Competitive Strategy: Week 10

Vertical Relations

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Introduction

- Selling to other firms is different from mass consumer markets
  1. Large customers have bargaining power.
  2. Customers compete with each other.
- We suppose the value chain consists of three levels:
  - Upstream firms
  - Downstream firms
  - Final customers

Double Marginalisation

- Model
  - Upstream firm, U. Cost 0, charges p^U per unit.
  - Downstream firm, D. Cost p^U, charges p^D.
  - Customers demand $q(p) = a - p^D$.
- Profit of downstream firm is

$$\pi^D = (p^D - p^U)(a - p^D)$$

  - Differentiating, optimal price is $p^D = (a + p^U)/2$.
  - Optimal quantity is $q^D = (a - p^U)/2$.
- Hence U faces demand curve $q = (a - p^U)/2$. U's profit,

$$\pi^U = p^U(a - p^U)/2$$

  - Differentiating, at optimum, $p^U = a/2$ and $q^U = a/4$.

Double Marginalisation cont.

- Summary
  - Prices: $p^U = a/2$ and $p^D = 3a/4$.
  - Quantity sold: $q^U = q^D = a/4$.
- What if U and D vertically integrated?
  - Charge price p^I. Joint profit,

$$\pi = p^I(a - p^I)$$

  - Differentiating, at optimum, $p^I = a/2$ and $q^I = a/2$.
- Double marginalisation problem:
  - When one firm raises price, they exert negative externality on other firm.
  - Profit less under vertical separation than vertical integration.

Case Study: Porsche

- In 1984 Porsches sold through VW-Audi dealership
  - Dealers pay low price for car: less than "invoice"
  - 90% sales sold close to suggested retail price.
  - Dealers hold inventory and contribute to national advertising.
  - Setup due to Alfred Sloan: dealerships build loyalty.
- Porsche's suggested scheme:
  - Dealers book orders. Get 8% commission.
  - PorscheUSA sets prices and holds inventory.
- Huge resistance from dealers (who made 18% margins before).
  - Dealers and VW filed legal suits using franchise laws.
  - Porsche backed down although defended legal position.

Double Marginalisation: Two–Part Tariff

- Suppose U uses two–part tariff

$$p^U = F + x^U q$$

- Firms can produce same quantity as when integrated.
  - Set x^U equal to U's MC (zero in this case). D's profits:

$$\begin{aligned} \pi^D &= (p^D - x^U)(a - p^D) - F \\ &= p^D(a - p^D) - F \end{aligned}$$

  Hence D chooses $p^D = p^I$ and $q^D = q^I$.
- How choose F?
  - $F = 0$ then D gets all profit. $F = \pi^I$ then U gets all profit.
  - Depends on bargaining power.
- Analogy: First degree price discrimination.

Double Marginalisation: RPM

- Maximum resale price
  - U names maximum price, p^M, that D can charge
- Firms can produce same quantity as when integrated.
  - U sets $p^M = a/2$, so D sells $a/2$.
  - U sets p^U equal to p^M minus D's MC (zero in this case).
- Idea: U chooses upstream and downstream price.
  - Internalise externality.
  - Just make sure D gets positive profits.
- So there are contractual solutions to double marginalisation
  - But many supply chains still suffer.
  - For example, we assumed U knows D's costs.

Two–part Tariffs with Downstream Competition

- Model
  - One upstream firm U with cost 0.
  - Two downstream firms D_1 and D_2 have cost 0.
  - Two–part tariff: U sells q_i to D_i for fee t_i.
  - D_1 and D_2 Cournot competitors. Demand $p(q) = 1 - q$.
- Contracts publicly observable.
  - U chooses (q_1, t_1, q_2, t_2) to maximise

$$\pi_U = t_1 + t_2 \quad \text{s.t.} \quad (1 - q_1 - q_2)q_i - t_i \geq 0 \quad i \in \{1, 2\}$$

  - Thus U chooses (q_1, q_2) to maximise

$$(1 - q_1 - q_2)q_1 + (1 - q_1 - q_2)q_2$$

  - Solution: $q_1^* + q_2^* = 1/2$ That is, U provides monopoly qty.

Two–part Tariffs with Downstream Competition

- Contracts privately observable.
  - Problem: U has incentive to supply too much to downstream firms. Problem of secret price cuts.
  - D_1 anticipates U has contract $(\hat{q}_2, \hat{t}_2)$ with D_2.
- U chooses (q_1, t_1, q_2, t_2) to maximise

$$\pi_U = t_1 + t_2 \quad \text{s.t.} \quad (1 - q_1 - \hat{q}_2)q_1 - t_1 \geq 0 \quad \text{and} \quad (1 - \hat{q}_1 - q_2)q_2 - t_2 \geq 0$$

- Substituting, U chooses (q_1, q_2) to maximise

$$(1 - q_1 - \hat{q}_2)q_1 + (1 - \hat{q}_1 - q_2)q_2$$

- Solution: $q_1^* = (1 - \hat{q}_2)/2$ and $q_2^* = (1 - \hat{q}_1)/2$.
  - In equilibrium expectations correct: $\hat{q}_1 = q_1^*$ and $\hat{q}_2 = q_2^*$.
  - Hence $q_1^* = q_2^* = 1/3$. That is, U provides Cournot qty.

Investment Externalities

- Suppose two downstream firms D_1 and D_2.
- D_1 can invest in product to increase consumers' values.
  - Advertising
  - Free samples
  - Expertise
- Problem: D_2 free–rides on investments and undercuts D_1.
- Solutions
  - Resale price maintenance (minimum resale price), e.g. Books in UK. But RPM is illegal in the US.
  - Exclusive territories, e.g. Cars.
  - U pays D for investment, e.g. supermarket shelves.

Assignment

- Read “Face Value: The Man with Two Daggers”, The Economist, August 27th, 2005.
- What is the upstream business of BenQ?
- What is BenQ’s big strategy?
- How did Motorola react to this move?
- How is the strategy working out so far?
- What do you think will happen over the next ten years?