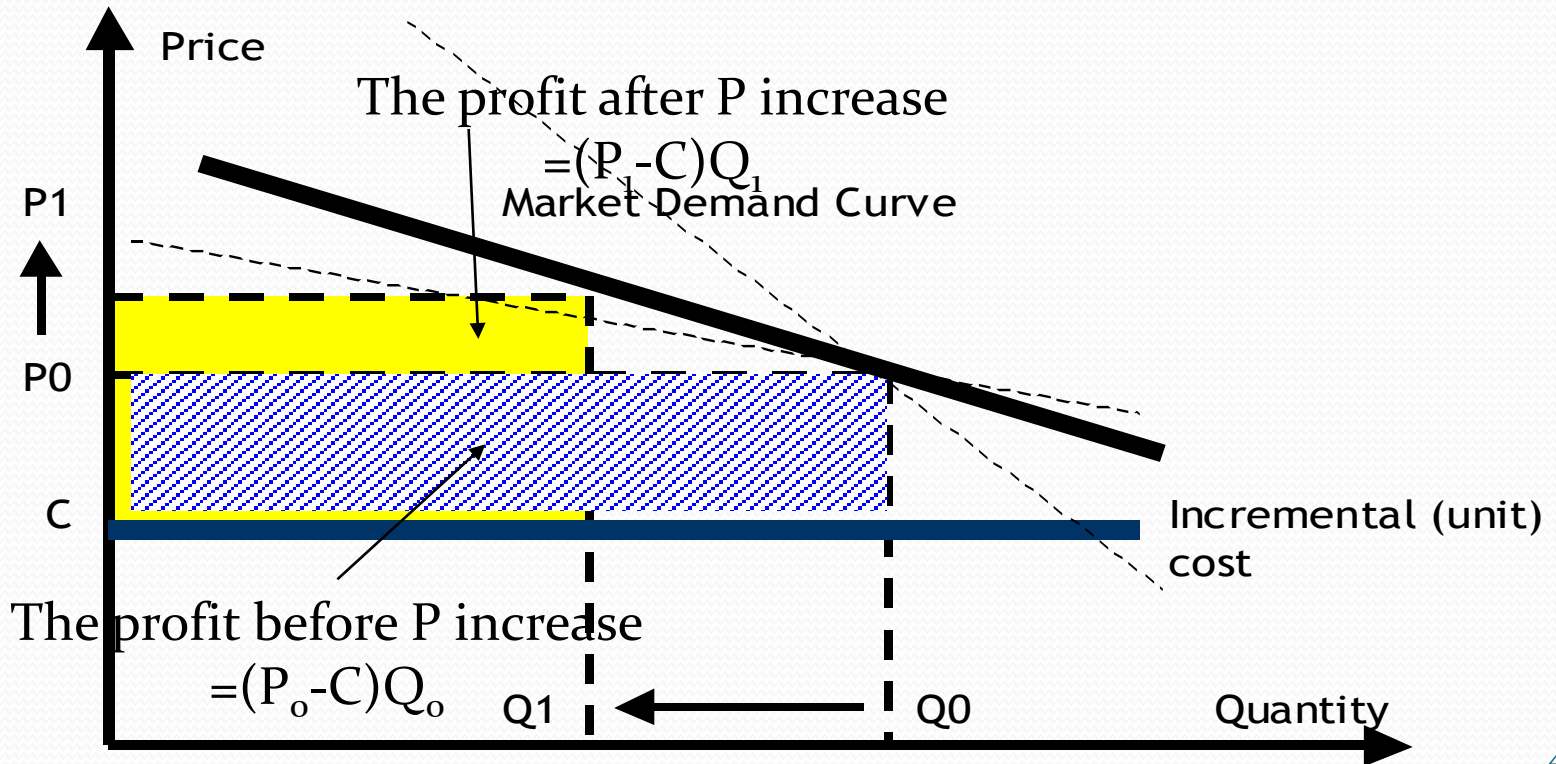
Critical Elasticity Analysis (1)

Critical elasticity of demand (CE) = the elasticity of demand at which the firms' profits do not change with the price increase (say, 5%).

$$\Delta P_0 (Q_0 - \Delta Q_0) \equiv (P_0 - C)\Delta Q_0 \rightarrow CE \equiv \frac{P_0}{P_0 - C}$$

Price

P1

ΔP_0

the profit increase due to the price increase

P0

the profit lost due to the price increase

C

Incremental (unit) cost

ΔQ_0

Q1   Q0   Quantity

Critical Elasticity Analysis (2)

Critical Elasticity of Demand Analysis for Market Definition

Calculate *CE* $\rightarrow$ Calculate *AE* $\rightarrow$ Compare *CE* with *AE*

In fact, comparing CE with AE is equal to comparing the premerger profits and the postmerger profits

