

Double marginalization and vertical integration

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Antitrust standards in European and US guidelines

Merger specificity of EDM

- EU V/HMG: *Efficiencies are relevant to the competitive assessment when they are a direct consequence of the merger*
- US VMG: *Do not reject merger specificity solely because it could theoretically be achieved but for the merger*

Passing-on to consumers

- EU V/HMG: Relevant benchmark in assessing efficiency claims: **consumers** will not be worse off as a result of merger
- US VMG
 - only concerned about “*the likely cost saving to the merged firm*”
 - never mention the benefits to direct (and/or final) customers

What we do

Develop a framework where

- DM is *optimal* under sophisticated contracts
- EDM is merger-specific
- Effect of merger on consumers depends on the interaction of foreclosure and EDM
- Foreclosure of *efficient* independent suppliers can harm or benefit consumers

Main research question

Under what circumstances do foreclosure effects harm consumers?

Ingredients

Asymmetric information

- Buyer does not know the suppliers' costs
- Extension: Buyer's private information

Bargaining under Asymmetric information

Loertscher and Marx's framework

Buyer power (BP)

- Ability to choose trading partners [Selection]
- Ability to influence trading terms (price/quantity) [Production]

Preview of results

DM governed by bargaining over quantity/price

- Monopsony power to reduce quantity and informational rents
- Nonlinear pricing *can* eliminate DM but often *does not* in equilibrium

Vertical integration (VI) \Rightarrow “Customer foreclosure”

- **Efficient** independent suppliers deprived of access to final consumers
- With full buyer power for production, consumers always benefit from VI.
- But this Chicago-like result fails to hold as soon as the buyer has less bargaining power over production than selection (at least vis-à-vis one supplier).

Firms and consumers

Buyer B dominant on downstream market

- Monopoly or competitive fringe (that uses another input)
- Revenue $R(q) = P(q)q - C(q)$
- Consumer surplus $S(q) = \int_0^q [P(x) - P(q)] dx$
- Monopoly quantity $q^m(c) = \arg \max_q R(q) - cq$
- Uses input in fixed-proportion (one to one) to produce output

Upstream suppliers S_0, \dots, S_n

- Cost with c_0, c_1, \dots, c_n distributed according to F_i

Procurement process

Allowing for simultaneous or sequential process

Sequential timing

1. Monotonic selection of supplier(s) (Milgrom and Segal, 2020)

- Supplier i is selected, $x_i(c_0, \dots, c_n) = 1$

$$c_i < c'_i \implies x_i(c_i; c_{-i}) \geq x_i(c'_i; c_{-i})$$

- Selection reveals minimum information on selected supplier (UWP)

2. Production stage: Determination of prices and quantities

Bargaining over prices and quantities

General mechanism ($Q_i(\mathbf{c}), M_i(\mathbf{c})$)

- that maximizes weighted industry profit

$$\mu^B \Pi_B(\mathbf{c}) + \sum_i \mu_i^S U_i(\mathbf{c}) = \mu^B \left[\Pi_B(\mathbf{c}) + \sum_i \underbrace{\frac{\mu_i^S}{\mu^B}}_{\equiv \mu_i} U_i(\mathbf{c}) \right]$$

- As in Loertscher and Marx (2019), here with a single buyer
- No contractual restriction

Bargaining weights for prices and quantities

- $\mu_i = 0$: **Full buyer power for production**
- As μ_i rises, B finds it more difficult to reduce Q_i

Selection rule maximizes $\Pi_B(\mathbf{c}) + \sum \lambda_i U_i(\mathbf{c})$

Parameters λ_i and μ_i reflect bargaining conditions

- $\mu_i = \lambda_i$: no change in environment, simultaneous game
- $\mu_i \geq \lambda_i$: **for large and complex project, contractor obtains leverage upon being awarded the contract**
- $\mu_i \leq \lambda_i$: difficult to avoid S_i at the selection stage

Monopsonistic buyer has more BP than all suppliers

- Baseline model : $\lambda_i < 1$ and $\mu_i < 1$ for any i .
- Extension with bilateral asymmetric information

VERTICAL SEPARATION

Bargaining over price/quantity with selected suppliers

- Contract granted to supplier i with lowest weighted virtual cost

$$\Psi_i(c_i; \mu_i) = c_i + (1 - \mu_i)F_i(c_i)/f_i(c_i)$$

- Bilaterally inefficient traded quantity, $q^m(\Psi_i(c_i; \mu_i)) < q^m(c_i)$
- Exercise of monopsony power \Rightarrow **Double Marginalization**
- Degree of DM decreases with supplier's weight μ_i

