ECN 453: Horizontal Mergers 1

Nicholas Vreugdenhil

Horizontal Mergers

- **Merger**: When two firms become one.
- **Horizontal Mergers:** Mergers between two firms in the same industry
  - Phillip Morris and Kraft (food products)
  - Nestle and General Mills (breakfast cereals)
  - InBev and Anheuser-Busch (beer)
- **Vertical Mergers:** Mergers between two firms at different stages of the value chain
  - e.g. Gasoline Refinery and a Gas Station
- In this course, we will not focus on some other forms of mergers e.g. conglomerate mergers

Largest merger and acquisitions as of 2014

Rank	Year	Acquiror	Target	$ b	€b
1	1999	Vodafone AirTouch PLC	Mannesmann AG	202.8	204.8
2	2000	America Online Inc	Time Warner	164.7	160.7
3	2007	Shareholders	Philip Morris Intl Inc	107.6	68.1
4	2007	RFS Holdings BV	ABN-AMRO Holding NV	98.2	71.3
5	1999	Pfizer Inc	Warner-Lambert Co	89.2	84.9
6	1998	Exxon Corp	Mobil Corp	78.9	68.4
7	2000	Glaxo Wellcome PLC	SmithKline Beecham PLC	76.0	74.9
8	2004	Royal Dutch Petroleum Co	Shell Transport & Trading Co	74.6	58.5
9	2000	AT&T Inc	BellSouth Corp	72.7	60.2
10	1998	Travelers Group Inc	Citicorp	72.6	67.2

Plan

1. Why do firms merge?
2. Determining the effects of mergers.

Plan

1. **Why do firms merge?**
2. Determining the effects of mergers.

Why do firms merge?

- Sony and Columbia: "synergies"; Columbia's collection of movies was seen as a guarantee of a minimum supply of 'software' to complement the 'hardware' offered by Sony

- Philip Morris and Kraft: sell food products to supermarkets; merger allowed firms to increase bargaining power with respect to retailers

- Nestle and Rowntree: Allowed Nestle to enter a new market for chocolate (UK), avoiding high cost of launching new brands (Rowntree owned KitKat, Smarties, etc)

- Nestle and General Mills: Distributional efficiencies in breakfast cereals; Nestle great at distribution, General Mills leader in production.

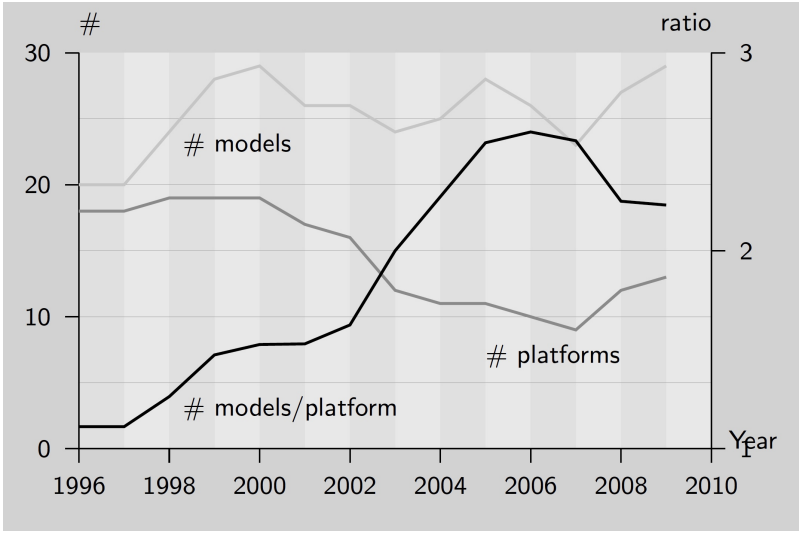
Economic effects of horizontal mergers

- **Cost efficiencies/savings**
  - Fixed costs e.g. reduce duplication
  - Variable costs e.g the Nestle and General Mills example from before
- **Market power**
  - Unilateral effect (market has less competition)
  - Coordination effects (easier to sustain collusion)
- **Mergers normally imply an increase in prices and a reduction in costs.**
- Regulators need to decide whether to approve mergers:
  - Test: do the positive effects of efficiencies outweigh the negative effects of market power?

