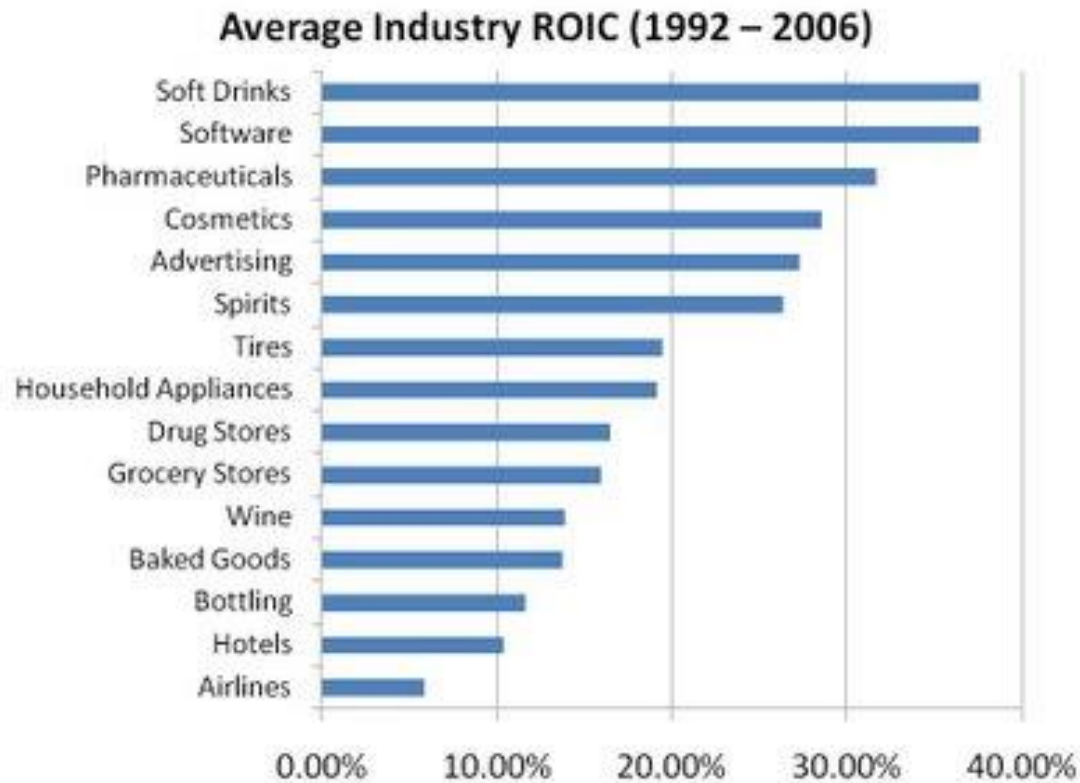# The Economics of E-commerce and Technology

Industry Analysis

10/6/2014

Industry Profits
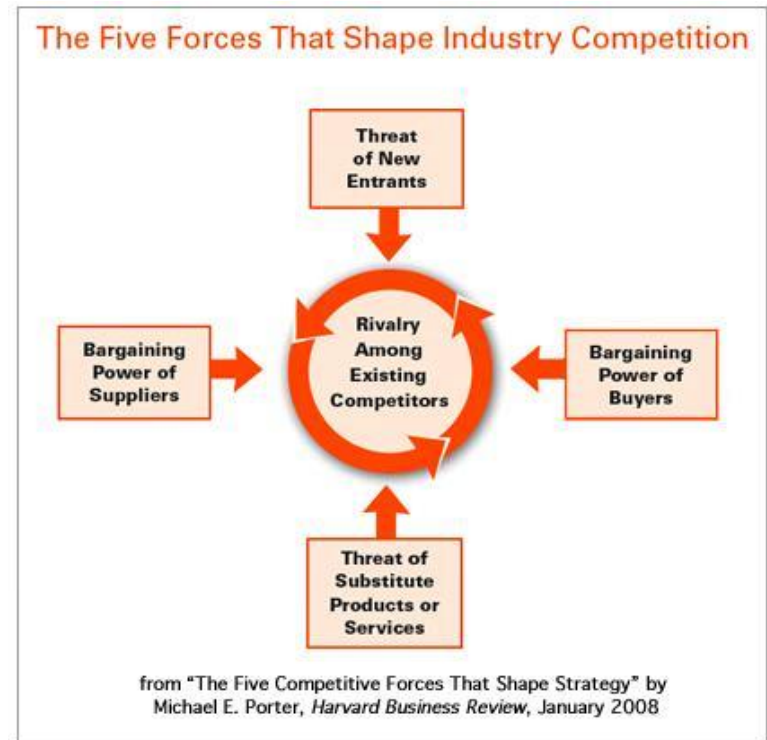
- In Econ 11, Economic Profits = 0
- In reality, many industries have much higher profits:

