Market Structure and Horizontal Mergers

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Market Structure

Market structure can be broadly classified into perfect competition, monopolistic competition, oligopoly, and monopoly.

- A perfectly competitive industry has several features as below:
  1. Atomistic firms;
  2. Homogeneous product;
  3. Perfect information;
  4. Free entry and free access to technology.
- A monopoly is an industry structure in which only one firm provides a good or service that has no close substitute.

Market Structure

- Monopolistic competition describes a market with the following attributes:
  1. Many firms;
  2. Product differentiation;
  3. Free entry and exit.
- Oligopoly is defined as a market structure in which only a few firms offer similar or identical products.

Measuring Market Concentration

- Since different firms have different market shares in the real economy, information regarding industry concentration matters.
- A simple firm count $(1/n)$ misses out the important information.
- An alternative to counting the number of firms is to measure the coefficient C_m, the sum of the market shares of the largest m firms. In particular,

$$C_4 \equiv \sum_{i=1}^{4} s_i$$

  where firms are ordered by market shares.
- Another alternative measure of market concentration is the Herfindahl-Hirschman index (HHI), which is given by:

$$H \equiv \sum_{i=1}^{n} s_i^2$$

Measuring Market Concentration

- The price cost margin is fine if all firms have the same costs. If costs vary from firm to firm, then so do margins.
- What is then market power in the industry as a whole?
  - The natural generalization of the margin is the Lerner index, defined as the weighted average of each firm's margin, with weights given by the firm's market share:

$$L \equiv \sum_{i=1}^{n} s_i \frac{p - MC_i}{p}$$

  - If all firms have the same marginal cost, then the Lerner index is simply the margin set by all firms.

Horizontal Mergers

The Profit Effect of Mergers

- Suppose that there are three firms, all with marginal cost $c_i = c$; and that Firms 2 and 3 merge, forming a new Firm 2 with cost function is $C = F' + c'q$, where $c' < c$.
- There are three interested parties in the merger:
  1. the merging firms (Firm 2 and 3)
  2. the rival firm (Firm 1)
  3. consumers
- Suppose that market demand is given by $p = a - bQ$, where $Q = \sum_i q_i$.

Horizontal Mergers

The Profit Effect of Mergers

- Each firm's pre-merger profit under Cournot competition is given by:

$$\pi_1 = \pi_2 = \pi_3 = \left(\frac{a-c}{4}\right)^2 - F$$

- After the merger, the new Firm 2 has a profit of:

$$\pi_2' = \left(\frac{a+c-2c'}{3}\right)^2 - F'$$

- It follows that the combined profit of the merging firms changed by:

$$\pi_2' - (\pi_2 + \pi_3) = (2F - F') + \left(\frac{a+c-2c'}{3}\right)^2 - 2\left(\frac{a-c}{4}\right)^2$$

Horizontal Mergers

The Profit Effect of Mergers

- There are four different effects to consider.
  1. Fixed costs savings: to the extent that $F' < 2F$, the merger implies fixed cost efficiencies.
  2. If $c' < c$, then $a + c - 2c' > a - c$.
     In other words, the more efficient a firm is, the greater its profits are.
  3. A merger implies a decrease in the number of competitors from 3 to 2. Fewer competitors imply less competition, which in turn translates into higher profits.
  4. By merging two profits are turned into one. In fact, if $F = 0$ and $c = c'$, such that there are no cost efficiencies, then the merging firms' change in profits is given by:

$$\pi_2' - (\pi_2 + \pi_3) = \left(\frac{a-c}{3}\right)^2 - 2\left(\frac{a-c}{4}\right)^2 = (a-c)^2\left(\frac{1}{9} - \frac{2}{16}\right)$$

     which is negative.

Horizontal Mergers

Merger Effect on Non-merging Firms

- Firm 1's profit, after the merger, is given by:

$$\pi_1' = \left(\frac{a + c' - 2c}{3}\right)^2 - F$$

- The difference with respect to pre-merger profit is given by:

$$\pi_1' - \pi_1 = \left(\frac{a + c' - 2c}{3}\right)^2 - \left(\frac{a - c}{4}\right)^2$$

Horizontal Mergers

Merger Effect on Non-merging Firms

- There are two effects to consider.
  1. To the extent that $c' < c$, the numerator of the variable profit function is lower after the merger: $a + c' - 2c < a - c$. In other words, the non-merging firm loses from the merging firms' efficiency improvement.
  2. The denominator of the variable profit function is greater when the number of firms is decreased: the merger implies one firm less, and fewer competitors implies higher profits for everyone, including non-merging firms.