CE<AE $\rightarrow$	**Price rising is not profitable** because CE<AE $\Leftrightarrow$ **$(P_0-C)Q_0 > (P_1-C)Q_1$**	$\rightarrow$ Market is *wider*
CE>AE $\rightarrow$	**Price rising is profitable** because CE>AE $\Leftrightarrow$ **$(P_0-C)Q_0 < (P_1-C)Q_1$**	$\rightarrow$ Market is *narrower*
CE=AE $\rightarrow$	**Price rising does not change the profits** because CE=AE $\Leftrightarrow$ **$(P_0-C)Q_0 = (P_1-C)Q_1$**	$\rightarrow$ Market is *identified*

Critical Elasticity Analysis: Practice

Start from small market (A), and calculate AE

⬇

CE<AE, so market will be wider than (A)

⬇

Add another market (B) to market (A), and calculate AE

⬇

CE<AE, so market will be wider than (A+B)

⋮

Add another market (Y) to market (A to X), and calculate AE

⬇

CE=AE, then the relevant market is (A to Y)

How can we know the next possible market (B) to add?

⬇

- Price Correlation Coefficient
- Switching Analysis
- Cross Price Elasticity of Demand

Role of Cross Price Elasticity of Demand in defining relevant market

Cross price elasticity of demand (for product B with respect to product A's price) shows accurately the degree of demand substitution between products
= percentage change in quantity demanded for product B in response to 1 percentage change in product A's price.

- If the elasticity is positive, they may be substitutes.

$$\varepsilon_{BA} = \frac{\dfrac{\text{the change in product B's quantity demanded}}{\text{the initial product B's quantity demanded}}}{\dfrac{\text{the change in product A's price}}{\text{the initial product A's price}}} = \frac{\dfrac{\Delta D_B}{D_B}}{\dfrac{\Delta P_A}{P_A}}$$

To estimate the elasticity, econometric analysis with the detailed data is generally required.

Critical Elasticity Analysis (3)

We have to know "C" (marginal cost) to implement Critical Elasticity Analysis. How can we know it?

Normally it is very difficult to estimate marginal cost directly.

(sometimes estimate from elasticity data)

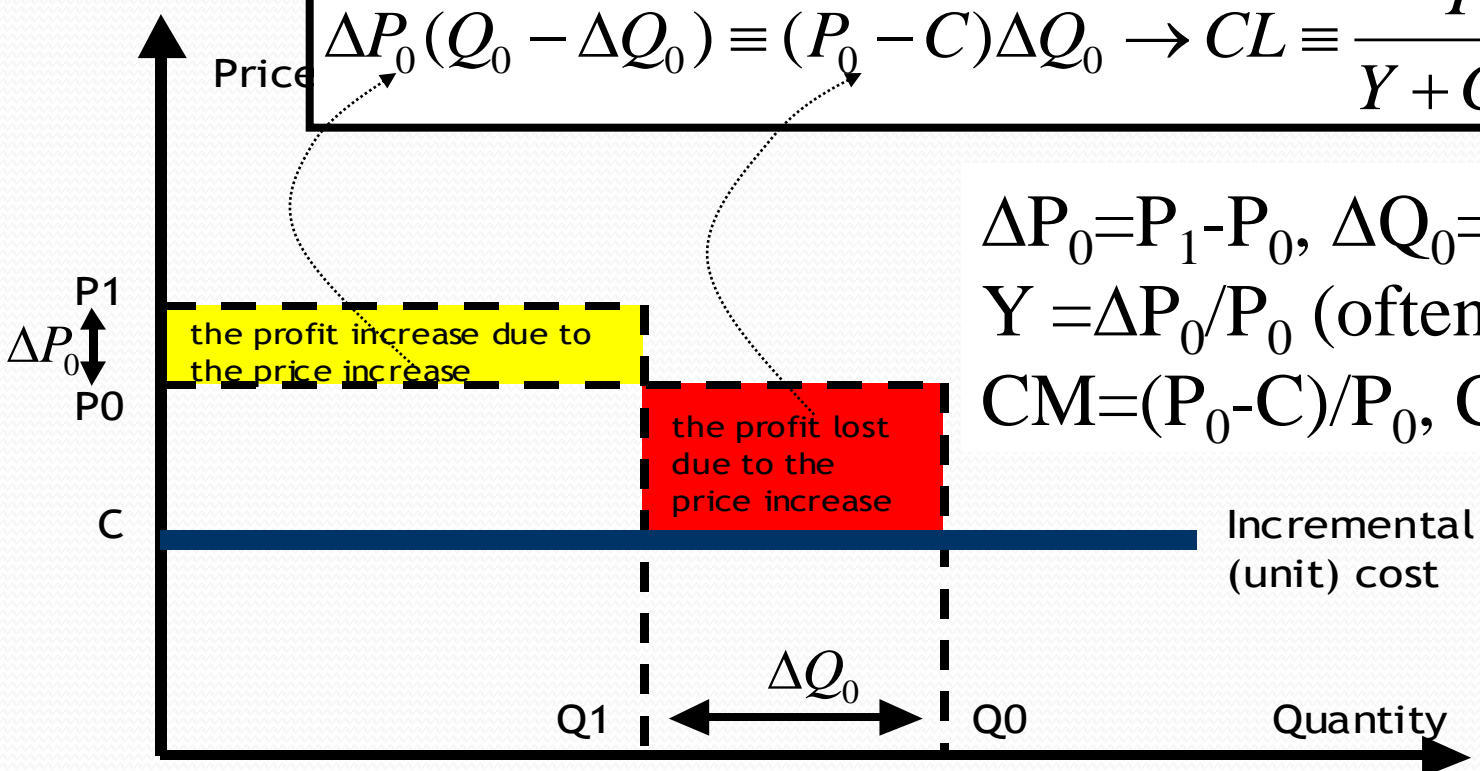*Focusing on the equation of CE :* $CE \equiv \dfrac{P_0}{P_0 - C}$

