Competition Policy in Network Industries

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Network industries are a large part of the world economy and some are growing very fast

- Telecommunications (data, voice)
  - Internet / world wide web
- Broadcasting
- Cable television
- Financial networks
  - Credit and debit card networks
  - ATMs, bank networks; payment systems; check clearing houses
  - Financial exchanges (equities, bonds, derivatives)
- B2B, B2C exchanges
- Electricity
- Railroads
- Airlines
- Roads
- **Virtual networks**
  - Computer software and hardware
  - Information servers (yellow pages, Yahoo, Google)

- Network industries often provide necessities
- There may be special competition policy issues arising out of key features of network industries

Logic of competition law

- Antitrust is to guard against restrictions of competition
- Efficiency (allocative, productive, and dynamic) is the desired outcome of antitrust policy, and competition is the means to achieve it
- Economic regulation have been established
  - in markets where it is clear that competition cannot be achieved by market forces
  - where the social and private benefits are clearly different
  - where deviation from efficiency is deemed socially desirable

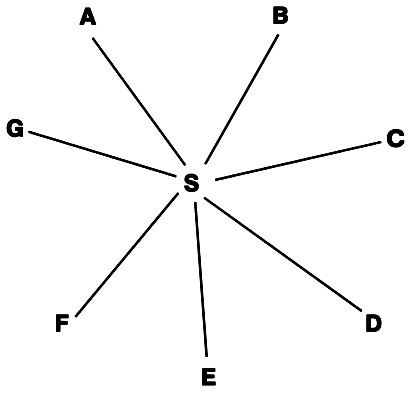
- Network industries have special features
- Is there a special case for or against antitrust scrutiny for network industries?

Special Features of Markets With Network Effects

- Increasing returns to scale in consumption (network effects)
- **A market exhibits network effects when the value to a buyer of an extra unit is higher when more units are sold, everything else being equal**

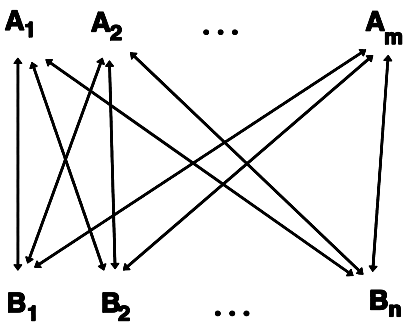
Special Features of Markets With Network Effects: Complementarities

- Network effects arise because of complementarities
- In a traditional network, network externalities arise because a typical subscriber can reach more subscribers in a larger network



Special Features of Markets With Network Effects: Virtual Networks

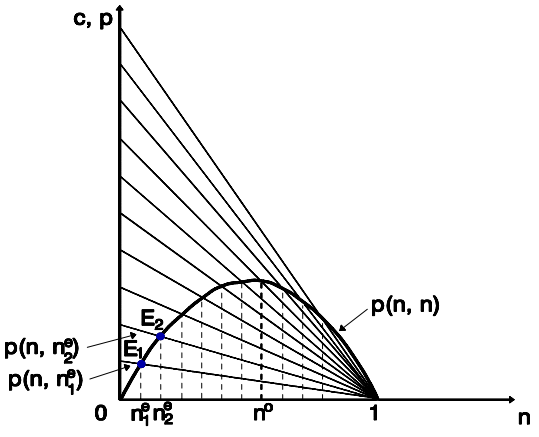
- In a *virtual network,* externalities arise because larger sales of components of type A induce larger availability of complementary components B_1, …, B_n, thereby increasing the value of components of type A



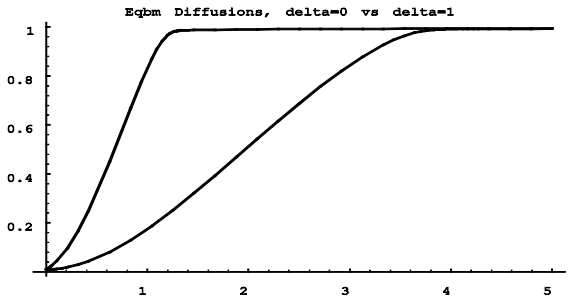
- Firms can make money from either side of a network or from both
  - from server or client (example Adobe Acrobat)
  - from caller or receiver
- Often the additional subscriber/user is not rewarded for the benefit that he/she brings to others by subscribing
- Hence there may be “externalities,” i.e., benefits not fully intermediated by the market

