Chapter 3: Market Structure and Market Power

Learning Objectives:

Students should learn to:

1. Explain the following measures of structure, how they are used to categorize various industries, and some of the shortcomings of the measures.
    a. Concentration curves
    b. CR_4
    c. CR_8
    d. CR_n
    e. Herfindahl-Hirschman index
2. Explain the difference between a structure measure like CR_4 and a performance measure like efficiency, profitability, or Pareto optimality.
3. Explain the issues related to the *definition of a market* and how this affects measures of concentration. The student will understand that an appropriate definition for one type of analysis may not be appropriate for another type of analysis and how aggregation can both clarify and cloud issues of market structure.
4. Understand the Standard Industrial Classification (SIC) system and the new North American Industry Classification System (NAICS) and how they relate products in production. They will be able to discuss the importance of substitute goods in defining a market and some of the problems in the classification systems as they relate to trade and regional markets.
5. Understand the debate about the prevalence and welfare cost of monopoly power as initiated by Harberger (1954). The student will have an appreciation of the variety of ways that market power may lead to welfare losses. also be able to explain the derivation of the Lerner index and be able to compute it given appropriate data.

Suggested Lecture Outline:

Spend two fifty-minute long lectures on this chapter.

Lecture 1:

1. Measures of Market Structure
2. Concentration Curves and Ratios
3. Herfindahl Index
4. North American Industry Classification System (NAICS)
5. Measurement Problems

Lecture 2:

1. Measures of Market Power
2. Lerner Index
3. Empirical Measures of Monopoly-Induced Market Distortions
4. Role of Key Assumptions such as Elasticity Parameter and Cost-Minimization in In Measuring the Impact of Monopoly Power

Suggestions for the Instructor:

1. The best way to present the various concentration measures is to use examples from various industries with which the student can identify. Students relate much better to real world industries as compared to hypothetical concentration measures.
2. The easiest way to emphasize the difference between the CR_4 and HH measures is by example. Use one where the first four firms have 70% and the remaining 30% is spread evenly over 20 firms. Also consider one where the first firm has 50% and the next 3 have 10% each as compared to one where the first four firms have 20% each.
3. A solid discussion on the definition of a market is important here. Talk about close and distant substitutes and complements. Soft drinks as compared to all drinks (including beer, wine and hard liquor) are a good example. Another example is fast food (McDonalds versus Burger King) and the general market for eating out as part of the market for food.
4. Have the students go look up the codes for a sample of industries or give them the codes and ask them to find the industries with which they are associated. The idea is not to learn the codes but to get used to looking for data. Much of this is available on the Internet.

Solutions to the End of the Chapter Problems:

Problem 1

(a)

$$CR_4^{FT} = 0.48 + 0.30 + 0.07 + 0.06 = 0.91 = 91\%$$

$$CR_4^{TP} = 0.30 + 0.20 + 0.16 + 0.12 = 0.78 = 78\%$$

$$CR_4^{PT} = 0.37 + 0.18 + 0.12 + 0.11 = 0.78 = 78\%$$

(b)

$$H^{FT} = .48^2 + .30^2 + .07^2 + .06^2 + .09^2$$
$$= .2304 + .0900 + .0049 + .0036 + .0081 = .3370$$
$$H^{TP} = .30^2 + .20^2 + .16^2 + .12^2 + .05^2 + .16^2$$
$$= .0900 + .0400 + .0256 + .0144 + .0025 + .0256 = .1981$$
$$H^{PT} = .37^2 + .18^2 + .12^2 + .11^2 + .04^2 + .18^2$$
$$= .1369 + .0324 + .0144 + .0121 + .0016 + .0324 = .2298$$

(c) Given the highest four-firm concentration ratio and a very high Herfindahl index, facial tissue is the most concentrated with 2 firms controlling 78% of the market.

Problem 2

a. $LI = \theta(HHI/\eta)$. If the firms collude and act as a monopoly, the Lerner Index will be $LI = 1/\eta$. Hence, in this case, $\theta = 1/\text{HHI}$.

b. Again, $LI = \theta(HHI/\eta)$. Under perfect competition, the Lerner Index is 0. Hence, in this case, $\theta = 0$.

c. Holding concentration or HHI constant, we might expect that as θ increases from 0 to 1/HHI, it indicates that the level of competition in the market is decreasing.

Problem 3

Given a downward sloping demand curve, Monopoly Air could probably fill the planes if it lowered its price. At issue here is the cost of production versus the price charged. In order to determine if this is a natural monopoly, it would be useful to have data on the demand function and the cost function for production of passenger miles. Only if one large firm can meet the market demand at cost less than two firms is there a natural monopoly.

Problem 4

We can write the Lerner index as follows

$$L = \frac{p - MC}{p}$$
$$= 1 - \frac{MC}{P}.$$

First note that prices and marginal costs are always positive. Then note that a profit maximizing firm will only operate at a point where $P \geq MC$. This means that the ratio MC/P is always less than one which means than L is always less than one and greater than zero.

Given that L is ≤ 1 it is clear than $\eta \geq 1$ for a monopolist. In particular,

$$L = \frac{1}{\eta}$$
$$L \leq 1$$
$$\Rightarrow \frac{1}{\eta} \leq 1$$
$$\Rightarrow 1 \leq \eta$$