

Horizontal Foreclosure

Özlem Bedre-Defolie

European School of Management and Technology

June 26, 2017

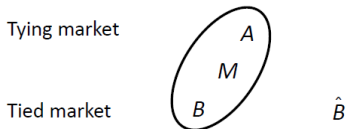
Practices

- Tying: When two or more goods are tied, the buyer of the main product (tying good) must buy one or more complementary goods (tied goods) exclusively from the same supplier.
 - Typically, the tying good is a durable good (e.g., a copier) while the tied goods are non-durables like toner, paper, or service.
- Pure bundling: A commercial pack that consists of at least two distinct products/services (e.g., one dominant product and one competitive product). No way to buy separately.
- Mixed bundling: You have also the option to buy products separately. (The firm offers a discount on one good if the consumer buys also the other good).
- Anti-trust scrutiny of those practices if they are applied by a dominant firm (Article 102 in Europe).

Rationales other than anti-competitive ones

- Distribution cost savings, examples: bicycles, meals.
- Compatibility cost savings, examples: airplane, car
- IP protection, example: Coca-Cola compatible biscuits
- Legitimate price response (tie-in as a zero price: penetration pricing, 2sms., ...)
- Price discrimination (IBM punched cards; Armstrong, 1999; Bakos-Brynjolfson Management Science, 1999)

Chicago School Argument



- Firm M sells two goods, A and B , and faces competition only in the second market where many firms sell good \hat{B} .
- Goods are complements (critical assumption)
- Idea: The monopolist of A could capture the consumer surplus which results from an increased competition in market B .

Chicago School Argument- Ctd

Assumptions:

- B is useless unless combined with A
- Consumers want 1 unit of each good.
- Surplus A from good A , additional surplus B or \hat{B} from good B :
 $\hat{B} \geq B$
- Unit production costs $a, b, \hat{b} : \hat{b} \leq b$
- Technological advantage of the non-integrated producers:
 $\Delta = \hat{B} - B + b - \hat{b}$
- Non-integrated producers are competitive.

Chicago School Argument- Ctd

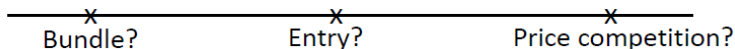
- Bundling: $\pi_M^B = A + B - (a + b)$
- Unbundling: M charges for A : $A + \hat{B} - \hat{b}$
- $\pi_M^{UB} = A + \hat{B} - \hat{b} - a = \pi_M^B + \Delta$
- Idea: If competition in B leads better value for products, it will be allowed by the monopolist of A .
- Missing points: Efficiency gains from bundling, imperfectly competitive market \hat{B} .

Critiques to Chicago Argument

(1) Bundling as a commitment device to be fierce competitor in case of entry (Whinston, 1990, AER):

Suppose

- A and B are independent
- (only potential entrant) \hat{B} has not yet entered; fixed cost of entry $f \leq \Delta$
- Before the entry decision, M decides whether to sell the two goods as a bundle. Bundling cannot be undone (full commitment)



- Idea: By bundling A and B , the monopolist can commit to be a fiercer competitor if the entry occurs, since then lowering price of B would also lead to more sales of A which in turn lowers the opportunity cost of undercutting the entrant.

✓ Unbundling

- M earns margin $m_A = A - a$ on A -segment ($CS_A = 0$)
- E takes B market by charging \hat{p} : $\hat{B} - \hat{p} = B - b(-\epsilon)$, so $\hat{p} = \hat{B} - B + b$.
- E 's profit is $\Pi_E = \hat{p} - \hat{b} - f = \Delta - f$.
- Consumers' surplus from B -segment is $CS_B = B - b$.

✓ Bundling

- If consumers buy M 's bundle at price P , they get

$$CS_M = A + B - P = B - (P - A)$$

- As if M sells B at effective price $P - A$
- Bundling lowers M 's opportunity cost of selling B :

$$b' = b - m_A \} \text{ (lower marginal costs in market } B \text{ makes } M \text{ more aggressive)}$$

- So M would be willing to lower P down to $a + b$:
 $\max(CS_M) = A + B - (a + b) = B - (b - m_A)$

- Case #1: $\Delta < m_A$ M wins since consumers prefer buying the bundle at $P = a + b$ than E 's product at \hat{b} :

$$A + B - (a + b) > \hat{B} - \hat{b}$$

- Case #2: $\Delta > m_A > \Delta - f$ E wins if enters, but entry is not profitable since E 's maximum margin which enables it to win the competition will be lower than the entry fee:

$$\begin{aligned} \hat{B} - (\hat{b} + m_E) &\geq A + B - (a + b) \\ m_E &\leq \Delta - m_A < f \end{aligned}$$

- In both cases bundling blocks entry and M charges $P = A + B$ for the bundle and earns $B - b$ from B -segment.

Critical Assumption: Commitment

- M would like to unbundle ex-post (bundling reduces profits even if M wins).
- Given that entry has occurred, without bundling M gets m_A
- Given that entry has occurred, with bundling M can charge maximum $P = A + b - \Delta$ and so earn maximum $m_A - \Delta$.

