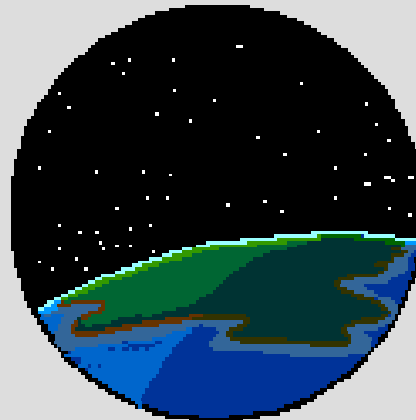


# *Managerial Economics & Business Strategy*

## Chapter 7

### The Nature of Industry



# Overview

## I. Market Structure

- Measures of Industry Concentration

## II. Conduct

- Pricing Behavior
- Integration and Merger Activity

## III. Performance

- Dansby-Willig Index
- Structure-Conduct-Performance Paradigm

## IV. Preview of Coming Attractions

# Industry Analysis

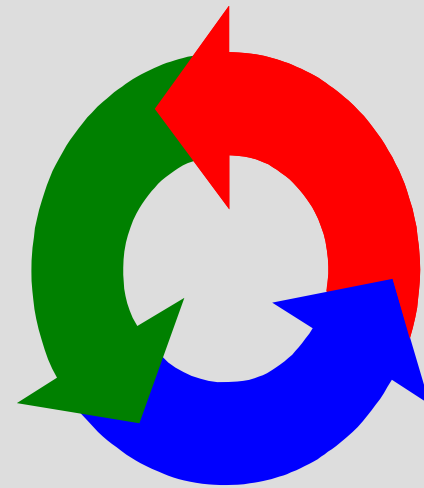
- Market Structure
  - Number of firms.
  - Industry concentration.
  - Technological and cost conditions.
  - Demand conditions.
  - Ease of entry and exit.
- Conduct
  - Pricing.
  - Advertising.
  - R&D.
  - Merger activity.
- Performance
  - Profitability.
  - Social welfare.

# Approaches to Studying Industry

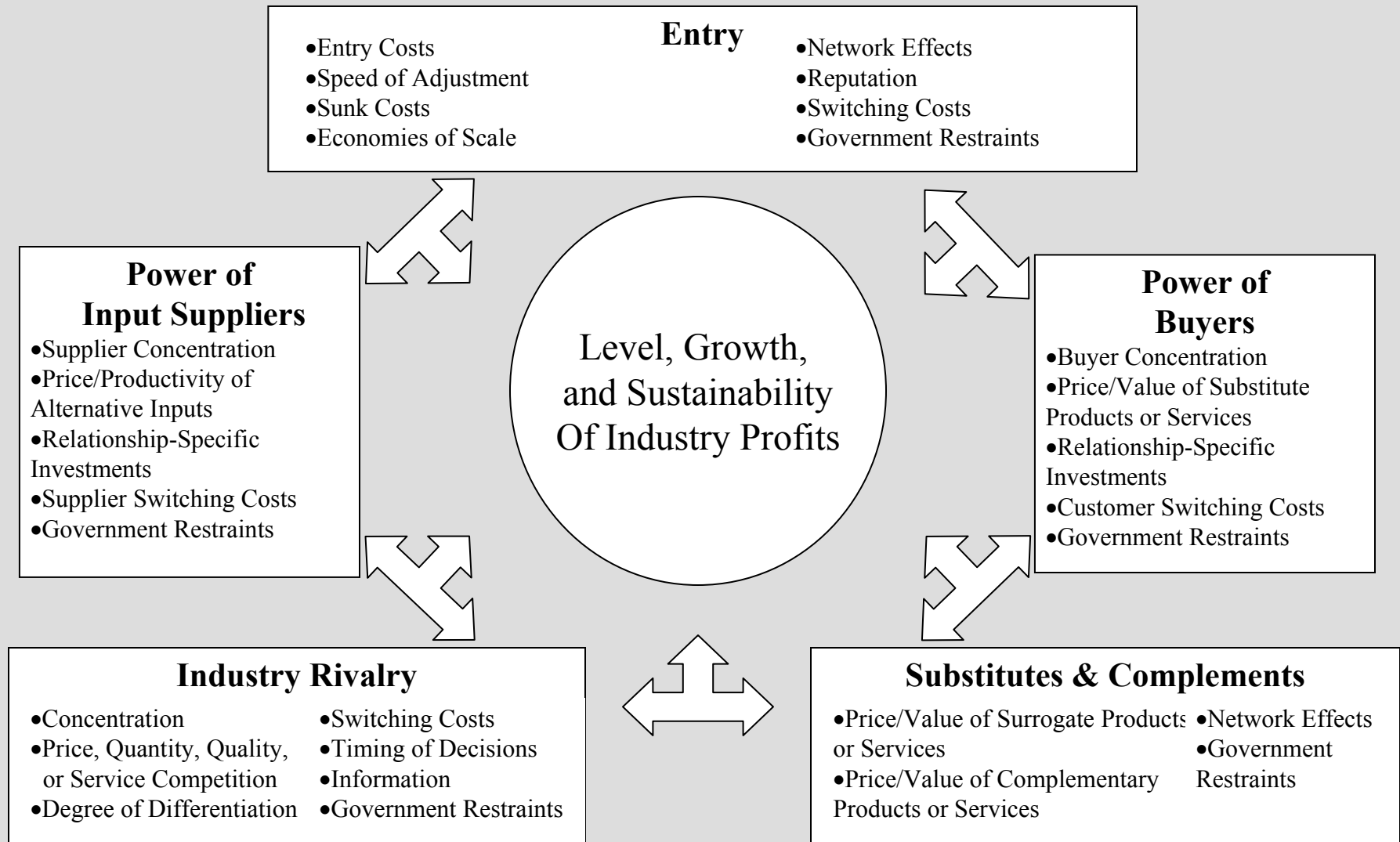
- The *Structure-Conduct-Performance (SCP)* Paradigm: Causal View



