The Economics of Networks
(Nicholas Economides, 1996)

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Presentation Overview

• Classification of Networks
• Network Externalities
• The ‘Macro‘ Approach
• Compatibility v. Incompatibility
• Network externalities & Industry structure

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Classification of Networks

- Many components of a network are required for provision of a service
- Thus, network components are *complementary*

- ‘Two-way’ networks (e.g. railroad, road...)
- ‘One-way’ networks (e.g. broadcasting, paging...)
- A pair of *vertically-related* industries is formally equivalent to a *one-way* network

Network Externalities

- Consumer’s benefit from owning a product increases when the (expected) number of other consumers increases

- *Direct externalities*: Buyers form a network of users who communicate with each other
- *Indirect externalities*: Due to *IRS* in production a greater number of complementary goods can be supplied - at *lower price*
Network externalities

- **Direct externality** (e.g. internet, telephone, fax...)
- **Indirect externality** (e.g. PCs/software, CD players/CDs...)

‘Macro’ Approach

- **Perfect Competition**: multiple equilibria possible; adoption externality
- Social marginal benefit > private marginal benefit
- Thus, Smaller network than is socially optimal

- **Monopoly**: restricts production to max. profits
- Consumers + total surplus will be lower than in pc
- *Existence of network externalities cannot be claimed as a reason in favour of a monopoly market structure*
‘Macro’ Approach

- *Oligopoly under incompatibility*:

- Profit maximising firms may not achieve industry-wide compatibility while this would be socially optimal (Katz, Shapiro, 1985)
- If standardisation costs are different, firms play a standard co-ordination game
- No guarantee that the highest joint profit standard will be adopted

Compatibility v. Incompatibility

- Consumers demand product $AB$, not components $A \parallel B$
- Relative demand will determine compatibility, i.e. $A_1B_1$ v. $A_1B_2$

**Examples**

- Apple iPod and Microsoft Windows Compatibility
- MSN Messenger Service and 3rd Party Clients (Trillian, etc.)
Consequences of Compatibility

- Higher prices than an integrated firm
  
  1. If the price of $A_1$ increases then…
  2. Profit loss in system sales ($A_1B_1$) > profit loss in one component ($A_1$)

  *Since profits are more sensitive to price under incompatibility, integrated firms will price lower than disintegrated firms*

- Lower quality than an integrated firm

Network Externalities and Industry Structure

- Invitations to Enter
  - Network effect v. Competitive effect

  For example:
  
  Divx – licenses playback codec
  Google – licenses search technology
Important Findings

- **Network externalities**: Large networks are more attractive to users than small ones $\Rightarrow$ consumer expectations matter; ‘tippy’ markets (e.g. VHS v. Beta)
- **Market competition between systems**, as opposed to competition between individual products
- Analyzing networks with the “micro” approach is useful, but must be taken in a real world context for real business decisions.