Critiques to Chicago Argument

(2) Bundling intensifies competition, Matutes-Regibeau, JIE, 1998, 2002:

- Two firms, A,B, produce two components, 1,2, of a system.
- Marginal costs are constant.
- Consumers are uniformly distributed on a unit square where firm A is located at the origin and firm B is located at (1, 1).
- Timing
 1. The firms simultaneously decide whether to make their components compatible with its rival's. Compatibility prevails if both firms agree to it by adopting a common standard
 2. The firms decide whether to sell their components separately or as a bundle or offer both.
 3. The firms compete in prices

(2) Bundling intensifies competition, Matutes-Regibeau- Ctd:

There are two effects

- When the market is not covered, separate selling increases variety and so shifts the market demand upward.
- Bundling intensifies competition: Each firm then fully internalizes the complementarity between the components.
- Result 1: When the market is not covered, the firms are local monopolies and the former effect dominates the latter, so the firms prefer separate selling to bundling. In prisoner's dilemma equilibrium, both firms choose mixed bundling.

Intuition: Given that a rival chooses separate selling, the firm benefits from mixed bundling since this enables it to internalize the complementarity effects for its pure system and charge a higher price for the hybrid systems (free-riding on the rival's effort to expand the market demand).

- Result 2: When the market is covered, the firms compete directly and so choose separate selling to avoid fierce competition and at the same time to increase variety.

Critiques to Chicago Argument

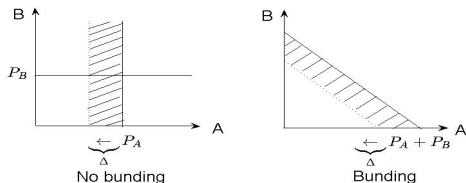
(2) Bundling intensifies competition, Nalebuff, 2000:

- One integrated firm sells components (perfect complements) and each mono-product firm sells one component competing against the integrated firm:

A B C D integrated firm, M

\hat{A} \hat{B} \hat{C} \hat{D} independent mono-product firms

- Idea: with bundling a change of price affects both products

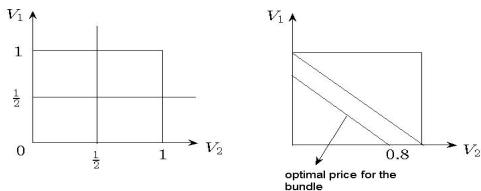


(2) Bundling intensifies competition, Nalebuff, 2000- Ctd:

- Despite the fact that bundling intensifies competition, it may increase M 's profit through an increase in its market share.
- Unintegrated firms face multiple marginalization problem
- Integrated firm internalises the complementarity between components partly.
- Under unbundling, all firms benefit from this: a price cut on A benefits also producers of \hat{B} , \hat{C} , \hat{D} .
- With bundling only the integrated firm benefits from this internalisation, while mono-product firms still fail to internalise complementarities.
- As the number of components increase, bundling might be profitable; the gains in market share offset the losses from intense competition.

Bundling and Monopoly

→ Bundling lowers the prices, so the monopoly would prefer not to bundle.



⇒ Bundling can be used as a commitment to lower price.

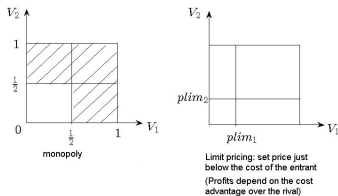
Critiques to Chicago Argument

(3) Protecting the monopoly power, Nalebuff, QJE, 2004:

- One monopoly sells two goods for which consumers have independent valuations.
- Consumers are uniformly distributed over the unit square.
- There might be potential entry by a perfect substitute to either of the two markets.
- Timing:
 1. The incumbent decides whether to sell the two goods separately or in a bundle. And sets its price(s).
 2. The potential entrant decides whether to enter in either of the two markets.

Nalebuff, 2004- Ctd

No Bundling:



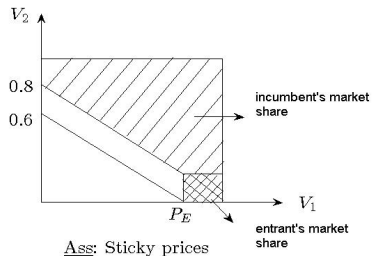
- If the incumbent allows entry, it earns $1/4$, since it loses one market to the entrant.
- If the incumbent deters entry with limit pricing, it earns $2E$, where E is the fixed cost of entry.
- Conclusion: Deter entry if $E > 1/8$.

Nalebuff, 2004- Ctd

Bundling

- Absent entry, the incumbent would set the bundle price < 1 since the marginal consumer's valuation is higher with bundling.
- Facing potential entry, suppose that the incumbent sells its bundle at 1 and that the entrant has product B. If the entrant sells B at 0.5, it can only sell people who value B above 0.5 and value A below 0.5.

Nalebuff, 2004- Ctd



- Bundling makes entry more difficult.
- There is less loss in reducing the price.
- If entry occurs, bundling causes differentiation, so less competition.

