

# Market structure and strategic competition

The Economics of Regulation and Competition

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# Market structure

- We are going to investigate two key elements of market structure
  - Concentration
  - Entry conditions
- **Concentration**
  - How can one measure the market concentration?
    - An index (in the static sense) can be of use
  - From a welfare and antitrust perspective, a concentration index (CI) should measure the ability of firms to raise price above the competitive level.
  - Note that a CI is particularly concerned with actual competition and ignores potential competition
    - Potential competition: the effect that the threat of entry has on the price-cost margin
    - Thus CI cannot fully assess the competitiveness of a particular industry

# Indices the measure competition

- **Concentration ratio**

- One of the main indices to measure concentration
- “m-firm” concentration ratio: the share of total industry sales accounted by the m largest firms.

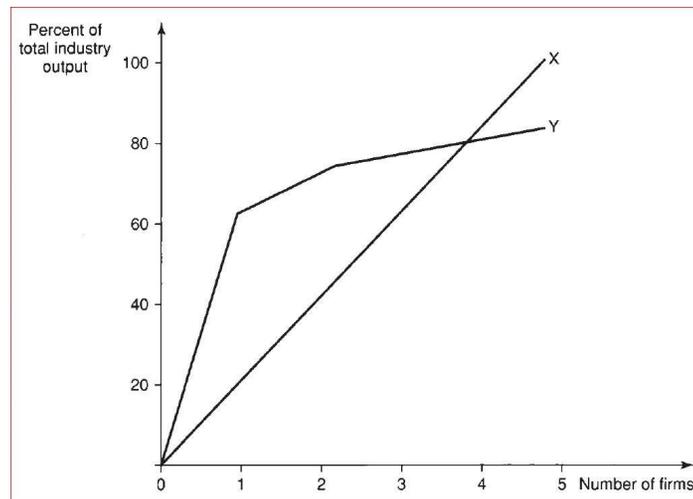
Table: % of sales accounted by the five leading firms in industries X and Y

Firm	Industry X	Industry Y
1	20	60
2	20	10
3	20	5
4	20	5
5	20	5
Total	100	85

# Indices the measure competition

- **Concentration ratio (ctd.)**

- This type of measure can waste relevant data.
- Nevertheless, the concentration ratio is superior to a simple count of sellers
- Concentration curves for industries X and Y:



# Indices the measure competition

- **Herfindahl and Hirschman Index (HHI)**
- In 1992, the Antitrust Division of Justice Department and the Federal Trade Commission issued new guidelines expressed in terms of the HHI

- Consider an industry with

- n number of firms
- $s_i$  denotes firm  $i$ 's share of total industry sales (*i.e.*, market share)

$$HHI = 1000 * (s_1^2 + s_2^2 + \dots + s_n^2)$$

- Revisiting our earlier example:

- $HHI_X = 10000(0.04 + 0.04 + 0.04 + 0.04 + 0.04) = 2000$
- $HHI_Y = 10000(0.36 + 0.01 + 0.0025 * 6) = 3800$ 
  - We assumed that firms 6,7, and 8 each made 5% of the industry sales

# Indices the measure competition

- **HHI (ctd.)**

- HHI would indicate that industry X is more likely to exhibit competitive behavior
- How is this metric used? For example, in the US, the Justice Department regards a HHI of 1000 as critical. That is, if a merger leaves the HHI at 1000 or less, the merger is unlikely to be challenged as violating antitrust laws.
- HHI has foundations in oligopoly theory.

- $$\frac{HHI}{10000 \eta} = s_1 \left( \frac{P - MC_1}{P} \right) + s_2 \left( \frac{P - MC_2}{P} \right) + \dots + s_n \left( \frac{P - MC_n}{P} \right)$$

# Using concentration indices in antitrust policy

- There is also empirical evidence which indicates that a high concentration index for an industry is a signal of high price-cost margin.
- What policy implications should be drawn?
- To answer, one must have a theory for why concentration & price-cost margin are positively related.
- Two main hypothesis:
  1. Collusion hypothesis
  2. (Harold Demsetz's) Differential efficiency hypothesis

# Collusion hypothesis

- The more concentrated an industry is, the less competitive are firms, and therefore, the higher the price-cost margin.
  - Hence, High concentration & less competition implies higher price-cost margin
- One can establish this results using the Cournot model with 'n' firms (we may skip...)
- The smaller the number of firms, the concentration will be greater. With higher concentration, the price-cost margin will be higher.

- $$\frac{P-MC}{P} = \frac{1}{n\eta}$$

# Collusion hypothesis

- Additionally, collusion is found to be easier with a fewer number of firms.
- Policy implication: Break up highly concentrated industries.

## Differential efficiency hypothesis (DEH)

- In some industries, some firms are likely to have a differential advantage over their competitors. This could be due to lower costs or better products. These superior firms therefore dominate the market, leading to high concentrations.
- Thus, industries differ in the importance of long-lived efficiency difference among sellers.
- Where these differences are insignificant, concentration and profitability will be low.
- Where efficiency differences are important the most efficient firms will grow large relative to their rivals.
- Both concentration and profitability (or price-cost margin) will therefore be high in such cases.

# Differential efficiency hypothesis

- So, while DEH is in particular about firms (those firms with high market share will tend to have a high price-cost margin), it also implies that at the industry level, after aggregating individual data, one will tend to observe high industry concentration with high industry price-cost margins.
- Accordingly, one does not want to break up highly concentrated industries. To do so would penalize firms for being superior and thereby deter them from providing better products at lower costs.
- Empirical evidence strongly supports DEH: firms' profits is strongly and positively associated with its market share.
- There is typically a weak positive association between industry profit and concentration.