CE>1 because C>0

If AE≤1, we know AE<CE ⟶ Market will be narrower

Bumble Bee / Connor Case

Critical Loss Analysis: Critical Loss

Critical loss (CL) = the (% of) the lost sales at which the firms' profits do not change with the price increase (say, 5%).
It generally requires financial data to guess price-cost margin.

$$\Delta P_0(Q_0 - \Delta Q_0) \equiv (P_0 - C)\Delta Q_0 \to CL \equiv \frac{Y}{Y + CM}$$

Price
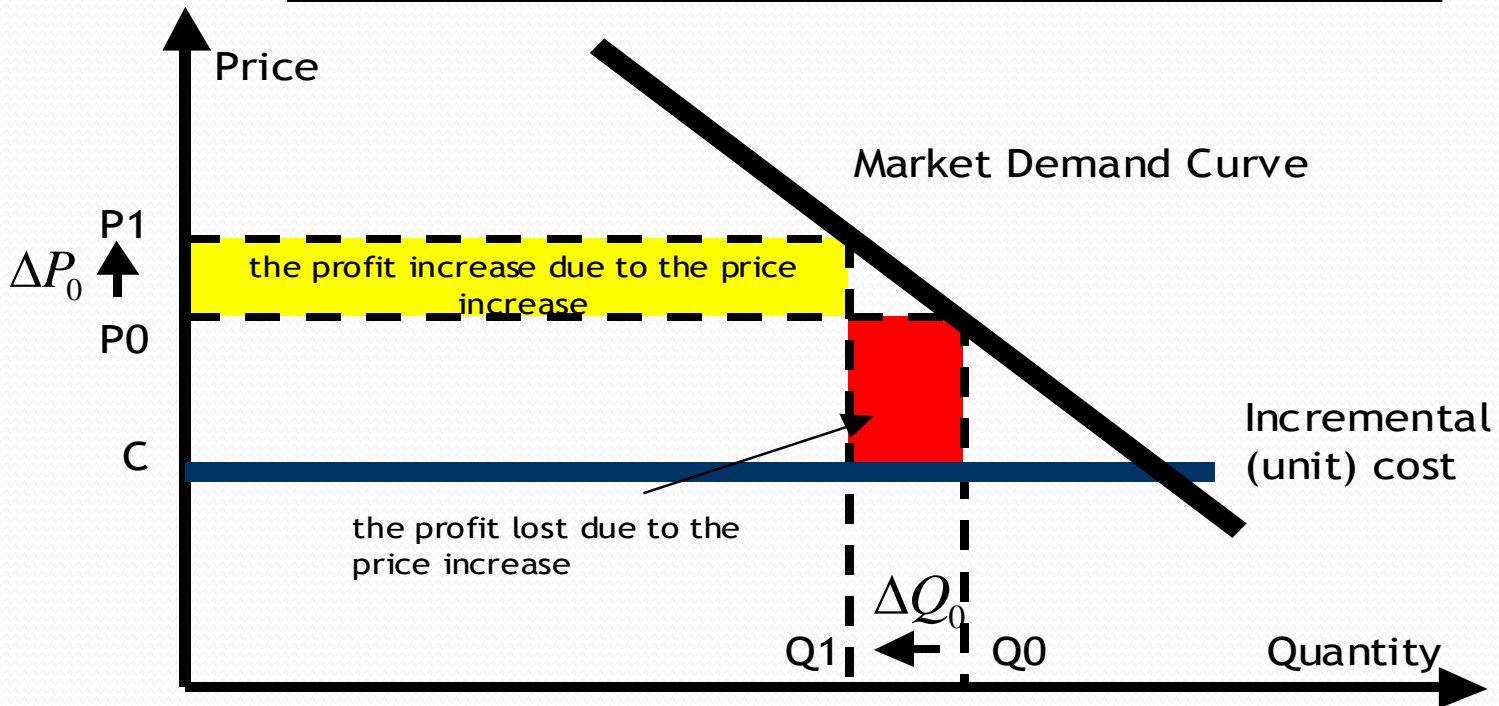
$\Delta P_0 = P_1 - P_0,\ \Delta Q_0 = Q_1 - Q_0,$
$Y = \Delta P_0/P_0$ (often 5%),
$CM = (P_0 - C)/P_0,\ CL = \Delta Q_0/Q_0$

