

# 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.
3. Horizontal merger policy

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

# Plan

1. Why do firms merge?
2. **Determining the effects of mergers.**
3. Horizontal merger policy



## 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  $4 \rightarrow 3$  (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):

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

- 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  $3 \rightarrow 2$  (negative effect)



# Plan

1. Why do firms merge?
2. Determining the effects of mergers.
3. **Horizontal merger policy**

## Horizontal merger policy

- Three interested parties in a horizontal merger: merging firms, non-merging firms, and consumers.
- Task for public policy: evaluate the relative importance of each gain/loss, and to assess the overall effect.
- This is very challenging! E.g. information about cost savings comes from the firms themselves, usually, and they have a clear incentive to overstate the benefits.

## Horizontal merger policy

- Also important to merger analysis: what is the increase in price following a merger?
- From our previous discussion about market structure, equilibrium price is increasing in market concentration.
  - Two large firms merging implies a greater increase in price than two small firms.
- Price increase channels:
  - **Unilateral effects** (less competition)
  - **Collusion effects** (easier to collude with fewer firms)

# Horizontal merger policy: practical aspects - summary

Table from 2023 Horizontal Merger Guidelines

Indicator	Threshold for Structural Presumption
Post-merger HHI	Market HHI greater than 1,800 AND Change in HHI greater than 100
Merged Firm's Market Share	Share greater than 30% AND Change in HHI greater than 100

## Horizontal merger policy: practical aspects

- **What is the relevant 'market'?**
- To compute the HHI, need to define market shares. What is the denominator in the 'share'?
- Definition of market is an obvious way for firms to skirt merger enforcement: try to define the market as large as possible.
- Example: 1996 Staples and Office Depot (two largest US chains of office supplies superstores) proposed a merger.
  - If market is 'office superstores': combined market share of merging parties is  $> 70\%$ .
  - If market is 'stores that sell office supplies': combined market share is much lower.
- To get around these debates about market definition, recently FTC has favored a more direct approach of estimating the impact of a merger on consumer prices.

## Horizontal merger policy: merger remedies

- In the US, mergers are challenged in court.
  - That is, regulators do not block them directly. In the EU, the European Commission blocks mergers directly and this can then be appealed in court.
- Possible outcomes:
- **Behavioral remedies:** e.g. prices cannot be increased by  $x\%$  during the next  $n$  years
- **Structural remedies:** e.g. sell assets to competitor
- Merger might be blocked
- Merger might be allowed to go ahead

## 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.
- Know about two practical aspects of merger policy: 1. how regulators target enforcement based on concentration and 2. market definition

\*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.