

## MODULE 4A--FOOD INDUSTRY AND SUBSECTOR STUDIES

**NOTE (1999) - THE NOTES FOR THIS MODULE ARE BEING UPDATED AND THE REVISED VERSION WILL BE AVAILABLE SOON.**

- I. Objectives of this section of the course
  - A. Give students brief overview of the structure of key parts of the U.S. food system
  - B. Provide empirical applications of the food systems framework developed earlier in the course
  
- II. Overview of Food System
  - A. Schematic of various parts of food system (Overhead--Fig. 11.1 from Senauer et al.)
  - B. Relative contribution of various parts of food system to Value Added and Employment (Overheads--Figures 11-2 and 11-3 of Senauer et al.) Stress the importance of:
    - 1. Transportation, trade, and retailing, including major gains in VA in recent years;
    - 2. How more VA is contributed by eating establishments now than farming.
    - 3. Similar trends as 1-2 in Employment;
    - 4. Relative changes in employment--Shift in employment from farming and food processing/mfg to eating establishments, transportation, and retailing.
    - 5. Shift in productivity over time (attached table). Largest gains have been in food processing, while smallest have been in transportation, trade, & retail; and in eating establishments (most labor-intensive of these fields)
    - 6. Shift in share of consumer's bill going to different segments (Figs. 11-4 and 11.5 from Senauer)
      - a. Increasing marketing bill
      - b. Differing shares for at-home and away-from-home food

7. These shifts reflect historical evolution of system, as detailed in optional readings and the old notes (MOD4A.OLD).

III. Empirical Evaluation of system performance

A. Subsector approach (see reading by Holtzman et al.)

B. Evaluating Industry performance via SCP approach

1. Most focus has been on pricing behavior, based on basic hypotheses derived from monopoly or oligopoly theory, i.e.,
  - a. More concentrated industries are characterized by barriers to entry, that allow incumbent firms to restrict output and raise prices (on output side) or reduce input purchase prices (on processing side)
  - b. Forms of barriers to entry often measured and relationship with market structure evaluated--e.g., relationship between advertising and market concentration (conduct-structure relationship) - see old notes for examples.
  - c. Most common--Attempt to link structure either to conduct (pricing) or performance (profit levels or prices received by buyers/sellers)
2. Examples:
  - a. Pricing differentials between national brands and unbranded products or store brands.
    - (1) See Marion example
    - (2) Hypothesis--price differential due purely to advertising-based consumer franchise.

- (3) Econometric evidence supports view that prices are significantly higher in those parts of food manufacturing that have higher concentration and more product differentiation.
          - (a) Typically, these price differences are measured by the differences between private label and national brands of equal quality.
          - (b) Degree of price elevation due to branding from 1 to 30%  
(Handout--Table 4-5 from Marion et al.)
  - C. Development of Game-theoretic models to study firm pricing strategies. (Koontz example).
- IV. Evaluating Profit performance using SCP approach
- A. Practical problems of developing norms for use of profits as a performance norm--see earlier discussion of IO model
  - B. In practice, we look at accounting profits, which include 3 components:
    - 1. Normal returns to equity capital
    - 2. Windfalls due to unanticipated changes in supply and demand
    - 3. Rents
      - a. Pure rents--returns from access to superior, more productive resources or from using available resources more efficiently than rival firms
      - b. Monopoly rents, both socially-sanctioned (e.g., patent rights) and those arising from market power.
  - C. Determinants of profit levels (see Marion et al. for discussion of econometric results)

1. Remarkably consistent results showing that accounting profits and cost-price margins positively related to CR4, relative market share, and advertising intensity (overhead--figure 4-12 from Marion et al.)
  2. Debate over whether higher profits reflect lower costs and greater efficiency or simply market power (Demsetz argument--Chicago school). Implications for policy. --> need to look at how prices vary relative to costs.
    - a. If prices increase by less than profits with increased concentration, this implies falling costs and net social gain.
    - b. If prices increase by more than profits, this suggests higher costs due to X-inefficiency, and hence net social losses from the higher concentration.
- D. Another example--Food retailing and effects of concentration--Econometrics work of Mueller and Connor
1. Background to the study
    - a. Following wage and price controls of early 1970s and a lot of concern about rising food prices, Congress established the Joint Economic Committee, with subpoena power.
    - b. Got data from 14 firms (114 divisions) on profits and price data from 3 firms operating in 35 SMSAs on prices.
    - c. Used econometric analysis to look at relationship between absolute concentration (as measured by CR4), relative concentration (as measured by RFMS--relative firm market share =  $(\text{Firm } i\text{'s market share})/\text{CR4}$  and:
      - (1) Profit levels
      - (2) Price levels

d. Results

(1) Profits

- (a) Positively related to CR4
- (b) Positively related to RFMS

(2) Prices

- (a) Increased with both CR4 and RFMS
- (b) Increased more than profits--i.e., higher profit levels accounted for only 36% of the higher price levels.--I.e., more concentrated markets have higher costs. (i.e., not economies of size or greater efficiency)--**Overhead of table from UW handout showing prices up to 8% higher in more concentrated markets.**

(3) So, consumers in concentrated markets pay more both due to higher costs and higher profits.

