Mergers

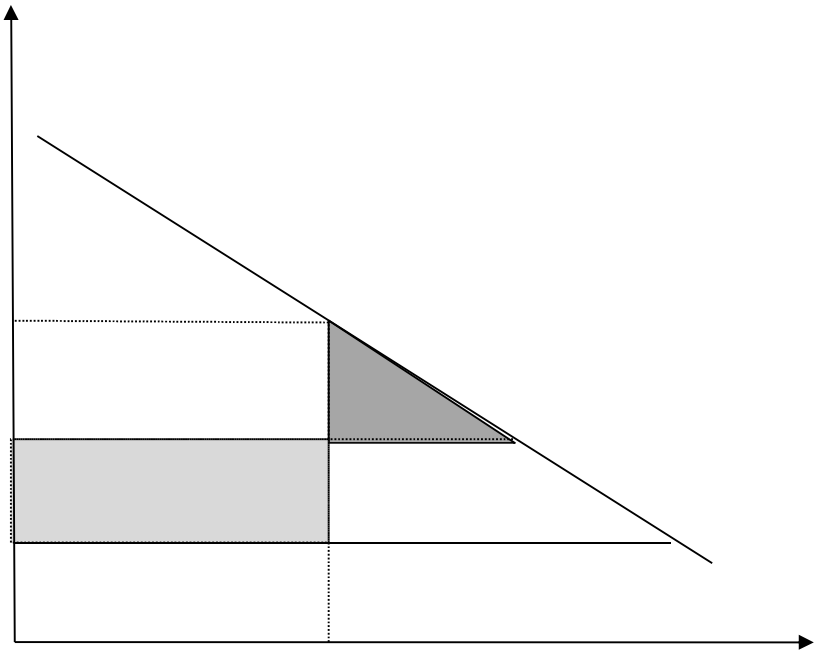
Why merge?

- Reduce competition – increase market power.
- Cost savings – economies of scale and scope.
- But necessary to merge in order to get bigger?
    - Input factors in total fixed supply.

Why allow mergers?

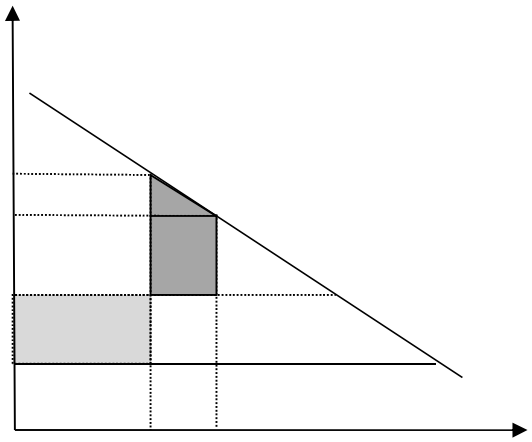
- Cost savings
    - Oliver Williamson: the efficiency defense

Williamson's point: It may not take a huge cost saving to dominate the deadweight loss from a merger.



But note:

- What if the pre-merger price is not competitive?



  - Larger cost savings needed to outweigh deadweight loss.

- Production reshuffling: More of the production in the industry will be made by the low-cost firm – an additional source of cost savings in the industry.

- What is the appropriate *welfare standard*?
  - consumer welfare standard
  - total welfare standard

- What are the long-term effects of the merger?
  - R&D, capacity investments, new products, etc.
  - collusion

Static effects of mergers

- *Unilateral effects*

- In general, welfare analyses of mergers are complex – even within rather simple models.
- An alternative: a sufficient condition for a merger to be welfare improving
- The Farrell-Shapiro criterion

A merger affects

- the merging firms
  - price
  - costs
- the non-merging firms
  - price
- consumers
  - price

When a merger is proposed, then – presumably – it is profitable for the merging firms. So the competition authority – when looking for a sufficient condition for a welfare-improvement – can limit the analysis to the merger's effect on

(i) non-merging firms, and
(ii) consumers

→ the *external effect* of a merger

Cost savings affect to a large extent only the merging parties. So focusing on the external effect, we do not need to assess vague statements about cost savings from a merger.

If the merger leads to a higher price, then non-merging firms benefit, and consumers suffer. But what is the total external effect?