- The *Feedback Critique*
  - No one-way causal link.
  - Conduct can affect market structure.
  - Market performance can affect conduct as well as market structure.



# Relating the Five Forces to the SCP Paradigm and the Feedback Critique



# Industry Concentration

- Four-Firm Concentration Ratio
  - The sum of the market shares of the top four firms in the defined industry. Letting  $S_i$  denote sales for firm  $i$  and  $S_T$  denote total industry sales

$$C_4 = w_1 + w_2 + w_3 + w_4, \text{ where } w_i = \frac{S_i}{S_T}$$

- Herfindahl-Hirschman Index (HHI)
  - The sum of the squared market shares of firms in a given industry, multiplied by 10,000:  $HHI = 10,000 \times \sum w_i^2$ , where  $w_i = S_i/S_T$ .

# Example

- There are five banks competing in a local market. Each of the five banks have a 20 percent market share.
- What is the four-firm concentration ratio?

$$C_4 = 0.2 + 0.2 + 0.2 + 0.2 = 0.8$$

- What is the HHI?

$$HHI = 10,000 \left( (.2)^2 + (.2)^2 + (.2)^2 + (.2)^2 + (.2)^2 \right) = 2,000$$

# Limitation of Concentration Measures

- Market Definition: National, regional, or local?
- Global Market: Foreign producers excluded.
- Industry definition and product classes.



# Measuring Demand and Market Conditions

- The Rothschild Index ( $R$ ) measures the elasticity of industry demand for a product relative to that of an individual firm:

$$R = E_T / E_F .$$

- $E_T$  = elasticity of demand for the total market.
  - $E_F$  = elasticity of demand for the product of an individual firm.
  - The Rothschild Index is a value between 0 (perfect competition) and 1 (monopoly).
- When an industry is composed of many firms, each producing similar products, the Rothschild index will be close to zero.

# Own-Price Elasticities of Demand and Rothschild Indices

<i>Industry</i>	<i>Elasticity of Market Demand</i>	<i>Elasticity of Firm's Demand</i>	<i>Rothschild Index</i>
Food	-1.0	-3.8	0.26
Tobacco	-1.3	-1.3	1.00
Textiles	-1.5	-4.7	0.32
Apparel	-1.1	-4.1	0.27
Paper	-1.5	-1.7	0.88
Chemicals	-1.5	-1.5	1.00
Rubber	-1.8	-2.3	0.78