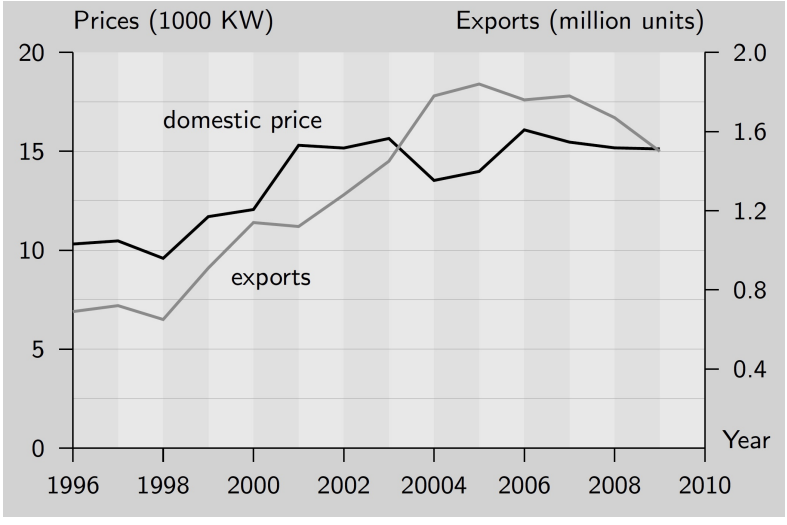
Case study: Hyundai-Kia Merger

- Context:
  - 1997 Asian financial crisis.
  - Every Korean automaker except Hyundai (Kia, Daewoo, Sangyong, Samsung) fell into financial distress.
  - Kia declared bankruptcy in 1997, was acquired by Hyundai
- Idea:
  - Merge for cost efficiencies. Consolidate production and take better advantage of scale economies.
  - E.g. reduce number of platforms (underbody/suspensions with axles)
- Expect:
  - Negative effects - greater market power in domestic market
  - Positive effects - greater cost efficiencies, more competitive in export markets

Case study: Hyundai-Kia Merger



Case study: Hyundai-Kia Merger



Plan

1. Why do firms merge?
2. **Determining the effects of mergers.**

Determining the effects of mergers: useful formulas

- **Setup**
  - Firm i's cost: $C_i = F_i + c_i q$
  - Market demand: $D = a - p$
  - Cournot competition with n firms.
- Then, profits and consumer surplus are:

$$\hat{\pi}_i = \left(\frac{a - nc_i + \sum_{j \neq i} c_j}{n+1} \right)^2 - F_i$$

$$CS = \frac{1}{2} \left(\frac{n}{n+1} \right)^2 \left(a - \frac{1}{n} \sum_{i=1}^{n} c_i \right)^2$$

- Note: $\sum_{j \neq i} c_j$ is 'sum of all other firms' marginal costs'
- Note: $\sum_{i=1}^{n} c_i$ is 'sum of all firms' marginal costs'

Determining the effects of mergers: useful formulas

- We can derive the formulas on the previous slide using our 'usual method' for solving Cournot competition models.

- We've derived other formulas that are very similar, so I will just take these useful formulas as given, and use them directly for analysis.

Determining the effects of mergers

- **Setup:**
  - Initially, n=3, all firms: $C = F + cq$
  - Assume Firm 2 and Firm 3 merge $\rightarrow$ Firm 2&3.
  - Firm 2&3 has $C = F' + c'q$.
  - Merger efficiencies: $F < F' < 2F$, $c' < c$
- **Question:** What is the effect of the merger on:
  - 1. The merging firms?
  - 2. The non-merging firm?
  - 3. Consumers?

Determining the effects of mergers: solution

- **Question:** 1. What is the effect of the merger on the merging firms?
- Each firm's pre-merger profit:

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

- Firm 2&3's profit post-merger:

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

Determining the effects of mergers: solution

- **Question:** 1. What is the effect of the merger on the merging firms?

- Change in profit (taking differences):

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

- Four effects on profits that this equation shows:
  1. Fixed cost savings $F' < 2F$ (positive effect)
  2. Marginal cost savings: if $c' < c$ then $a + c - 2c' > a - c$ (positive effect)
  3. Market power: number of firms $4 \to 3$ (positive effect)
  4. Exit: two profits are turned into one (negative)

Determining the effects of mergers: solution

- **Question:** 2. What is the effect of the merger on the non-merging firms?

