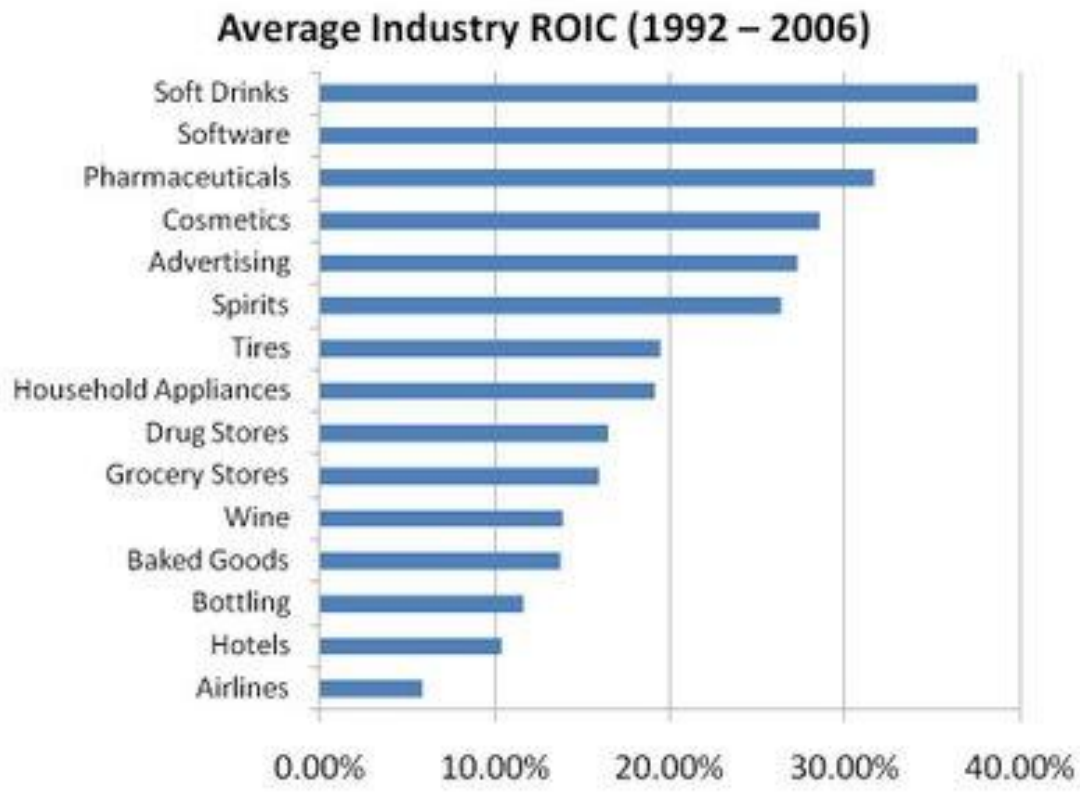
# The Economics of E-commerce and Technology

Industry Analysis

# Industry Profits

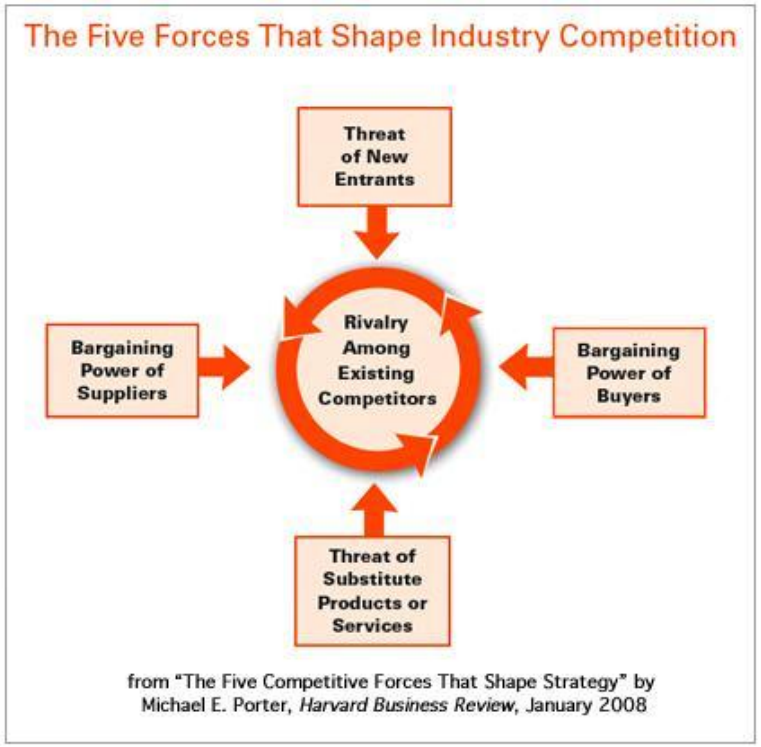
- In Econ 11, Economic Profits = 0
- In reality, many industries have much higher profits:



# 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



# 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

# 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. Google and engineers)
  - 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?

# 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

# 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 $\pi_{TW}=(p-t)(100-p)$
  - Chooses p=50+t/2 and sells q=50-t/2, treating 't' as input cost.
- What input price does HBO choose?
  - HBO maximizes $\pi_{TW}=t(50-t/2)$, 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

# Example: 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 buyers
  - In 1988 retailers requested 110m units.
  - Supplied 33m units.
  - Idea: Classic monopoly!
- Nintendo gets large slice of pie
- Danger: strategies reduce pie and invite entry

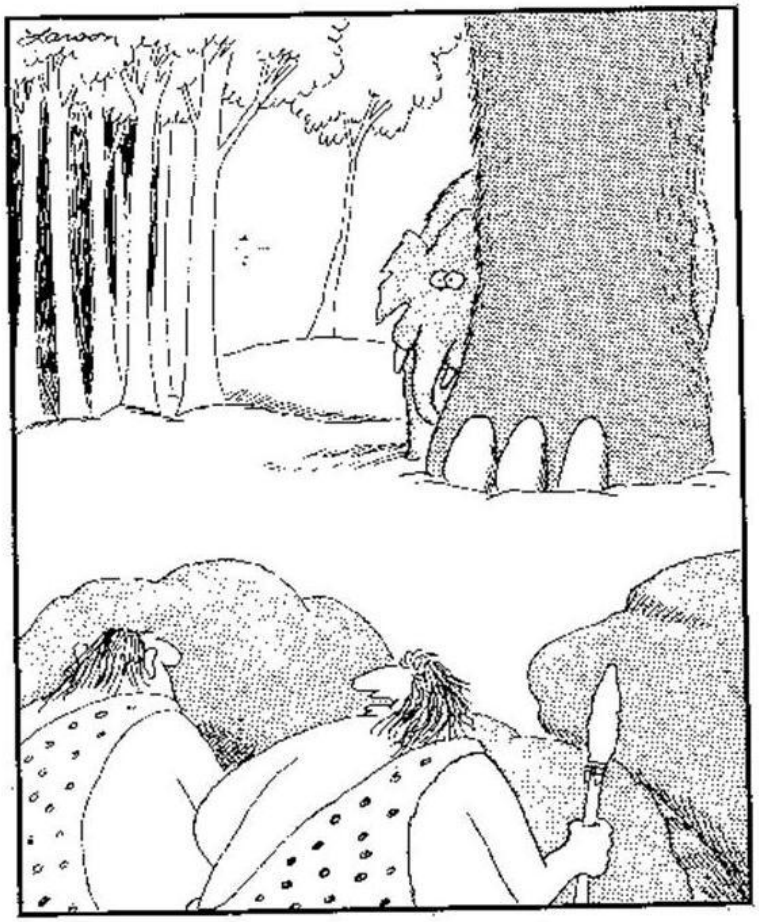
# Force 6: Complementors

- 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.
- 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.