Supplier selection

After selection B learns selected suppliers' costs below thresholds

Selecting the supplier with the highest virtual profit

$$\pi_j^V = R(q^m(\Psi_j(c_j; \mu_j))) - \Psi_j(c_j; \lambda_j)q^m(\Psi_j(c_j; \mu_j))$$

- If $\lambda_j = \mu_j$ **for all** i , at given cost, decision biased in favor of most powerful supplier
- If $\lambda_j = 0$ **for all** i , decision biased against powerful suppliers

Implementation

Deferred acceptance auction and two-part tariffs

- Descending auction where suppliers are offered a less and less rich menu of two-part tariffs
- They can exit at any time
- The winner is the last active bidder
- He picks a tariff in the final menu
- Buyer chooses quantity given selected tariff

In equilibrium, a two-part tariff is observed

Wholesale price

$$w(c_i) = \Psi_i(c_i; \mu_i) > c_i$$

... and there is double marginalization

VERTICAL INTEGRATION

Assumption: Merger between B and S_0 causes μ_0 to rise

$$\Pi^{\text{VI}} = \Pi_B(\mathbf{c}) + \mu'_0 U_0(\mathbf{c}) + \sum_{i \geq 1} \mu_i U_i(\mathbf{c})$$

- $\mu'_0 = 1$ makes it costless to extract information about c_0
- Imperfect internalization of profits within the integrated firm (Crawford et al. 2018): $\mu_0 < \mu'_0 = 1$

Vertical integration

Main effects of merger with S_0

- **DM is eliminated** (or reduced) whenever B purchases from S_0 pre-merger
- **Exploitation.** Conditional upon producing, an independent supplier sells the same quantity as pre-merger but earns a lower profit
- **Customer foreclosure.** After S_0 is vertically integrated, the independent suppliers are less likely to have access to downstream market

Effect of foreclosure on consumers

Post-merger make-or-buy rule aligned with consumers' interests if and only if $\lambda_i \geq \mu_i$ for all $i > 0$

- True under one-stage bargaining: selection based on virtual costs, which drive quantities.
- Otherwise, $\Pi(q^m(\Psi_i(c_i; \mu_i^S)); \Psi_i(c_i; \lambda_i^S)) < \Pi^m(\Psi_i(c_i; \mu_i))$ implies too much foreclosure from the consumers' perspective

Example: Buyer fully controls selection, $\lambda_j = 0$ for all suppliers

Symmetric environment

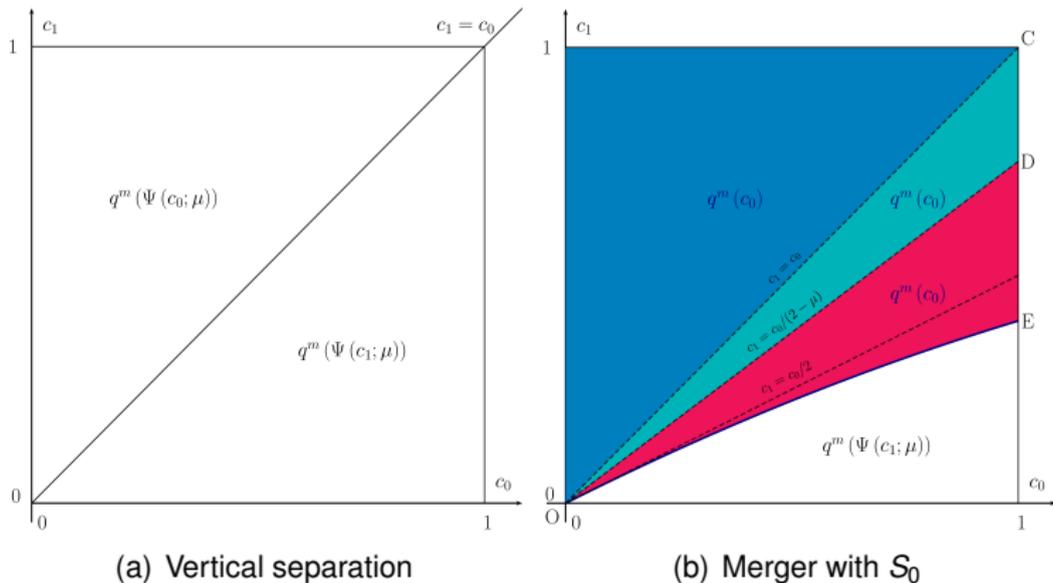


Figure 1: Effect of merger with S_0 on consumer surplus ($F_0 = F_1$, $\mu_0 = \mu_1$)

