Notes for Chapter 8: Competitors & Competition

Four major structures: monopoly, oligopoly, monopolistic competition & perfect competition

Some commonalities of 2 or more of these forms of industrial organization:

a. A firm in any structure ALWAYS maximizes \( \pi \) by producing where \( MR = MC \).

b. **Entry** occurs in monopolistic competition & perfect competition till \( \pi = 0 \), unless Ricardian rents are possible.

c. Monopoly & oligopoly usually can **prevent entry**.

d. Oligopolies & monopolistic competitors usually have to be aware of other firms' competitive strategies.

e. Oligopolies may have differentiated products; monopolistic competitors **DO** have differentiated products.

1. Identifying your firm’s competitors

   a. **DOJ definition:** All competitors have been identified if a merger of any 2 firms “would lead to a small but significant non-transitory increase in price” (SSNIP) – with small defined as less than or equal to 5%; and non-transitory defined as a duration of at least one year.

   b. Suggested by SSNIP: a price increase by one competitor results in customers switching to the substitute. That is, the cross-price elasticity of demand is positive:

\[
\eta_{yx} = \frac{\% \Delta q_y}{\% \Delta P_x} > 0
\]

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Price elasticity of demand for beer \(-0.23\)

Cross-price elasticity of demand vs. beer and wine \(0.31\)

Cross-price elasticity of demand between beer and spirits \(0.15\)
Close substitutes tend to meet these 3 conditions:

1) Similar product performance characteristics
2) Similar or same uses
3) Sold in the same geographic markets (where geographic market matters)

*Catchment area:* the contiguous area from which customers are drawn

*Flow analysis:* data on customer travel patterns

2. **Measuring market structure:**

   *N*-firm concentration ratio: combined market share of the N largest firms in the industry

   - DOJ & FTC focus on the amount of sales of the top 4 firms, the 4-firm concentration ratio. (See table 8.1, p. 210.)
   - But more than that, DOJ & FTC focus on the Herfendahl index, the sum of the squares of the top 4 firms.

**HERFENDAHL MEASURE OF CONCENTRATION**

*(with % as whole numbers, not decimals)*

1 firm, 100% market share (a monopoly):  
\[ HI = 100^2 = 10,000 \]

2 firms, each with a 50% market share:  
\[ HI = 50^2 + 50^2 = 5,000 \]

4 firms, with market shares of 30%, 30%, 20%, and 20%:  
\[ HI = 30^2 + 30^2 + 20^2 + 20^2 = 2,600 \]

10 firms, each with market shares of 10%:  
\[ HI = 10(10^2) = 1,000 \]

- Post-Merger HHI **Below 1,000.** *These markets are not concentrated, so mergers in them are not challenged.*

- Post-Merger HHI **Between 1,000 and 1,800.** *These markets are moderately concentrated.* Mergers that raise the HHI by less than 100 will probably not be challenged. **Mergers that raise the HHI by more than 100 may be challenged.***
- Post-Merger HHI **Above 1,800.** *These markets are highly concentrated.*
  - Mergers that increase the HHI by less than 50 points will not be challenged.
  - Mergers that increase the HHI by 50 to 100 points may be challenged.
  - Mergers that increase the HHI by more than 100 points will be challenged.

3. **Market structure & competition**
   a. Perfect competition
      i. Percentage contribution to margin (PCM) = \(\frac{P - MC}{P}\)
      ii. To maximize \(\pi\), PCM = \(\frac{1}{\eta}\)
      iii. In perfect competition \(\eta\) is infinitely large, so PCM = 0. This means that P = MC.
      iv. Market conditions that tend to drive down prices:
         1) Many sellers
            a) Diversity of costs with low-cost sellers driving down the P
            b) Higher prices will result in lower quantities demanded, which will mean less production for some. This makes it difficult to forge agreements on raising prices.
         2) Consumers don’t perceive differences in product/service from different vendors. So a firm would need to lower prices to attract more customers. More sales come from:
            a) Current customers buy more from same vendor than previously planned
            b) Sales to new customers who weren’t in the market at higher prices
            c) Sales to customers who switch from other vendor to get lower P

*Example:* customers who switch to discount stock brokers
3) Excess capacity exists in physical plant – relative to current demand

a) Issue with firms with high fixed costs, in which MC at current output is far below AC. In this situation, the firm should attempt to produce and sell more output as long as P > AVC.

b) In the long run, if demand hasn’t increased significantly, this degree of competition will force out the less efficient firms as long as plant costs are not industry-specific, that is, as long as all fixed costs aren’t sunk. If they are sunk, then firms may try to hang on till the plant reaches the end of its useful life.

Example 8.4: Tyson beef processing plant in Emporia, KS

Other examples: Firms and plants that went belly-up in this last recession

b. Monopoly

i. An industry is generally considered a monopoly if the largest firm accounts for 60-70% of market share. That is the size that seems necessary to not be concerned about the pricing decisions of other firms.

ii. MR < P, because the monopoly must reduce price in order to sell more units.

iii. Example on p. 217 shows how to figure out the P the firm should charge and the Q it should produce. That is, it chose Q at the point where MR = MC, and it goes to the D curve to find out the P for that Q. In order to do this, one uses differential calculus. Any concerns? Any questions?

iv. Harold Demsetz’ research indicates that monopolies aren’t bad, per se. A monopoly arises when a consumer need is unmet or when a new technology is used to produce so much more efficiently that it makes all other suppliers obsolete.

v. Several firms acting as one is called a cartel – or, in the USA, a collusion, which is prohibited here and in most developed nations. So cartels are international. Very few are successful in the long run.