Average Industry ROIC (1992 – 2006)

Industry	ROIC
Soft Drinks	~38%
Software	~38%
Pharmaceuticals	~32%
Cosmetics	~29%
Advertising	~27%
Spirits	~26%
Tires	~19%
Household Appliances	~19%
Drug Stores	~16%
Grocery Stores	~16%
Wine	~13%
Baked Goods	~13%
Bottling	~11%
Hotels	~10%
Airlines	~6%

Industry Analysis

- ## Identify factors determining industry profitability.
  - Provides context for strategic analysis.
  - Analysis depends on market definition.

- ## Porter's "five" forces
  - Substitutes
  - Competitor Rivalry
  - New entrants
  - Buyer bargaining power
  - Supplier bargaining power
  - Complements

The Five Forces That Shape Industry Competition

Threat of New Entrants

Bargaining Power of Suppliers

Rivalry Among Existing Competitors

Bargaining Power of Buyers

Threat of Substitute Products or Services

from "The Five Competitive Forces That Shape Strategy" by Michael E. Porter, *Harvard Business Review*, January 2008

Force 1: Substitutes

▸ A firm's markup is determined by it's demand elasticity

$$\frac{p-c}{p} = \frac{1}{e} \quad \text{where} \quad e = -\frac{p}{q}\frac{dq}{dp}$$

▸ Which elasticity?

    ▸ Demand for smart phones is inelastic

    ▸ Demand for Samsung's Galaxy G3 is elastic

▸ What about strategic interaction?

    ▸ If I change my price, this may effect behavior of others

▸ Substitutes outside the market

    ▸ Ignore strategic interactions

▸ Substitutes inside the market

    ▸ Pay attention to strategic interaction

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Force 1: Substitutes

▸ Consider two products: What is a substitute?

  1. Price of x goes up, then demand for y goes up.

  2. If x and y indivisible goods, $V_{xy} < V_x + V_y$

▸ Degree of substitutability matters

  ▸ Affects how our firm interacts with competitors.

  ▸ Depends on type of product differentiation.

Force 2: Competitor Rivalry

▸ Bertrand benchmark

▸ Assumptions

  ▸ Two firms simultaneously set prices

  ▸ Constant marginal cost, c

  ▸ Firm with lowest price serves whole market

▸ Example: gas stations next to each other.

▸ What is elasticity of demand?

▸ What is equilibrium price?

Force 2: Rivalry

▸ **Dominant firm (e.g. eBay)**

   ▸ Biggest danger comes from new entrants.

▸ **Oligopoly (e.g. Dating sites – match, eharmony, jdate)**

   ▸ Competition and cooperation issues become interesting!

▸ **Fragmented (e.g. blogs)**

   ▸ Little strategy for fragmented industry.

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Force 2: Competitor Rivalry

▸ What determines how intense competition is?
▸ Product differentiation
    ▸ Real differences in products
    ▸ Switching costs
    ▸ Search costs
▸ Cost structure
    ▸ Supply side returns to scale
    ▸ Capacity constraints
▸ Network effects (demand side returns to scale)
▸ Collusion
    ▸ Explicit or tacit

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Force 3: New Entrants

- Incumbents often blind-sided by new products.
  - IBM and Microsoft/Intel
  - Microsoft and the internet.
- Are fixed costs an entry barrier?
  - Intuition: High fixed costs reduce entry, lower elasticity of demand and increase profits.
- Flaw in argument?
  - Profits are positive after paid fixed cost.
  - But what about ex-ante?
  - There needs to be incumbency advantage.

Force 3: Entry Barriers

- ▸ **Demand side**
  - ▸ Switching costs (e.g. TurboTax)
  - ▸ Demand-side returns to scale (network effects, e.g. MS Word)
  - ▸ Reputation (e.g. Apple)
- ▸ **Supply side**
  - ▸ Proprietary technology (e.g. patents)
  - ▸ Access to raw materials (e.g. Apple and flash memory)
  - ▸ Learning curve (e.g. NY Times)
- ▸ **Equilibrium**
  - ▸ The threat of post-entry price war. (e.g. CD Phone Books)
- ▸ **Strategy**
  - ▸ Should you preemptively block or fight entry?