Demand can slope upwards

- The “law of demand,” i.e., that higher output can be sold only at lower prices, is violated when there are significant network effects: **demand curve can slope upwards**



The pace of market penetration is much faster in network industries than in non-network industries



Markets with strong network effects where firms can choose their own technical standards are "winner-take-most" markets

- In these markets, there is extreme market shares and profits inequality
- The market share of the largest firm can be a multiple of the market share of the second largest, the second largest firm's market share can be a multiple of the market share of the third, and so on
  - Example: 66%, 22%, 7%, 2.5%, 1%, ...
- Geometric sequence of market shares implies that, even for small n, the nth firm's market share is tiny
  - Examples: PC operating systems market; software applications markets
- Why? A firm with a large market share has more complementary goods and therefore its good is more valuable to consumers

In industries with significant network externalities, under platform incompatibility, monopoly may maximize social surplus

- When strong network effects are present, a very large market share of one platform creates significant network benefits for this platform which contribute to large consumers' and producers' surpluses
- It is possible that a breakup of a monopoly into two competing firms of incompatible standards *reduces* rather than increases social surplus because network externalities benefits are reduced
- *De facto* standardization is valuable, even if done by a monopolist

Natural inequality: "winner-takes-most"

- Because of natural inequality in the market structure network industries, there should be no presumption that anti-competitive actions are responsible for the creation of market share inequality or very high profitability of a top firm
- No anti-competitive acts are *necessary* to create this inequality
- The "but for" benchmark against which anti-competitive actions in network industries are to be judged should be not be perfect competition but an environment of significant inequality

Limited Effects of Antitrust Policy

- In markets with strong network effects, once few firms are in operation, the addition of new competitors, even under free entry, does not change the market structure in any significant way
- Although eliminating barriers to entry can encourage competition, the resulting competition may not significantly affect market structure
- In markets with strong network effects, antitrust authorities may not be able to significantly affect market *structure* by eliminating barriers to entry

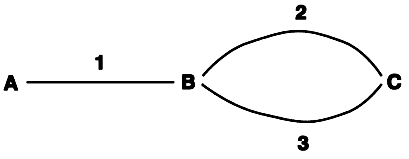
Competition *for the market* takes precedence over competition *in the market*

- Intense competition on which firm will create the top platform and reap most of the benefits
- Example: Schumpeterian races for market dominance among dot-coms in 1999-2000
  - Very high valuation of dominant vs. other dot-com firms in that period; Wall Street perception
  - Strategic effect: firms advertised very intensely and subsidized consumers to achieve a dominant position

Path-dependence is the dependence of a system or network on past decisions of producers and consumers

- Today's sales of Windows are path-dependent because they depend on the number of Windows sold earlier (the installed base Windows).
- The existence of an installed base of consumers favors an incumbent
- However, competitors with significant product advantages or a better pricing strategy can overcome the advantage of an installed base
- Example: VHS overcame Beta after six years of higher installed base by Beta
  - Sony's mistakes in disregarding network externalities and not licensing the Beta format
  - JVC's widespread licensing of VHS
  - One low-end, low-price VHS player can contribute as much to the network effect as a high-end high-price Beta player

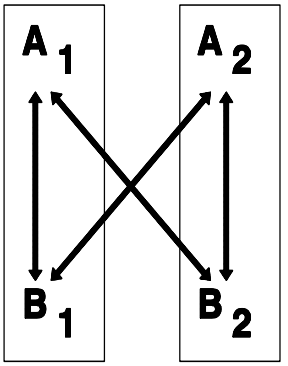
One-sided bottlenecks



- The early AT&T was in possession of links 1 (long distance) and 2 (local), but did not allow an independent firm which possessed link 3 to interconnect at B and provide part of the long distance service CBA
- For over two decades in the beginning of the 20th century, AT&T refused to interconnect independent local telecommunications companies to its long distance network, unless they became part of the Bell System, resulting in 89% market share for AT&T by 1935