P1

ΔP_0

the profit increase due to the price increase

P0

the profit lost due to the price increase

C

Incremental (unit) cost

ΔQ_0

Q1   Q0   Quantity

Critical Loss Analysis: Actual Loss

Actual loss (AL) = the (% of) actual lost sales with the price increase (say, 5%).
It generally requires an estimate of the price elasticity of demand.

$$AL \equiv \Delta Q_0 / Q_0 = \text{price elasticity} \times Y$$

Price

Market Demand Curve

P1

ΔP_0

the profit increase due to the price increase

P0

C

Incremental (unit) cost

the profit lost due to the price increase

ΔQ_0

Q1 ← Q0

Quantity

55

Critical Loss Analysis: Practice

Critical Loss Analysis Practice for Market Definition

Calculate *CL* $\rightarrow$ Calculate *AL* $\rightarrow$ Compare *CL* with *AL*

In fact, comparing CL with AL is equal to comparing the premerger profits and the postmerger profits

CL>AL $\rightarrow$	**Price rising is profitable** because CL>AL $\Leftrightarrow$ **$(P_0-C)Q_0 < (P_1-C)Q_1$**	$\rightarrow$ Market is *narrower*
CL<AL $\rightarrow$	**Price rising is not profitable** because CL<AL $\Leftrightarrow$ **$(P_0-C)Q_0 > (P_1-C)Q_1$**	$\rightarrow$ Market is *wider*
CL=AL $\rightarrow$	**Price rising does not change the profits** because CL=AL $\Leftrightarrow$ **$(P_0-C)Q_0 = (P_1-C)Q_1$**	$\rightarrow$ Market is *identified*

Summary

Price Correlation Analysis

Stationary Analysis

Switching Analysis

→

- *Useful to find substitutable goods/geographical areas* to identify relevant markets
- Tend to be technically simple but careful interpretation is required

Elzinga- Hogarty Test

→

- *Useful for rough identification of geographical areas*
- Tend to be technically simple but no background of theory

Price Elasticity Analysis

Critical Elasticity Analysis

Critical Loss Analysis

→

- *More consistent with the idea of SSNIP test* to identify relevant markets
- Technically demanding but interpretation is clearer

Market Definition 57/28

Not to Spend a disproportionate Amount of Time and Resources on Market Definition

- Though relevant Market Definition is important, but it is not an end in an investigation.

- The question that matters for substantial evaluation is the effect of the behavior under investigation on the market.

- Qualitative assessment is also useful for market definition very much.
  - ✓ The degree of product substitutability very often matches the degree of similarity of utility for users. (1) Usage and (2) Recognition and Actions of Users can be taken into consideration.
  - ✓ The degree of substitutability between the products supplied in each area can very often be determined by the behavior of users and suppliers, and the existence of issues in the transportation of the product.

Outline

- *Introduction*
- *Market Definition*
- *Failing Company*
- *Competitive Assessment*

Assessing the Financial Condition of the Merging Firms

- *Failing Firm Defense (US)*

- As the <u>US Supreme Court</u> stated in United States v. General Dynamics Corp. (415 U.S. 486 [1974]), this idea "presupposes that the effect on competition and 'the loss to [the company's] stockholders and injury to the communities where its plants were operated' will be less if a company continues to exist even as a party to a merger than if it disappears entirely from the market."

Failing Company 60/72

Assessing the Financial Condition of the Merging Firms

- *Failing Firm Defense (US)*
- There are <u>three requirements</u>:
  - The proponent of the acquisition must demonstrate that the company to be acquired is <u>in imminent danger of failure</u>.
  - The failing firm must have <u>no realistic prospect for a successful reorganization</u>.
  - The failing firm doctrine is available only if <u>there is no viable alternative purchaser</u> that poses less anticompetitive risk.

Assessing the Financial Condition of the Merging Firms

- *Failing Firm Defense (US)*
- 2010 Merger Guidelines:
  - "The Agencies do not normally credit claims that the assets of the failing firm would exit the relevant market unless all of the following circumstances are met: (1) the allegedly failing firm would <u>be unable to meet its financial obligations in the near future</u>; (2) it would <u>not be able to reorganize successfully under Chapter 11 of the Bankruptcy Act</u>; and (3) it has made unsuccessful good-faith efforts to elicit <u>reasonable alternative offers</u> that would keep its tangible and intangible assets in the relevant market and pose a less severe danger to competition than does the proposed merger."