- Firm 1's profit after the merger:

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

- Change in profit (taking differences):

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

- Effects:
  1. Rival is more efficient: if $c' < c$ then $a + c' - 2c < a - c$ (negative effect)
  2. Market power: $2 < 3$ (positive effect)

Determining the effects of mergers: solution - effect on outsiders, examples

- Oil industry: BP acquired Amoco. As a result, Mobil's stock price increased by $2.625 after the announcement

- Hard drive industry: in March 2011, Western Digital announced it would buy Hitachi (number 1 and 2 suppliers of disk drives). Stock prices of Seagate (third largest supplier) grew by 9 %.

- Airline industry: British Airways and American Airlines announced a proposed merger. As a results, Virgin Atlantic painted its aircraft with

- **The value of non-merging firms may decrease or increase as the result of a merger, depending on the cost efficiencies generated by the merger.**

Determining the effects of mergers: solution

- **Question:** 3. What is the effect of the merger on consumers?

- Change in consumer surplus (taking differences):

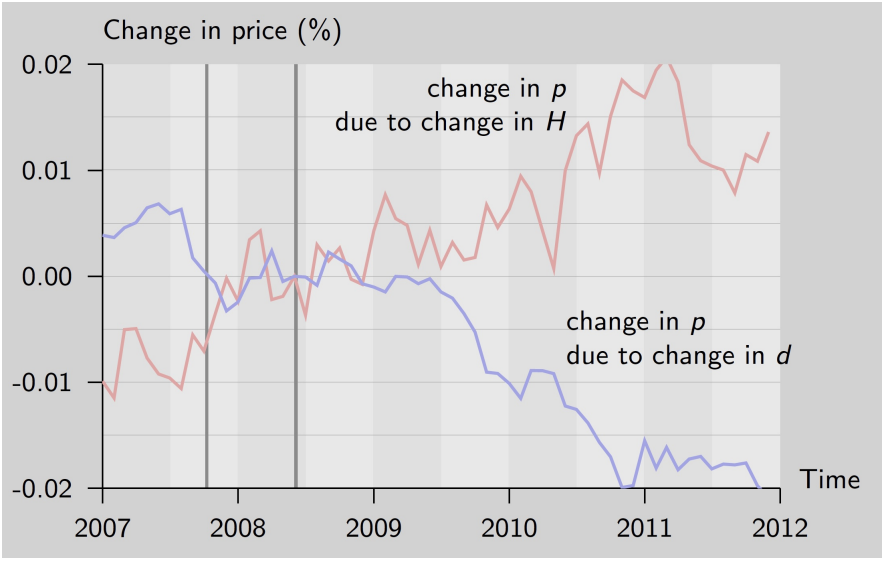
$$CS' - CS = \frac{1}{2}\left(\frac{2}{3}\right)^2 (a - \frac{1}{2}(c + c'))^2 - \frac{1}{2}\left(\frac{3}{4}\right)^2 (a - c)^2$$

- Effects:
  1. Part of the merger's cost reductions are passed on to consumers: if $c' < c$ then $a - \frac{1}{2}(c + c') > a - c$ (positive effect)
  2. Market power: the factor $\frac{2}{3} < \frac{3}{4}$ decreases due to number of firms $3 \to 2$ (negative effect)

Case study of merger effects: Miller-Coors joint venture

- October 2007: Miller and Coors (2nd and 3rd largest firms in US beer industry) announced they would merge.
- Result in cost savings but also less competition.
  - Before merger: Coors brewed in 2 locations, Miller in 6 locations
  - After merger: Coors beer production moved into Miller plants, lowering shipping costs
- Due to the potential cost savings, Department of Justice approved the merger. Was this the right decision?
- On next slide, look at price changes in:
  - markets where Herfindahl index increased more (H)
  - markets where shipping distance decreased more (d)

Case study of merger effects: Miller-Coors joint venture



Summary of key points*

- Mergers usually involve a public policy tradeoff: lower costs vs increased market power
- Know the formulas for profit and consumer surplus and how to use them to compute the effect of the merger on:
  - The merging firms
  - The non-merging firms
  - Consumers
- Know how the above effects increase or decrease as a result of a merger, and depend on the parameters of the problem.

*To clarify, all the material in the slides, problem sets, etc is assessable unless stated otherwise, but I hope this summary might be a useful place to start when studying the material.