Competitive Strategy: Week 8

Entry

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Entry Barriers

- Joe Bain's definition of entry barrier
  - Anything that allows incumbant firms to earn supranormal profits without threat of entry.
- Bain suggested some barriers:
  - Economies of scale (e.g. fixed costs).
  - Absolute cost advantages.
  - Product differentiation.
  - Capital requirements.

Entry and Cournot Competition

- Costs $c(q) = F$. Demand $Q(P) = 1 - P$.
- In Cournot equilibrium with n firms, profit is

$$\Pi(n) = \left(\frac{1}{n+1}\right)^2 - F$$

- Assuming $n-1$ firms in market, new firm enters if $\Pi(n) \geq 0$.
  - Entry is harder when F is high.
- Equilibrium number of firms

$$n^* = \frac{1}{\sqrt{F}} - 1$$

Entry and Bertrand Competition

- Costs $c(q) = F$. Demand $Q(P) = 1 - P$.
- If $n = 1$, firm makes monopoly profit:

$$\Pi(1) = \frac{1}{4} - F$$

- If $n \geq 2$, Betrand competition implies

$$\Pi(n) = -F$$

- Incumbent will never face entry: Entrant has no added value.
- Heisenberg principle: You change game by joining.
- History matters: first mover advantage.
- Logic: backwards induction.
  - Desirability of entry depends on what happens after entry.

NutraSweet

- NutraSweet made over $500m in 1985.
  - Patent ended in 1987 in Europe and 1992 in USA.
- In 1986, Holland Sweetener Co. built plant in Holland.
  - In 1987, prices fell from $70/lb to $25/lb.
  - Holland made large losses.
- In the US, Pepsi and Coke signed new deals in 1991.
  - But at much lower prices. Saved $200m a year.
- Pepsi and Coke gained most from Holland's entry; not Holland.

Gainesville Regional Utility

- City–owned utility depended on CSX railroad for coal.
  - Price $20.13/ton
- Norfolk Southern offered Gainesville $13.68/ton.
  - But NS railroad 20 miles too short. Cost $28m to extend.
- CSX eventually offered $15.38/ton
  - Also threatened to abandon railroad, so town would be hostage to NS.
- Gainseville signed new contract with CSX. Saved $34m.

How Incumbents Respond to Threat

- Blockaded Entry
  - Incumbents compete as if no entry threat.
- Deterred Entry
  - Incumbents modify behaviour to deter entry.
- Accommodated Entry
  - Incumbents find it (individually) more profitable to allow entry than deter.

How can an Incumbent Deter Entry?

- Limit entry pricing: incumbent could lower its price
  - But is this credible?
  - Why does price *before* entry have anything to do with price *after* entry?
  - Game theory killed limit entry pricing in 1970s.
- For this reason we analyse case where incumbent can deter entry through quantity or capacity choice.
- Limit entry pricing resuscitate in 1980s
  - Signaling: low pre–entry price signals low cost.
  - Switching costs.
- There are other ways to deter entry. For example, signing long term contracts with customers.

Blockading, Accommodating and Deterring

- Incumbent firm 1 chooses quantity.
  - Firm 2 chooses to enter or not.
  - In firm 2 enters they then chooses quantity.
- Costs $c(q) = F$. Demand $Q(P) = 1 - P$.
- Firm 2 chooses quantity $q_2 = (1 - q_1)/2$. Profit becomes,

$$\Pi_2 = \frac{1}{4}(1 - q_1)^2 - F$$

- Blockade firm 2.
  - Firm 1 ignores firm 2 and maximises $\Pi_1 = q_1(1 - q_1)$, yielding $q_1^* = 1/2$.
  - If firm 2 enters they make $q_2^* = 1/4$ and $\Pi_2 = 1/16 - F$.
  - Blockade if $F \geq 1/16$.

Blockading, Accommodating and Deterring cont.

- Accommodate firm 2. (Classic Stackelberg)
  - Firm 1 assumes firm 2 will enter. Firm 1 maximises

$$\Pi_1 = q_1(1 - q_1 - \frac{1 - q_1}{2})$$

  - Hence $q_1^* = 1/2$, $q_2^* = 1/4$, $\Pi_1 = 1/8$ and $\Pi_2 = 1/16 - F$.
- Deter firm 2.
  - Firm 1 chooses $q_1 = 1 - 2\sqrt{F}$, so $\Pi_2 = 0$.
  - Profit: $\Pi_1 = 2\sqrt{F} - 2F$.
  - At $F^* \approx 1/200$, $2\sqrt{F^*} - 3F^* = 1/8 - F^*$
- Summary
  - If $F \geq 1/16$ then blockade.
  - If $1/16 > F \geq F^*$ then deter.
  - If $F^* > F$ then accommodate.

