Vertical mergers

Industrial organization – lecture 5

Vertical mergers

Pepall et al. (2014, pp. 427–428)

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.
Each firm's pricing decision imposes an externality on the other firm:
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. (2014, pp. 428–432)

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

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

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 and price are $Q^* = \frac{A-c}{4B}$ and $P^* = \frac{3A+c}{4}$.

Double marginalization: Solution

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. (2014, pp. 435-436, 441–446)

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

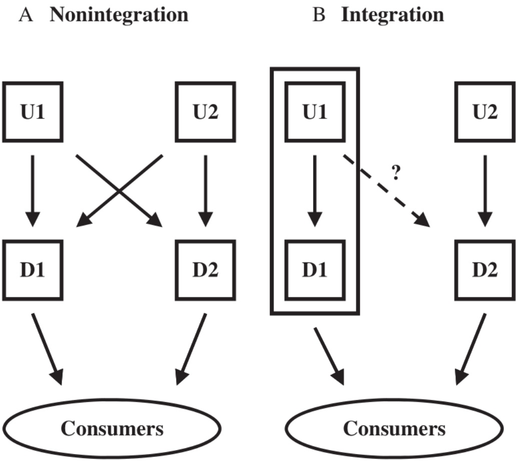
The most important one is foreclosure. *The integrated company may choose to deny a downstream competitor a source of inputs.*

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


A Nonintegration
B Integration
U1
U2
D1
D2
Consumers
U1
U2
?
D1
D2
Consumers

OSS model: experiment – nonintegration

The experiment simulates the choice of upstream firms (step 2).

The timing:

1. Choose price individually from $p \in [1, 2, \ldots, 9]$
2. Determine market price $p_M = min\{p^1, p^2\}$
3. Calculate profit

$$\pi^1 = \begin{cases} \text{Bertrand profit}(p_M) & \text{if } p^1 = p_M < p^2 \\ \frac{1}{2} \times \text{Bertrand profit}(p_M) & \text{if } p^1 = p_M = p^2 \\ 0 & \text{if } p^1 > p_M \end{cases}$$

THE PAYOFF TABLE FOR THE TREATMENTS WITHOUT VERTICAL INTEGRATION

Price	1	2	3	4	5	6	7	8	9
Bertrand profit	39	54	69	81	90	99	90	72	51

OSS model: experiment – integration

Timing:

1. Choose price individually from $p \in [1, 2, \ldots, 9]$
2. Determine market price $p_M = min\{p^{NI}, p^I\}$
3. Calculate profit:
    - The nonintegrated firm (NI) as before.
    - The profit integrated firm (I):

$$\pi^I = \begin{cases} \text{Bertrand profit}(p_M) + \text{Additional profit}(p_M) & \text{if } p^I = p_M < p^{NI} \\ \frac{1}{2} \times \text{Bertrand profit}(p_M) + \text{Additional profit}(p_M) & \text{if } p^I = p_M = p^{NI} \\ \text{Additional profit}(p_M) & \text{if } p^I > p_M \end{cases}$$

THE PAYOFF TABLE FOR THE TREATMENTS WITH VERTICAL INTEGRATION

Price	1	2	3	4	5	6	7	8	9
Bertrand profit (both firms)	39	54	69	81	90	99	90	72	51
Additional profit (integrated firms only)	66	74	84	96	105	132	159	180	198

Foreclosure: GE-Honeywell merger

Pepall et al. (2010, pp. 446-447)

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. (2014, pp. 453-455)

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

Main results:

Table 16.2 Results for regressions explaining ready-mixed concrete prices in the US

Independent Variable	*Dependent Variable: Weighted Average Market Price (log)*	*Dependent Variable: Weighted Average Market Price (log)*	*Dependent Variable: Weighted Average Market Price (log)*
Market Share of Vertically Integrated firms	−0.090* (0.041)	−0.086* (0.041)	−0.043 (0.039)
Market Share of Multiple Plant Firms	——	−0.015 (0.022)	0.001 (0.024)
Weighted Average Total Factor Productivity	——	——	−0.293* (0.054)
R^2	0.433	0.434	0.573

*Significant at five percent level.

How do you interpret this?