Failing Company 62/72

Assessing the Financial Condition of the Merging Firms

- *Failing Firm Defense (US)*
- 2010 Merger Guidelines –Failing Division:
  - "Similarly, a merger is unlikely to cause competitive harm if the risks to competition arise from the acquisition of a failing division. The Agencies do not normally credit claims that the assets of a division would exit the relevant market in the near future unless both of the following conditions are met:"

Assessing the Financial Condition of the Merging Firms

- *Failing Firm Defense (US)*
- 2010 Merger Guidelines –Failing Division:
  - " (1) applying cost allocation rules that reflect true economic costs, <u>the division has a persistently negative cash flow on an operating basis</u>, and <u>such negative cash flow is not economically justified for the firm by benefits</u> such as added sales in complementary markets or enhanced customer goodwill;[17] and
  - (2) the owner of the failing division has made <u>unsuccessful good-faith efforts to elicit reasonable alternative offers</u> that would keep its tangible and intangible assets in the relevant market and pose a less severe danger to competition than does the proposed acquisition."

Assessing the Financial Condition of the Merging Firms

- *Failing Firm Defense (Japan)*
- 2009 Merger Guidelines – Financial Conditions of the Company Group:
- A. Poor Results, etc.
- To evaluate the business ability of the company group, <u>the financial conditions</u>, such as whether the results of part of the company group or the business section in question are poor or not, <u>are also taken into consideration</u>.

Assessing the Financial Condition of the Merging Firms

- *Failing Firm Defense (Japan)*
- 2009 Merger Guidelines – Financial Conditions of the Company Group:
- B. When the Possibility that the Business Combination May Be Substantially to Restrain Competition Is Usually Thought to Be Small
- Whether or not a business combination has the potential to substantially restrain competition in a particular field of trade is determined by taking into comprehensive consideration all relevant determining factors in each of the specific cases. In the following cases, however, the possibility that the effect of a horizontal business combination may be substantially to restrain competition in a particular field of trade by unilateral conducts is usually thought to be small.

Assessing the Financial Condition of the Merging Firms

- *Failing Firm Defense (Japan)*
- 2009 Merger Guidelines – Financial Conditions of the Company Group:

- (a) A party to the combination has recorded <u>continuous and significant ordinary losses or has excess debt</u> or is unable to obtain finance for working capital and it is obvious that the party <u>would be highly likely to go bankrupt and exit the market</u> in the near future without the business combination.

- Moreover, it is <u>difficult to find</u> any business operator that can rescue the party with a combination that <u>would have less impact on competition</u> than the business operator that is the other party to the combination.

Assessing the Financial Condition of the Merging Firms

- *Failing Firm Defense (Japan)*
- 2009 Merger Guidelines – Financial Conditions of the Company Group:

- (b) The performance of <u>a business department of a party </u>to the combination is extremely poor such as recording continuous and significant losses and it is obvious that the party would be <u>highly likely to exit the market </u>in the near future without the business combination. Moreover, it is <u>difficult to find any business operator </u>that can rescue the business department with a combination that <u>would have less impact on competition</u> than the business operator that is the other party to the combination.

Assessing the Financial Condition of the Merging Firms

- *Failing Firm Defense (Japan)*
- **Case 8, 1998: Hokuyo Bank Co., accepting assignment of a substantial part of the business of Hokkaido Takushoku Bank Co., (Filing October 2008, Accepting November 2008)**
  - This case is a business transfer of all part of business in Hokkaido area from Hokkaido Takushoku Bank to Hokuyo Bank resulting from being difficult to finance from call money market and deciding to give up independent restructuring

Failing Company 69/72

Assessing the Financial Condition of the Merging Firms

- *Failing Firm Defense (Japan)*
- **Case 8, 1998: Hokuyo Bank - Hokkaido Takushoku Bank Co.,**
  - A particular field of trade

  i) scope of services
  - Deposit service and loan service, each of them forms a particular field of trade in terms of AMA.

  ii) Geographic market
  - From the point of view of business area of both banks, the geographic market is to be a particular field of trade in Hokkaido area. And some specific area form a particular field of trade within the Hokkaido area.

Assessing the Financial Condition of the Merging Firms

- *Failing Firm Defense (Japan) – Two Cases*
- **Case 8, 1998: Hokuyo Bank - Hokkaido Takushoku Bank Co.,**
  - Competitive assessment
  - In this case, after the acquisition, Hokuyo Bank obtain higher market share in deposit and loan service in Hokkaido area and a specific area on Hokkaido (deposit: 20%, loan: 30% in Hokkaido).
  - However, Hokkaido Takushoku Bank decided to give up independent restructuring, then to transfer this business.
  - And both of these particular field of trade have influential competitors respectively.
  - Considering these circumstances comprehensively, it is decided not to exercise substantially restraint of competition in each of particular field of trade .