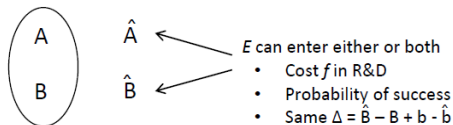
Nalebuff, 2004- Ctd

Idea: Bundling reduces the market share of the entrant if entry occurs.

- Without bundling, if the entrant offers a ϵ lower price than the incumbent, it gains the entire market.
- However, with bundling, if the entrant offers a ϵ lower price than the incumbent, it steals less than the entire market.
- Lowering P^{bundle} below 0,8 has a second order effect loss to the incumbent and a first order loss to the entrant.

Critiques to Chicago Argument

(4) Risky Entry (Choi-Stefanadis, RJE, 2001)



Assumptions:

- Incumbent commits bundling.
- Goods are useful only if combined together (perfect complements), A is useless without B and vice versa.
- The success of R&D projects in the two markets are stochastically independent.

Choi-Stefanadis, 2001- Ctd

Timing:

1. M decides whether to bundle the two goods.
2. In each market, E decides whether to invest in R&D.
3. M and E (in case of successful entry) set their prices (Bertrand Comp)

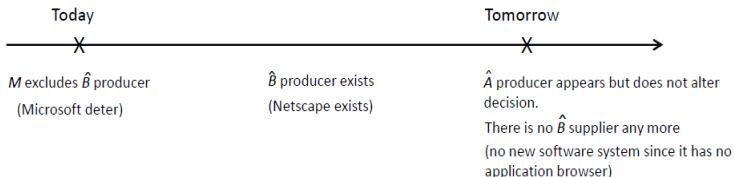
Choi-Stefanadis, 2001- Ctd

- Unbundling: E enters both markets as long as $f < p\Delta$.
- Bundling: The entrant can make profits only if it succeeds in both markets.
 - E enters if and only if $2f < 2p^2\Delta \Leftrightarrow f < p^2\Delta$
 - If R&D investments were perfectly correlated, E would enter iff $f < p\Delta$ (with or without bundling).
 - If there is no perfect correlation, entry is less likely with bundling.
- Conclusion: If E could capture its technological advantage fully, tying deters entry in both markets whenever

$$p^2 < \frac{f}{\Delta} < p$$

- Otherwise, tying deters entry less often.
- Compared to the Chicago argument: Here the entry can occur in both segments, initially M is the monopolist in both segments and there is uncertainty in R&D investment success.

Chicago School Predation Story

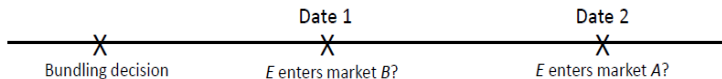


✓ M loses money today and recoups it tomorrow.

Microsoft (1998) preferred to bundle Windows with its browser, to deter entry of Netscape to the browser market so to deter future entry to the monopolized segment.

Critiques to Chicago Argument

(5) Economies of scale and scope (Carlton and Waldman, 2002):



- Entry is not risky ($p=1$)
- Entrant not yet ready to enter market A at date 1 (in that sense, A is “core market”)
- Suppose no discounting
- A and B are complements
- In the absence of tying, E can capture its technological advantage in that market, Δ_i .

Carlton and Waldman, 2002- Ctd

Assume:

- If E is in market B , it is worth entering to market A

$$f_A < \Delta_A \quad (1)$$

(since otherwise there will be no entry at all \rightarrow not interesting)

- E makes money in market B if only it enters at date 1

$$\Delta_B < f_B < 2\Delta_B \quad (2)$$

- E makes money in market A only if it is already active at date 1.

$$\Delta_A + \Delta_B < f_A + f_B < \Delta_A + 2\Delta_B \quad (3)$$

Carlton and Waldman, 2002- Ctd

- Unbundling: From (1) and (2), entry in market B at date 1 and in market A at date 2.
- Bundling: From (3), bundling deters entry (deprives E from returns to scale on investment in market B)
- Loss in period 1 (Chicago School argument) is recouped in period 2.

Summary

- When the goods are perfect complements and the entry is costless, bundling A and B would deter entry, but it is not profitable for the incumbent, since by allowing entry the incumbent can raise the price of A to capture the competitive advantage of the potential entrant (Chicago School Argument)
- When the goods are independent and the entry is costly, bundling A and B might deter entry and it might be profitable for the incumbent if the competitive advantage of the potential entrant is not very high (relies on the assumption of commitment to bundle)
- When the entry is costly, the challenger might enter either of the markets and offers a perfect substitute, bundling makes entry more difficult since bundling lowers the expected market share of the potential entrant if it enters. Bundling is profitable for the incumbent even when the entry occurs (it differentiates the products).

Summary

- Bundling intensifies competition, but might be profitable for an integrated firm of components since it enables the firm to benefit from internalising complementarities.
- Bundling might deter entry of a more efficient firm if the entrant has to do risky R&D investments to enter a market.
- Bundling might deter entry of a more efficient firm if there are economies of scope (entering one segment today is necessary to make entry to the other segment profitable tomorrow.)