Vertical mergers

Industrial organization – lecture 5

Vertical mergers

Vertical mergers join firms operating at different levels of production chain (e.g. producer and retailer).

What are the effects of a vertical merger compared to a horizonal merger?

Vertical mergers join firms producing complementary products. Internalization of this externality is Pareto improving.

Case:
In 2000 GE and Honeywell announced merger. GE produces jet engines, Honeywell produces starter motors and other inputs for aircraft engines.

In July 2001 the merger was blocked by EC. Why?

Double marginalization

Pepall et al. (2010, pp. 325–328)

What are the pro-competitive effects of vertical mergers?

- Each firm in a production chain provides an essential input to other firms in the chain.
- Firms on each level of the production chain have some market power.
- Firms on each level of the production chain charges some mark-up above marginal costs.
- The price for final consumers may be higher than the monopoly price.
- This problem is called *double marginalization*.

Double marginalization: Model

Pepall et al. (2010, pp. 325–328)

There is a single manufacturer m and single retailer r.

The producer produces the good at a constant unit cost c and sells it to the retailer at a wholesale price w.

The retailer resells the product to the final consumer at a final price P.

The inverse demand function is linear $P = A - BQ$.

Double marginalization: Solution

Pepall et al. (2010, p. 301-304)

Solution of the model is given by backward induction.

Profit maximizing price and output of the retailer for given wholesale price w are $Q(w) = \frac{A-w}{2B}$ and $P(w) = \frac{A+w}{2}$

Substituting the retailer's output into the profit function of the manufacturer and maximizing with respect to w gives the optimal wholesale price $w^* = \frac{A+c}{2}$.

The retailer's equilibrium output is thus $Q^* = \frac{A-c}{4B}$

Double marginalization: Solution

Pepall et al. (2010, p. 301-304)

After merger the whole industry is monopolized.

The profit maximizing output and price of the integrated firm are $Q^I = \frac{A-c}{2B}$ and $P^I = \frac{A+c}{2}$.

The merger results in a lower price, a greater quantity, higher profits, and a higher consumer surplus.

Two assumptions are crucial for this analysis

1. Fixed proportion between inputs and outputs
2. Linear pricing

Foreclosure

Pepall et al. (2010, p. 332-333)

There can be also anti-competitive effects of vertical mergers.

The most important one is foreclosure. *The integrated company may choose to deny a downstream competitor a source of inputs.*

Consider an industry with two independent manufacturers and two independent retailers.

- Is vertical integration profitable? Yes
- Can vertical integration harm the consumers? Yes

We illustrate the foreclosure logic in the model by Ordover, Saloner and Salop (1990).

OSS model

Pepall et al. (2010, p. 338-342)

There are two manufacturer m_i and two retailers r_i. Prices are, again, denoted as p_i and w_i.

The retailers' demands are $q_i^r = 1 - p_i + \beta p_j$ where parameter $\beta \in (0, 1)$ measures the degree of product differentiation.

Marginal cost are normalized to zero.

We solve the model in three versions:

1. Without merger
2. With merger and foreclosure
3. With merger and without foreclosure

OSS model: Retailer's subgame

Pepall et al. (2010, p. 338-342)

Profit of retailer i given it pays wholesale price w_i is

$$\Pi_i^r = (p_i - w_i)(1 - p_i + \beta p_j).$$

We derive best-responses and solve for retailers' prices.

The equilibrium price is $p_i^*(w_i, w_j) = \frac{2+\beta+2w_i+\beta w_j}{4-\beta^2}$ and the equilibrium quantity is $q_i^*(w_i, w_j) = \frac{2+\beta-(2-\beta^2)w_i+\beta w_j}{4-\beta^2}$

You can check that the equilibrium profit is $\Pi_i = (q_i^*(w_i, w_j))^2$

OSS model: Manufacturer's subgame

Pepall et al. (2010, p. 338-342)

Version 1: Manufacturers charges $w_1 = w_2 = 0$ because of Bertrand competition.

Version 2: Marginal cost of integrated firm is zero. Manufacturer 2 charges $w_2 = \frac{2+\beta}{2(2-\beta^2)}$.

Version 3: Manufacturers again behaves like Bertrand competitors resulting in $w_1 = w_2 = 0$.

Conclusion: The final prices increase if and only if the integrated firm can credibly commit to not deliver to competing retailer. If such a commitment is available integration raises rival's cost and final prices. However, existence of such a commitment is unlikely.

Foreclosure: GE-Honeywell merger

Pepall et al. (2010, p. 343-344)

It is a pretty famous and a very controversial case.

Citation of commission's report (par. 355):
Because of their lack of ability to match the bundle offer ... independent suppliers will lose market shares to the benefit of the merged entity and experience an immediate damaging of profit shrinkage. As a result, the merger is likely to lead to market foreclosure ... and to the elimination of competition in these areas.

Does it make sense?

Empirical evidence: Concrete industry

Pepall et al. (2010, p. 346-348)

Hortacsu, Syverson (2007, JPE) study the effect of vertical integration on prices.

Why concrete industry?

- Fixed proportion between input and output
- Variation in vertical integration
- High transportation cost creates many local markets. Many markets mean many independent observations.

Estimated equation $P_{it} = \alpha + \beta VI_{it} + \gamma X_{it}$, where
P_{it} is the average concrete price,
VI_{it} is the share of vertically integrated firms,
X_{it} are control variables (market and year fixed effects, HHI, ...)

Empirical evidence: Concrete industry

Pepall et al. (2010, p. 346-348)

Main results:

Variable			
Market share of VI firms	-0.09^*	-0.086^*	-0.043
Market share of multiple plant firms	-	-0.15	-0.001
Total factor productivity	-	-	-0.293^*
R^2	0.433	0.434	0.573

How do you interpret this?