Failing Company 71/72

Assessing the Financial Condition of the Merging Firms

- *Failing Firm Defense (Japan) – Two Cases*
- **Case 8, 1998: Hokuyo Bank - Hokkaido Takushoku Bank Co.,**
  - Competitive assessment
    - comprehensively, it is decided not to exercise substantially restraint of competition in each of particular field of trade .

Outline

- *Introduction*
- *Market Definition*
- *Failing Company*
- *Competitive Assessment*

Competitive Assessment

Examine the probability of substantial restraint of competition by M&A in relevant markets
1) Unilateral conduct
2) Coordinated conduct

Main factors to be considered
1) market share of the parties
2) market concentration after M&A
3) pressure from import/ entry
4) pressure from customer
5) efficiency   etc.

Consider remedial measures if the original plan would restrain competition

Remedy would, in principle, be structural measure such as transfer of business

Examples of Economic Analysis for Competitive Assessment

- Post-merger market shares of merging parties
- HHI / Concentration ratio
- Natural Experiments
- Event Analysis

Simpler analyses

- Merger Simulation

More technically demanding analyses

Market share, CRn and HHI

Market 1

- A 30%, B 30%, C 30%, D 10%

Market 2

- A 70%, B 10%, C 10%, D 10%

→

CR3: Market 1＝90%, Market 2＝90%

HHI: Market 1＝900＋900＋900＋100=2800

Market 2＝4900＋100＋100＋100=5200

HHI emphasizes the difference of market share.

Post-merger Market Share of Merging Parties

The post-merger Market Share of merging parties is large
→The merger tends to have a large anticompetitive effect.

others 10%
D 5%
A 40%
C 20%
B 25%

A merges with B

others 10%
D 5%
C 20%
A&B 65%
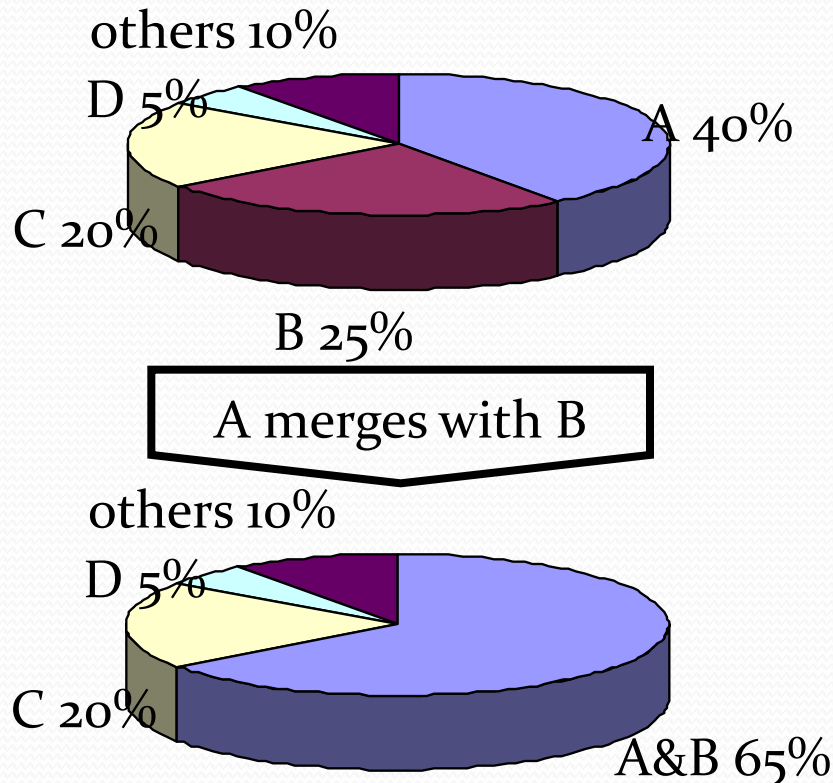
- Firms A and B, having 65% of Market Share in total, through merging, could raise the price.

  ➢ Non-merging firms, C, D, and others might be less competitive (fringe) players.

Post-merger Market Share of Merging Parties: Caveats

- It should be treated as a filter to determine which mergers require more detailed analysis.
  - In the EU GL, the threshold Market Share for *dominant position* is 50%.
- If the merging parties sell unrelated products, the high Market Share is unlikely to cause any anticompetitive effects.

HHI

Post-merger HHI is large and/or ΔHHI is large
→The merger may reduce the market competition.

*The larger HHI is, the smaller the number of firms is
and/or the more skewed the market share distribution is.*

	A	B	C	D	F	G	H	HHI	ΔHHI
Premerger	22	21	17	16	15	5	4	1736	
A&B Merger	43		17	16	15	5	4	2660	924
F&G Merger	22	21	17	16	20		0	1870	134
G&H Merger	22	21	17	16	15	9		1776	40

HHI

In order to calculate exact level of HHI, we have to know shares of all market participants, which are sometimes difficult.