Examples of successful cartels: DeBeers & OPEC
c. Monopolistic competition

i. Many sellers

ii. Differentiated products/services/locations

iii. *Vertical differentiation:* product or service is unambiguously better or worse than other competing products/services – pricing accordingly

iv. *Horizontal differentiation:* only a portion of consumers prefer it to other competing products/services/locations

1) *Idiosyncratic preferences* allow such firms to increase prices to some extent, without losing customer loyalty.

2) Location is very important to horizontal differentiation.

3) Search costs are also very important. Advertising can be effective in combating horizontal differentiation.

4) Word-of-mouth is also very important, especially for professional services.

v. Given that $\eta$ is less than in perfect competition, firms in monopolistically competitive markets will have $P > MC$. And they can earn positive economic $\pi$, which will attract entry.

vi. Long run: Entry into monopolistically competitive markets will erode market shares to the point where $\pi = 0$.

d. What determines market structure: Level(s) of output that must be reached for minimum efficient scale (MES) Note: The level of output necessary for MES depends on the current technology.
e. Sutton’s endogenous sunk costs; in consumer goods markets, there tend to be only a few large firms and a large number of small firms.

i. Production costs do not seem to be the important factor; costs of advertising seem to be the important factor.

ii. In the evolution of an industry, a few firms use advertising to develop brand recognition, which is to the firm a form of capital. Many consumers depend on brand names in purchasing decisions. This is the endogenous sunk cost – the cost of developing brand recognition.

iii. Smaller firms can attempt to join in brand-name competition, but this is quite costly and risky.

iv. Most small firms instead differentiate themselves to sell in niche markets.

d. Oligopoly

Barriers to entry are the key to maintaining oligopoly power.
Managing oligopoly is difficult, because decisions on prices, output, investment and advertising must be made strategically – always concerned about the responses of rival firms.

i. Oligopolies in non-cooperative situations: We study these using game theory.

Nash equilibrium: Each firm does the best it can, given what its competitors are doing. (1951) The Nash equilibrium is based on non-cooperative solutions, where collusion is illegal.

The Prisoners’ Dilemma explains why firms that know the P and Q that would maximize total \( \pi \) won’t do so in the absence of collusion, and why sometimes actual collusion that’s not enforceable will cause firms to ignore the collusive agreement.

Non-cooperative game: game in which it isn’t possible for parties to negotiate or enforce binding contracts

With more than 2 firms, the interactions are a lot more complex – can be worked out in dynamic computer models, but that’s beyond the scope of this course.
**Payoff matrix**: table that shows the payoff to each of two parties that results from the actions of both parties

If the decision to collude is **NOT enforceable**, it’s in the best interest of each party – provides the largest payoff, to select the Nash outcome; to be better off no matter what the other one does.

ii. **Implications of the prisoners’ dilemma for oligopolistic pricing**

**Prisoners’ dilemma**: No matter what the other prisoner does, the prisoner being questioned is better off by confessing – **EVEN IF SHE HASN’T COMMITTED THE CRIME!**

This illustrates the problem faced by a firm - better off with cooperation **IF ALL Cooperate**, but better off by undercutting if just one other firm were to decide to undercut the others.

Firms *over time* can learn from observation whether they can trust the other oligopolists in their market. So the outcome need not be the same as in the Prisoners’ Dilemma.

**Price rigidity**: characteristic of oligopolistic industries with implicit cooperation, in which firms are reluctant to change P even in the face of a change in D or costs

Description of P rigidity: **Kinked D curve** – Firms’ belief that if they alone increase P, this act will cause them to NOT be able to sell as much – as other firms continue to hold their lower P’s; but if they lower P, other firms will follow, so that their lower in P yields little change in sales.

Price signaling and price leadership – In some industries, one firm will emerge as the **price leader**: Its changes in P are followed by others. In other industries, firms may share the price-signaling role.

Airlines have in the past taken turns in raising prices, with the others following within a day or two. American Airlines usually plays this role.
**Dominant firm model** – Describes an industry with one large firm and many “fringe” firms.

The dominant firm needs to know the portion of the $D_{mkt}$ curve that is its own $D_D$ curve. With this info, the firm selects $Q_D$ and $P_D$ so that its $MR_D = MC_D$.

The other firms act as perfect competitors, viewing $P_D$ as the competitive $P$.

iii. Cartels

They form to increase profits – ideally acting as a monopoly (see graphs, p. 447)

The incentive to cheat is strong for at least 2 reasons:
1) If members are of different sizes or face different costs, some may become discontented about their individual $\pi$’s, especially if others are reaping much larger $\pi$’s
2) One cheater who can go relatively unnoticed can undercut the cartel price & potentially earn a much larger $\pi$.

Necessary conditions of cartel success:

1) Control of a significant share of the market

2) No government interference

3) Greater incentives to fall in line than to cheat

In the US: Sherman Antitrust Act (1890) & Federal Trade Commission Act (1914) make cartels illegal.

*Examples: OPEC, “catwalk cartel,” copper cartel attempt*