A merger model with Cournot competition

X – total output in the industry
x_i – firm i's output
y_i – all other firms' output: $y_i = X - x_i$

Firm i's costs: $c_i(x_i)$
Inverse demand: $p(X)$

Firm i's first-order condition:

$$p(X) + x_i p'(X) - c_i'(x_i) = 0.$$

$\Rightarrow$

$$p(x_i + y_i) + x_i p'(x_i + y_i) - c_i'(x_i) = 0$$

Firm i's response to a change in other firms' output – total differentiation wrt x_i and y_i:

$$\frac{dx_i}{dy_i} = R_i = -\frac{p' + x_i p''}{2p' + x_i p'' - c_i''}$$

From which we find firm i's response to a change in total output:

$$dx_i = R_i dy_i \Rightarrow dx_i(1 + R_i) = R_i(dx_i + dy_i) = R_i dX$$

$$\Rightarrow \frac{dx_i}{dX} = \frac{R_i}{1 + R_i} = \frac{p'(X) + x_i p''(X)}{c_i''(x_i) - p'(X)} = -\lambda_i < 0$$

Welfare effects of a merger

Two sets of firms:

I – insiders

O – outsiders

An infinitesimal merger

- dX_I – a small exogenous change in industry output

Change in welfare from this merger:

$$dW = pdX_I - dc_I + \sum_{i \in O} [p - c_i']dx_i$$

- Changes in output assessed at market price p.
- c_I – insiders' total costs
- Note: $dx_i = -\lambda_i dX_I$ for each outsider firm
- From an outsider firm's FOC: $p - c_i' = -x_i p'(X)$
- The external effect of the merger: $dE = dW - d\pi^I$.
- The market share of a firm: $s_i = x_i/X$.

$\Rightarrow$

$$dW = (pdX_I + X_I dp - dc_I) - X_I dp + \sum_{i \in O} p'(X)\lambda_i x_i dX_I$$

$$dE = dW - d\pi^I = -X_I p'(x)dX_I + \sum_{i \in O} p'(X)\lambda_i x_i dX_I$$

$$dE = \left[\sum_{i \in O} \lambda_i x_i - X_I\right] p'(X)dX_I = \left[\sum_{i \in O} \lambda_i s_i - s_I\right] X p'(X)dX_I$$

Here, $p' < 0$ and, typically, $dX_I < 0$.
So the external effect of a merger (the accumulation of many infinitesimal mergers) is positive if and only if:

$$\sum_{i \in O} \lambda_i s_i > s_I \qquad !$$

→ An upper bound on the merging firms' joint (pre-merger) market share in order for their merger to improve welfare.

Examples

1. *A simple model: constant marginal costs, linear demand*

$c_i'' = 0$, $p'' = 0 \rightarrow \lambda_i = 1$.

Before merger: all firms of equal size. The external effect is positive if the set of merging firms is less than half of all firms:

$$s_I < \sum_{i \in O} s_i \Leftrightarrow m < n/2$$

- But: will such a merger be profitable?

2. *A more sophisticated model: merger between "units of capital".*

The Perry-Porter model.

Cost function: $C(x_i, k_i) = \frac{cx_i^2}{2k_i}$. Marginal costs: $\frac{\partial C}{\partial x_i} = \frac{cx_i}{k_i}$

Interpretation: *k* is an input factor that is in total fixed supply within the industry and not available outside the industry (such as "industry knowledge"). The only way for a firm to expand is to acquire *k* from other firms, such as through a merger. The more *k* a firm has, the lower are its costs – cost savings from mergers.

A merger between two firms with k_1 and k_2 units of capital creates a firm with $k_1 + k_2$ units of capital.

Also assume linear inverse demand: $P(X) = a - X$.

$\Rightarrow$

$$\lambda_i = \frac{k_i}{c + k_i}$$

FOC for firm *i*:

$$p + x_i p' - C'(x_i) = 0 \Leftrightarrow\ p - x_i - \frac{c}{k_i} x_i = 0 \Leftrightarrow\ p = \frac{x_i}{\lambda_i} \Leftrightarrow$$

$$\lambda_i = \frac{x_i}{p} = \frac{s_i}{\varepsilon}$$

(since $\varepsilon = -D'p/D = p/X$ when demand is linear)

The external effect is positive if:

$$s_I < \frac{1}{\varepsilon} \sum_{i \in O} s_i^2$$

- The size of the external effect depends on how concentrated the non-merging part of the industry is!
- A merger is more likely to be welfare-enhancing if the rest of the industry is concentrated.
- A merger among small firms leads to the other, *big*, firms expanding, which is good. (Production reshuffling)

<u>Criticism of the Farrell-Shapiro approach</u>

- The presumption that the merger is privately profitable may not be valid
    - Empire building
    - Tax motivated mergers
    - Pre-emption (or encouragement) of other mergers

Coordinated effects of a merger

- A merger's effect on collusion
- What effect does a merger have in an industry where firms collude? – On balance: unclear.
    - The merging firms now earn more and have reduced incentives to cheat on the collusive agreement after the merger – the merger makes collusion easier.
        - But the picture is complicated: merging firms are bigger and often bigger incentives to break out of punishment phases – thus making collusion more difficult.
    - The non-merging firms now earn more without collusion and therefore have increased incentives for breaking out of the collusive agreement after the merger – the merger makes collusion more difficult.

Regulating mergers

- Merger policy
- The welfare standard