Profit-maximizing selection

Symmetric environment

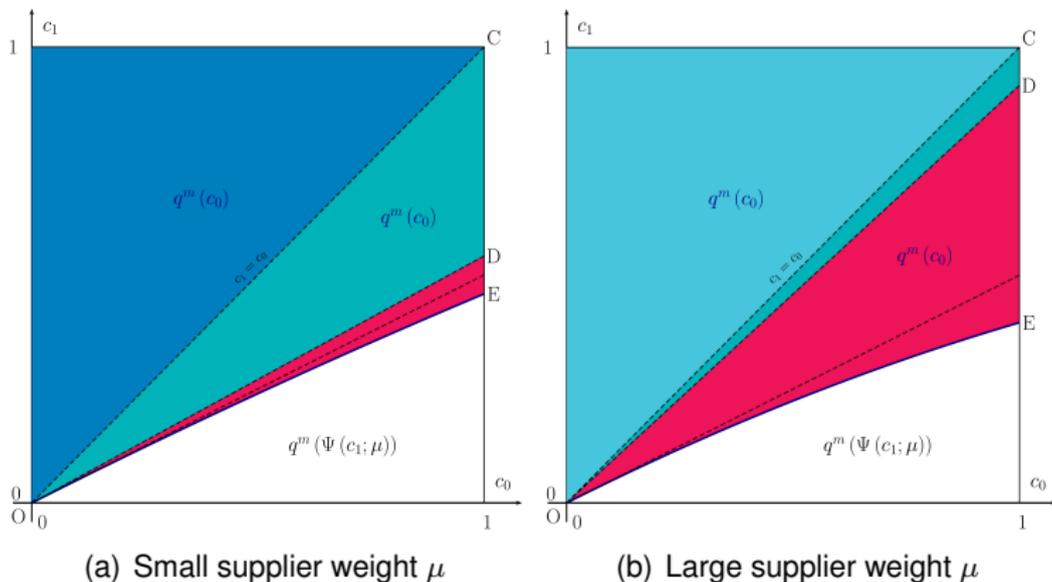


Figure 2: Expected consumer harm increases with μ

Conclusion

Exclusion of efficient suppliers never harms consumers if and only the buyer does not lose BP vis-à-vis any supplier after selection.

Antitrust enforcers should document

- How quantities are determined and **how suppliers are selected**
- Buyer's ability to exclude suppliers and to impose quantity/price

Convex costs and multi-sourcing

Two symmetric suppliers with cost functions $c_i q_i + \alpha q_i^2$

If same BP for selection and production

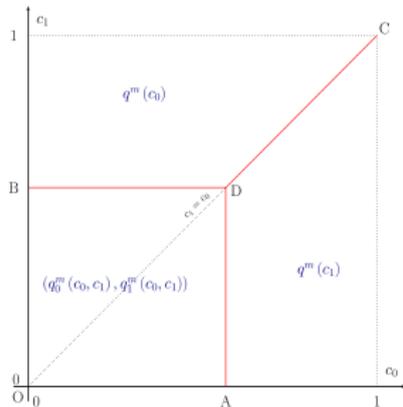
- Both suppliers always selected pre- and post-merger
- VI always benefits consumers

If buyer controls only selection

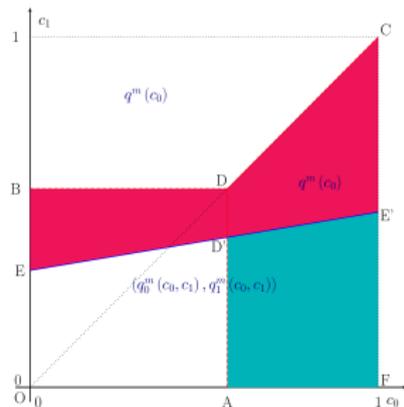
- Separation: To minimize rents, B doesn't select S_j with large c_j
- Vertical integration:
 - Foreclosure of efficient competitors harms consumers
 - New effect: VI corrects inefficient exclusion of S_0 pre-merger

Convex costs and multi-sourcing

Buyer controls only selection. Two symmetric suppliers with cost $c_i q_i + q_i^2$, $\lambda = 0$, $\mu = 1$



(a) Vertical separation



(b) Merger with S_0

Figure 3: Multisourcing in $OADB$ pre-merger and below EE' post-merger

Bilateral information

Buyer has private information about cost or demand

If buyer is dominant (as we assumed so far)

B 's private info plays no role

If a supplier is dominant ($\max \mu_i^S > \mu_B = 1$)

With same BP for selection and production, merger with that supplier

- benefits consumers
- eliminates DM due to B 's private information

Choice of merging partner

Under one-stage bargaining

Buyer prefers to integrate with less powerful supplier, keeping powerful supplier as an independent competitor

Under two-stage bargaining

Preferred choice of merging partner is ambiguous