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First Mover Advantage via Competition

- Suppose firm A is in industry.
  - Has marginal cost 5.
  - 100 customers with value 10.
  - A is currently charging p=10 and making $\pi=100(10-5)=500$.
- Firm B is considering entering
  - Has marginal cost 4 and fixed cost 150.
  - Good is homogenous.
- Should firm B enter?
  - If it enters, Bertrand competition implies price falls to p=5.
  - B's profits are $\pi=100(5-4)-150 = -50$.
  - B should not enter, anticipating the cut-throat competition.

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Force 4/5: Buyer/Supplier Bargaining Power

‣ **How big is the pie?**

- ‣ Potential pie = value of relationship.
- ‣ Ex-post costs of negotiation: market power (e.g. double marginalization), delay (e.g. strikes), bargaining costs (e.g. lawyers)
- ‣ Ex-ante costs of negotiation: underinvestment in relationship, cultivation of outside options. Called "holdup problem".

‣ **How is the pie split?**

- ‣ Long side vs. short side of market
- ‣ Concentration on each side of the market
- ‣ Power to commit to one stance
- ‣ Information

Example: Double Marginalisation

- Example (the cable business)
  - HBO sells input to TW; TW sells output to customers.
  - Market demand is q=100-p. Both firms have zero costs.
- Maximal Industry Profits
  - Charge p=50, sell quantity q=50. Profits = 50*50 = 2500.
- What if HBO charges transfer price t?
  - Then TW maximizes π_{TW}=(p-t)(100-p)
  - Chooses p=50+t/2 and sells q=50-t/2, treating 't' as input cost.
- What input price does HBO choose?
  - HBO maximizes π_{HBO}=t(50-t/2), implying t=50, q=25 and p=75.
- Firms charge more than monopoly price!
  - Intuitively, each firm exert negative externality on the other.
  - Can raise profits by merging or using two-part-tariff

Case Study: Nintendo

- Nintendo invented NES in 1983
  - Cheap hardware: 8-bit processor dated to 1970s.
- Limited power of software firm
  - Limited to 5 titles a year.
  - Exclusivity condition: games only for Nintendo.
- Limited power of retailers (e.g. Walmart, ToysRUS)
  - In 1988 retailers requested 110m units.
  - Supplied 33m units.
  - Threaten to cut off, if carry competitors products?
- Nintendo gets large slice of pie
- Danger: strategies reduce pie and invite entry

Force 6: Complementors

▸ What is a complement?
  1. Price of x goes up, then demand for y goes down.
  2. If x and y indivisible goods, $V_{xy} > V_x + V_y$

▸ Complementors make the pie bigger.

▸ Xbox and games
  ▸ When launched in 2001, not many games for Xbox
  ▸ It bought Bunjie and used "Halo" as launch title.
  ▸ Provide tools to encourage third party developers.

▸ Relation to platform market
  ▸ Xbox is platform where users interact with software.
  ▸ Not all platforms are for complementors: Google searchers may dislike ads.

Market Definition

- How define the market for Dell Desktop?
  - Other desktops? Laptops? Netbooks? iPads?
  - It depends what question you are asking!
- You should think about
  - Demand interactions: elasticity of substitution
  - Strategic interactions: whether firm A reacts to firm B's decisions.
- Case Study: Epson
  - Epson dominated low-end dot-matrix printers.
  - HP dominated the Inkjet and high-end laser printer market.
  - Epson in "wrong market", so launched cheap laser printer in 1989.
  - Price war: Laser prices fell, Inkjet prices fell, and dot-matrix market..?
  - Lesson: There's always a bigger market.

There's always a bigger market…

"Ha! We got him now!"

Example: Amazon's Book Business

▶ Substitutes:
  ▶ Inside market: other booksellers (online, offline), eBooks
  ▶ Outside market: libraries, magazines, TV etc.

▶ Buyers:
  ▶ Individuals. Buyer bargaining power: Little.

▶ Suppliers:
  ▶ Publishers, USPS. Supplier bargaining power: Varying.

▶ Rivals:
  ▶ Online/offline sellers. Small sellers, bookstores, superstores.
  ▶ Industry structure: Oligopoly with fragmented fringe.

▶ Entrants:
  ▶ Specialty sellers, other offline stores, Yahoo.

▶ Compliments:
  ▶ Broadband, reviews, credit cards.