However, it will usually be enough to know the approximate level of HHI in order to implement competitive assessment. (For example, to judge whether it is in the safe harbor or not)

Market
- A 40%, B 30%, C 20%, others in total 10%

$\rightarrow$ HHI should be greater than 2900, and smaller than 3000

Max of HHI = 1600+900+400+100=3000
min of HHI = 1600+900+400+0=2900

HHI: Caveats

- It should be treated as a filter to determine which mergers require more detailed analysis
  - Many authorities stipulate safe-harbor concerning M&A by using HHI and ΔHHI.
- A large HHI is often associated with the high possibility of unilateral (Cournot competition) and coordinated effects (supported by empirical study).

Safe Harbor concerning M&A

Japan	USA	EU
• HHI≤1500 • 1500<HHI≤2500 & ΔHHI≤250 • HHI>2500 & ΔHHI≤150	• HHI<1500 • 1500≤HHI<2500 & ΔHHI<200 • HHI>2500 & ΔHHI<100	• HHI<1000 • 1000≤HHI≤2000 & ΔHHI<250 • HHI>2000 & ΔHHI<150

Competitive Assessment 82/82

Natural Experiments

"Industry history" may provide a useful information of the expected results of mergers.

Examples

- The price change after the previous merger, exit, entry, etc.

- Correlation between the market price (price-cost margin) and concentration ratio, # of (a type of) competitors, etc.

Natural Experiments: The price Change after the Previous Merger, etc.

The historical fact of **the previous merger**	Market Price
Before the previous merger	$100
After the previous merger	$120

The next merger would increase the market price again.

The historical result of **the change in import tariff**	Market Price
Before the reduction of import tariff	$100
After the reduction of import tariff	$100

The import would have weak power to constrain the merging parties' anticompetitive action.

Natural Experiments: The differences of price in the different market conditions

Example: Merger between airline companies

There are 3 airline companies (A, B, C) and A and B are planning to merge.

Current airfare

The airfare of the route that 3 companies compete	About $0.3/km		"The route that 3 companies compete" is sure to change into "the route that 2 companies compete" after the merger between A & B, and the airfare will rise from $0.3/km to $0.4/km, and so on.
The airfare of the route that 2 companies compete	About $0.4/km	→	
The airfare of the route that only 1 company operate	About $0.5/km		

ex. Staples/ Office Depot case

Natural Experiments: Correlation between Price and Concentration Ratio, etc.

market price,
price-cost margin
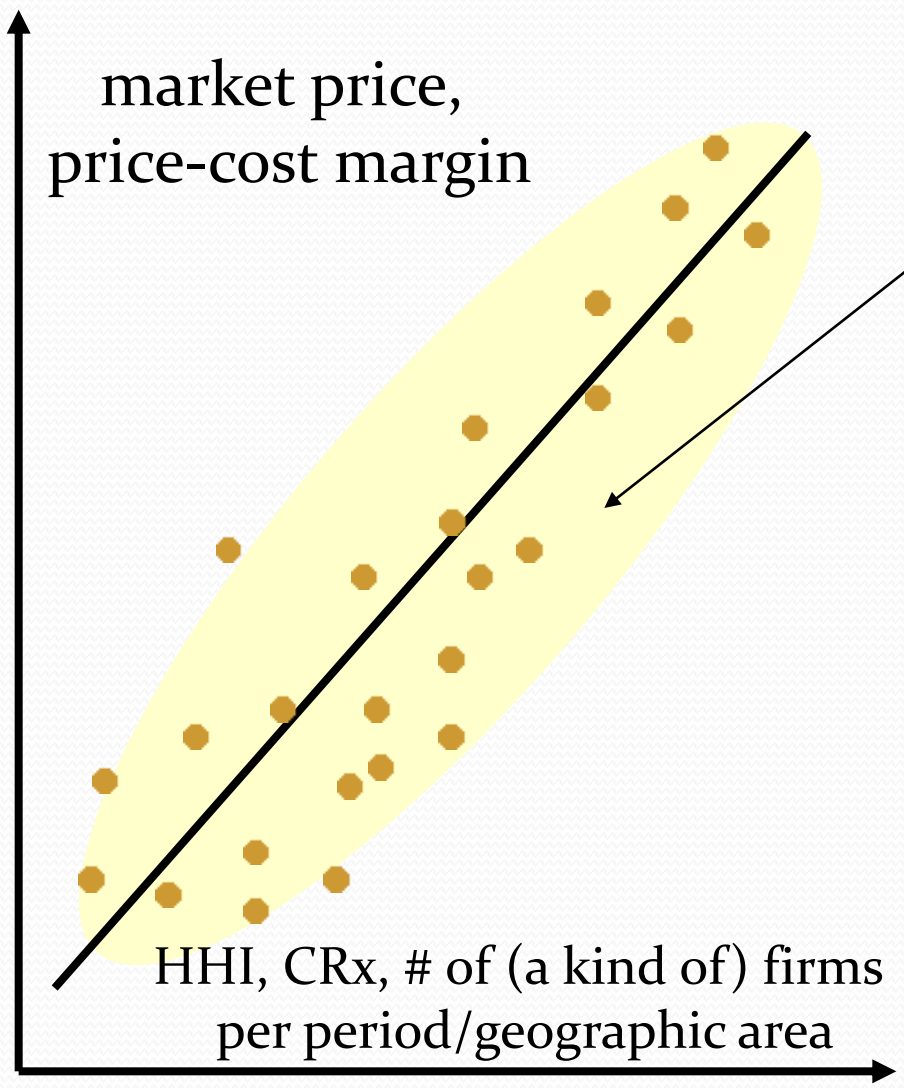
The presence of positive correlation could suggest that an additional merger may have anticompetitive impacts.