(4) Yet many SMSAs continue to be competitively structured.

V. So what--Why are we worried about concentration--Is the cost of monopoly that great to society?

A. Concept of monopoly overcharge

Competitive Solution:

Total Utility =  $DOQ_C E$

Total consumers' payment =  $P_C OQ_C$

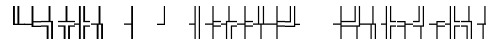
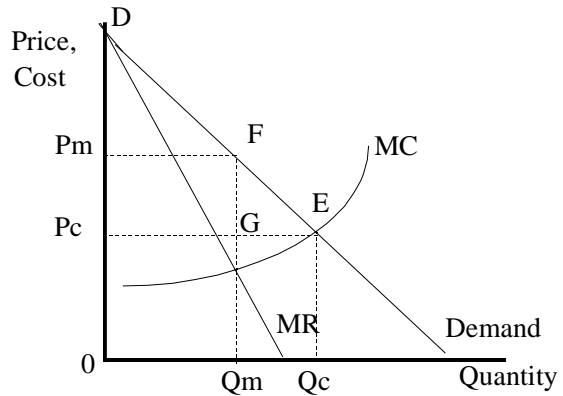
Consumers' Surplus =  $DP_C E$

Monopoly Solution:

Total Utility =  $DOQ_M F$

Total consumers' payment =  $P_M OQ_M F$

Consumers' Surplus =  $DP_M F$



Thus, with monopoly, consumers' surplus is reduced by  $P_M P_C E F =$  Monopoly Overcharge. This has two components:

$P_M P_C G F =$  Monopoly profits

$F G E =$  Dead Weight loss

B. Net level of Overcharge estimated at roughly \$10-12 billion/year in 1975, and deadweight loss to the economy of approx. \$500/year.

1. Problems with this method, based on consumer surplus.
2. Income Redistribution

- a. The above graph indicates that in addition to a deadweight loss, there is large redistribution of income between consumers and owners of food industries due to consumer overcharges. Redistribution of income roughly 20 times the level of deadweight loss to the economy, although economists often pay little attention to it (assuming it is just a transfer). But from a policy perspective it is probably more important than the deadweight loss.
  - b. Such redistribution is highly regressive, since the poor spend a higher proportion of their income on food than do the rich.
    - (1) Parker-Connor estimate consumer overcharge at 10%.
    - (2) This is the equivalent of 1.1% of gross income for poor households (<\$10,000/hh in 1975) and 0.7% for rich households (>\$60,000/hh)
- C. Other aspects of performance--e.g.,
1. Technological performance
    - a. Paradox of fairly rapid innovation in food industry with Very little R & D expenditure, and it has declined over time.--Tied with apparel manufacturers for the lowest ratio of R&D expenditures to sales in all of manufacturing.
    - b. Most innovations (over 90%) come from outside the food industry--e.g., from equipment manufacturers and from public research).
    - c. Relationships among size, concentration, and R & D

- (1) Regression analysis does **not** support the hypothesis that substantial market power and large firm size promote R & D.  
Rather,
    - (a) Increasing returns to R & D occur up to firm asset size of \$125 million (1970 \$), then decrease. Almost 200 food manufacturers were larger than this size.
    - (b) R & D outputs increase until CR4 reaches 50-60%, then decrease.
  - (2) Many innovations come from small firms, that are then bought out by the large firms.
- d. Implications for public policy
- (1) Need to keep a size mix in food industry to promote innovation
  - (2) Hypothesis that you need large near monopolies to promote innovation is not supported by the evidence.
2. Food advertising, consumption patterns, and nutrition
- a. Concerns about how food advertising affects nutrition
    - (1) Low information content for "empty calorie" products--sale of imagery rather than content
    - (2) Advertising aimed at children promoting heavily sugared foods, especially breakfast cereals. Now some restrictions on quantity of children's television advertising.

- (3) Misleading nutritional claims--e.g., FDA actions against cooking oil producers who advertise "no cholesterol" and use heart symbols, without revealing that product has high saturated fat.
- b. Food advertising and obesity--Some statistical evidence of the association of advertising intensity with change in quantity and composition of U.S. diet, but hard to sort out intervening variables.
- c. Potential for advertising to promote nutrition, but part of the problem is that most nutritious foods tend to be unprocessed, which are hard to differentiate.--Role for public education, esp. when many health care costs are borne socially rather than individually.