Capacity Investment to Deter Entry

- If firm can commit to high quantity it can delay entry.
  - Is this credible?
  - After entry won't want to produce $q_1 = 1 - 2\sqrt{F}$.
- Reinterpret the Stackelberg model
  - Firm 1 chooses capacity
  - Firm 2 choose to enter and her capacity
  - Firms choose output
- Firm 1 can invest in a lot of capacity to make high output strategy credible.

A Taxonomy of Business Strategies

- Firm 1 is incumbent. Firm 2 is entrant.
  1. Firm 1 chooses investment K_1.
  2. Firms 1 and 2 simultaneously choose x_1 and x_2 (e.g. outputs).
- Profit of firm i is $\Pi^i(K_1, x_1, x_2)$.

Blockading Entry

- Firm 2 does not enter.
- Firm 1 chooses monopoly level of output, $x_1^m(K_1)$, where

$$\frac{\partial}{\partial x_1}\Pi^1(K_1, x_1^m, 0) = 0$$

- Firm 1 chooses monopoly investment, K_1^m, where

$$\frac{d}{dK_1}\Pi^1(K_1, x_1^m(K_1), 0) = 0$$

Deterring Entry

- If entry occurs then choose Nash output $(x_1^*(K_1), x_2^*(K_1))$
- To deter entry choose K_1 such that

$$\Pi^2(K_1, x_1^*(K_1), x_2^*(K_1)) = 0$$

- How does K_1 effect Π_2? Differentiating,

$$\frac{d\Pi^2}{dK_1} = \frac{\partial \Pi^2}{\partial K_1} + \frac{\partial \Pi^2}{\partial x_1}\frac{\partial x_1^*}{\partial K_1}$$

  where $\partial\Pi^2/\partial x_2 = 0$.
- 1st term: Direct effect. 2nd term: Strategic effect.
- Firm 1 wants to look tough to deter.
  - Investment makes you look tough if $d\Pi^2/dK_1 < 0$
  - Investment makes you look soft if $d\Pi^2/dK_1 > 0$

Ways to Look Tough

- Investment in production capacity
- Product positioning
  - Moving towards center of Hotelling line.
- Product proliferation
  - Having many products on the market.
- Tying
  - Firm 1 is in markets A and B. Firm 2 enters market A.
  - If products are tied then entry will be more costly for firm 1.
  - Hence commit to react aggressively to entry.

Entrant's Strategy: Get paid to Play

- Recall NutraSweet and Gainseville examples.
  - Entry benefits customers more than entrant.
  - Entrant should ask customer to pay for entry.
- How to get paid
  - Sign contract before entering.
  - Contributions towards fixed costs.
  - Last–look provision.
- Example: Cell–Phones.
  - In 1989, McCaw bid for LIN Broadcasting.
  - LIN paid \$94m to get BellSouth to bid.
  - McCaw increased bid and paid BellSouth \$23m to exit.
  - McCaw eventually won, but paid \$1,000m more.

Entrant's Strategy: Judo Entry

- Example: Sega vs. Nintendo.
  - Nintendo dominated 8-bit market.
  - Sega entered with 16-bit machine.
  - Nintendo delayed 16-bit, for fear of cannibalizing 8-bit sales.
- Example: Softsoap
  - When Softsoap launched, not clear whether it would be success.
  - Hence majors didn't launch with brand names.
- Example: Entering small.
  - Not worth crushing: lowering price too costly.
- Judo entry: Use incumbent's weakness as your strength.

Encouraging Entry of Compliments

- We have more rivals that we would like.
- We have fewer complimentors than we would like
  - Fiat failed in US due to mechanic shortage.
- Subsidise compliments
  - MS subsidised 3rd party software for DOS
- Form jointly funded compliment provider
  - Industry association
- Do it yourself!
  - Sony bought Columbia pictures/music after Betamax

Assignment

- Read "EasyOz" (27/10/05), "Battle of the Atlantic" (13/10/05) and "Crowded Skies" (22/04/04) in The Economist. For background: "What is Strategy?", Michael Porter, Harvard Business Review 1996.
- Which types of firm are entering the long haul airline industry?
- What is the strategy of the entrants? What is their competitive advantage?
- What are the entry costs?
- How might the incumbents respond to the threat of entry?