HHI, CRx, # of (a kind of) firms
per period/geographic area

Merger Simulation

Unilateral Effect

- In considering automobile market, there are some brands of Toyota, Nissan, Benz, BMW, GM...

- **Cross-substitution of demand** is not the same: **Differentiated Goods**

- If the price of Benz increase, many demands go to BMW.

→ Maybe merger between Benz and BMW is more harmful than Benz and Toyota.

← Market Share is not so important in this case.

Merger Simulation

Merger Simulation is a method for estimating directly the post-merger prices, sales, shares, etc. and comparing the pre-merger competition with the post-merger competition by

1. Identifying the mode of competition (generally, Bertrand) among the firms based on available information,

2. Estimating the own and cross price elasticity of products (and if necessary, price cost margins or marginal costs) with the pre-merger market data,

3. Calculating the post-merger (Nash equilibrium) prices, sales, etc.

• Merger simulation is often used for product-differentiated markets.

• Antitrust Logit, AIDS, and PCAIDS are major merger simulation models.

Merger Simulation is apt to be technically demanding since it would involve complex econometric estimation of price elasticities and numerical calculation.

Merger Simulation

Model for Estimation of Demand Function

$$\omega_{ict} = a_i + \sum_{j=1}^{N} b_{ij} \ln p_{jct}$$

Market share of brand i depends on the price of brand i itself and prices of other brands

ω_{ict} market share of brand i, area c and time t

p_{jct} price of brand j, area c and time t

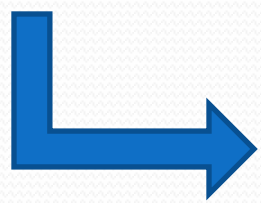| Name of Model	Features
AIDS (Almost Ideal Demand System)	Estimate all the coefficients, so it requires plenty of data and sometimes the results are not consistent .
PCAIDS (Proportionality-Calibrate AIDS)	Assume Proportionality, so it requires relatively small set of data, but sometimes assumption of proportionality is not fulfilled.
ALM (Antitrust Logit Model)	The same as PCAIDS

Merger Simulation

First order condition for profit maximization

Before Merger

$$\pi_i = (p_i - c_i)q_i \quad \Longrightarrow \quad \frac{\partial \pi_i}{\partial p_i} = (p_i - c_i)\frac{\partial q_i}{\partial p_i} + q_i = 0 \quad \text{for each company i}$$

After Merger between A&B

$$\pi_{A+B} = (p_A - c_A)q_A + (p_B - c_B)q_B$$

$$\frac{\partial \pi_{A+B}}{\partial p_A} = (p_A - c_A)\frac{\partial q_A}{\partial p_A} + q_A + (p_B - c_B)\frac{\partial q_B}{\partial p_A} = 0$$

$$\frac{\partial \pi_{A+B}}{\partial p_B} = (p_A - c_A)\frac{\partial q_A}{\partial p_B} + (p_B - c_B)\frac{\partial q_B}{\partial p_B} + q_B = 0$$

Merged company A&B would consider the effect of price change of A (B) on the quantity change of B (A). Merged company could increase its profit by raising price of A/B.

ex. Volvo – Scania case, Oracle case

Summary

- Post-merger market shares of merging parties
- HHI

→

- *Useful indicators* to judge if a detailed review is required.
- Technically simple but careful interpretation is required

Natural Experiments

→

- *Inductive (historical)* forecasts of the mergers' effects
- Generally technically simple but careful interpretation is required

- Merger simulation

→

- *Deductive (theoretical) forecasts* of the mergers' effects
- Generally technically demanding and result is sometimes not reliable

Note for Economic Analyses

- ✓ It may be dangerous to rely too much on the results of economic analyses.
- ✓ Qualitative evidence is also important and economic evidence should be *consistent with* (*complementary to*) qualitative evidence for merger evaluation.
- ✓ It is important to implement as many analyses as possible from the data obtained and examine the consistency of results from various analyses.

Thank you for your attention.

- Comments, Views, and Opinions

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