Two-sided bottlenecks

- Each of two firms is monopolist, each with a different bottleneck, and each firm requires the other's bottleneck to produce its output
- Two local telephone companies, each customer subscribes only to one local telephone company, and each company requires the other's network to complete calls
- Calls originate at A1, A2 and terminate at B1, B2.
- Termination charges at B1, B2 for calls from the rival network can be used to disadvantage and foreclose the rival network
- Example: New Zealand
- Problem in U.S. telecommunications solved by setting equal termination fees (reciprocity); unsolved in ATM and credit card networks



Leveraging of market power across markets

- Various types of exclusionary arrangements
- Instruments:
  - Technical standards
  - Bundling and other pricing strategies
  - Non-price discrimination strategies (raising rivals' costs

Leveraging Example

- In the middle 1980s Nintendo refused to allow third party games (software) to play on its game console (hardware) unless the software manufacturers agreed not to write a similar game for two years for competing game systems
- Nintendo used the dominance of the game market at that point in time to coerce developers to write software just for its platform, and thereby increased the value of the Nintendo virtual network (of hardware and software)
- Practice stopped under threat from DOJ

- Issues in “after-markets” where consumers are “locked-in” a durable good or service arises out of commitments of durable nature
- Examples
  - refusal of Kodak to supply to repair companies parts for Kodak photocopiers
  - lack of email address portability for ISPs
  - early lack of number portability for wireless phones

Example from computing industry: subsidizing complementary goods

- Firm A chooses to make its product incompatible with others
- Firm A subsidizes firms that produce complementary goods
- Alternatively, firm A subsidizes its division that sells complementary goods
- As a result
  - The value of firm A's product increase
  - The entry hurdle of firm A's rivals increases
  - Possible creation of market power, but action also has pro-competitive justification

- Incompatibility is a *necessary* condition for possible creation of market power
- Key to increasing social welfare: public standards, compatibility
- But, it is very difficult for US antitrust authorities to intervene and/or define standards
- Also, imposing compatibility can reduce incentives to innovate

B2B and other exchanges issues

- Many proposed B2B exchanges are run by the firms that also are trading; examples
  - ENRON ("we want to be on one side of every transaction")
  - COVISINT; automakers squeezing parts manufacturers
  - CISCO suppliers exchange
- Can help cartelization or create monopsony
- Traditional price fixing issue at NASDAQ

Dynamic efficiency issues

- Static efficiency may lack in dynamic efficiency
- Possibility of a lock-in to a technology which, when decisions taken in every period, looks optimal given past decisions, but is sub-optimal if decisions are delayed and all the decisions are taken at once
- Lock-in may occur as a consequence of the race to be a dominant firm in a network industry

Innovation issues

- Efficiency and intensity of innovation in monopoly compared to competition is an open question in economics

Criteria to be used for intervention

- Benchmark anti-competitive actions against a network industries equilibrium
- Were consumers (past, present, future) harmed by specific actions?
- Competitors' harm not sufficient reason for intervention
- Caution on guessing on how a high tech industry would have evolved but for the anti-competitive action(s)
- Monopoly may maximize total surplus
- It may not be possible to sustain a long-term equal market shares equilibrium, and a short term equal market shares equilibrium may have low total surplus
- Path dependence and the value of installed base are limited by Schumpeterian competition, and upheavals are not uncommon in network industries

Drawbacks of regulation

- Regulation it is best suited for industries with well defined and not changing products and services
- Regulation is not well suited in industries with rapid technological change and frequently changing product definitions
- Regulation can be used by the regulated companies to keep prices relatively high, as exemplified by telecommunications regulation
- Often regulators are very close to the interests of the regulated parties rather than to the interests of the public
- Often regulators are not well informed about key variables as well as changes in the industry

Drawbacks of regulation

- Regulators at both the state and federal levels are under pressure and influence by both the executive and the legislative part of government, and cannot be as impartial as a court
- There is a tendency for regulators to expand their reach into related and new markets
- These drawbacks can create significant surplus loss due to regulation