# Market Entry and Exit Conditions

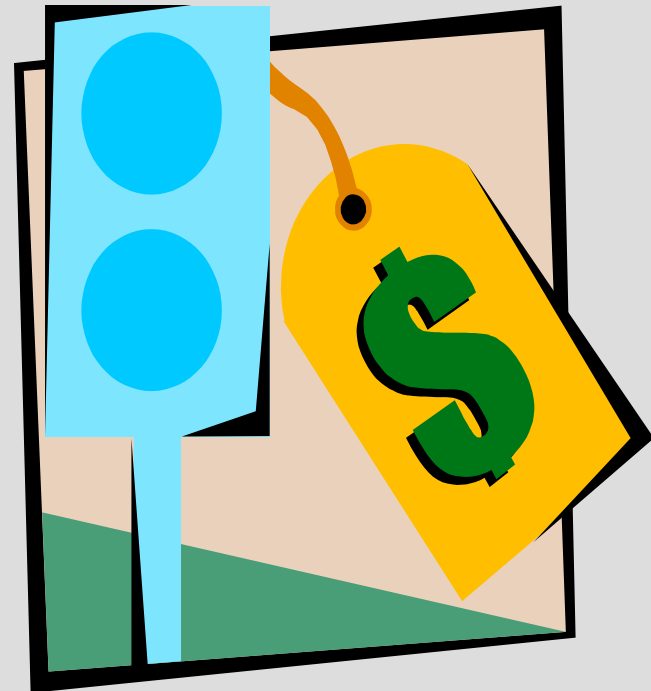
- Barriers to entry
  - Capital requirements.
  - Patents and copyrights.
  - Economies of scale.
  - Economies of scope.

# Conduct: Pricing Behavior

- The Lerner Index

$$L = (P - MC) / P$$

- A measure of the difference between price and marginal cost as a fraction of the product's price.
- The index ranges from 0 to 1.
  - When  $P = MC$ , the Lerner Index is zero; the firm has no market power.
  - A Lerner Index closer to 1 indicates relatively weak price competition; the firm has market power.



# Markup Factor

- From the Lerner Index, the firm can determine the factor by which it should over MC. Rearranging the Lerner Index

$$P = \left( \frac{1}{1-L} \right) MC$$

- The markup factor is  $1/(1-L)$ .
  - When the Lerner Index is zero ( $L = 0$ ), the markup factor is 1 and  $P = MC$ .
  - When the Lerner Index is 0.20 ( $L = 0.20$ ), the markup factor is 1.25 and the firm charges a price that is 1.25 times marginal cost.

# Lerner Indices & Markup Factors

<i>Industry</i>	<i>Lerner Index</i>	<i>Markup Factor</i>
Food	0.26	1.35
Tobacco	0.76	4.17
Textiles	0.21	1.27
Apparel	0.24	1.32
Paper	0.58	2.38
Chemicals	0.67	3.03
Petroleum	0.59	2.44

# Integration and Merger Activity

- Vertical Integration
  - Where various stages in the production of a single product are carried out by one firm.
- Horizontal Integration
  - The merging of the production of similar products into a single firm.
- Conglomerate Mergers
  - The integration of different product lines into a single firm.

# DOJ/FTC Horizontal Merger Guidelines

- Based on  $HHI = 10,000 \sum w_i^2$ , where  $w_i = S_i / S_T$ .
- Merger may be challenged if
  - HHI exceeds 1800, or would be after merger, and
  - Merger increases the HHI by more than 100.
- But...
  - Recognizes efficiencies: “The primary benefit of mergers to the economy is their efficiency potential...which can result in lower prices to consumers...In the majority of cases the *Guidelines* will allow firms to achieve efficiencies through mergers without interference...”



# Performance

- Performance refers to the profits and social welfare that result in a given industry.
- Social Welfare = CS + PS
  - Dansby-Willig Performance Index measure by how much social welfare would improve if firms in an industry expanded output in a socially efficient manner.

# Dansby-Willig Performance Index

<i>Industry</i>	<i>Dansby-Willig Index</i>
Food	0.51
Textiles	0.38
Apparel	0.47
Paper	0.63
Chemicals	0.67
Petroleum	0.63
Rubber	0.49

# Preview of Coming Attractions

- Discussion of optimal managerial decisions under various market structures, including:
  - Perfect competition
  - Monopoly
  - Monopolistic competition
  - Oligopoly

# Conclusion

- Modern approach to studying industries involves examining the interrelationship between structure, conduct, and performance.
- Industries dramatically vary with respect to concentration levels.
  - The four-firm concentration ratio and Herfindahl-Hirschman index measure industry concentration.
- The Lerner index measures the degree to which firms can markup price above marginal cost; it is a measure of a firm's market power.
- Industry performance is measured by industry profitability and social welfare.