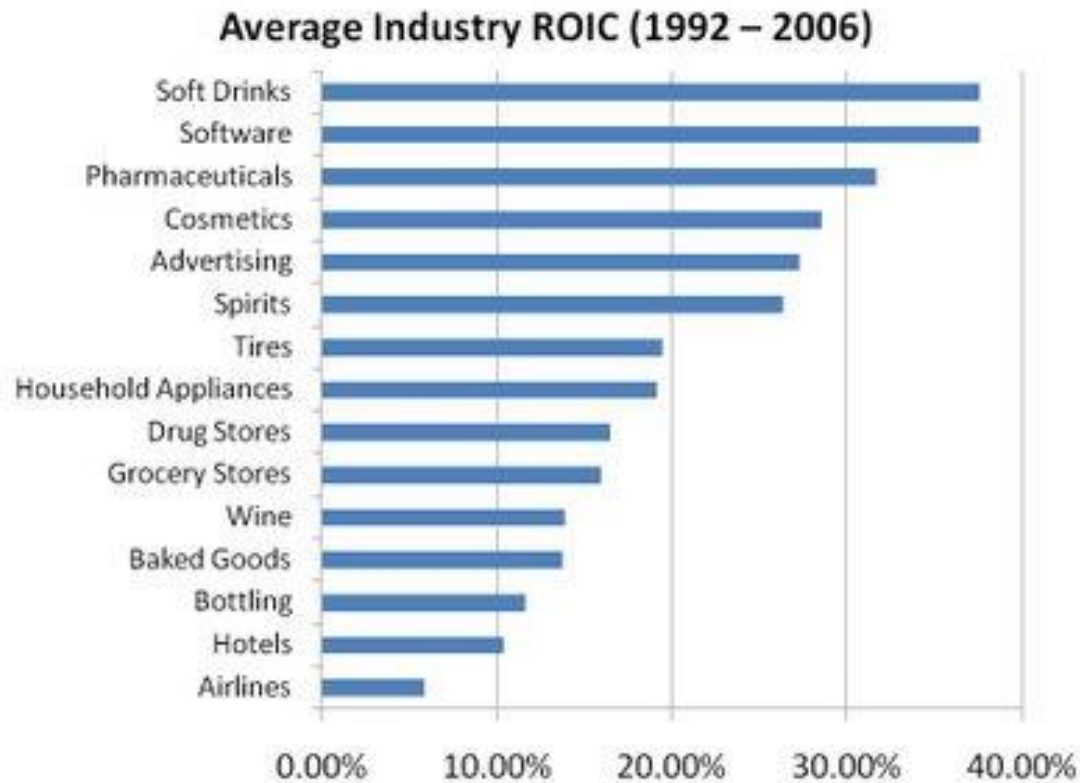# The Economics of E-commerce and Technology

Industry Analysis

Industry Profits

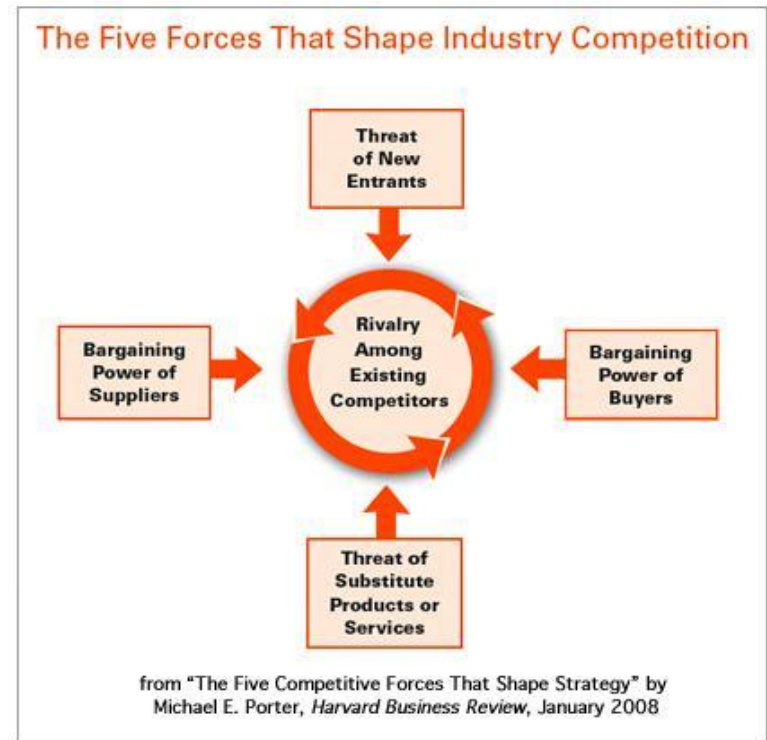▸ In Econ 11, Economic Profits = 0

▸ In reality, many industries have much higher profits:

Average Industry ROIC (1992 – 2006)

Industry	ROIC
Soft Drinks	
Software	
Pharmaceuticals	
Cosmetics	
Advertising	
Spirits	
Tires	
Household Appliances	
Drug Stores	
Grocery Stores	
Wine	
Baked Goods	
Bottling	
Hotels	
Airlines	

0.00%   10.00%   20.00%   30.00%   40.00%

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

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

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.

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.

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

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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, B&N, Walmart, Apple etc.
    - Industry structure: Oligopoly with fragmented fringe.
- Entrants:
    - Specialty sellers, other offline stores. Apple?
- Compliments:
    - Broadband, reviews, credit cards.