



THE UNIVERSITY
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BUSINESS SCHOOL

Department of Economics

08 Network Effects 5

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Reading: *Cabral*, Ch 17

Introduction

- **Objectives of this lecture:** Understand the implications of compatibility for profits and economic welfare.

Examine the incentives for compatibility among existing networks and new networks.

Discuss strategies for competing with a new network.

Understand the dynamic nature of competition in network markets.

Summary and review of this topic.

Compatible or Incompatible?

- Between symmetric firms, compatibility generally *softens* competition and leads to higher prices and higher profits.
- Symmetric firms will thus have an incentive to make their networks compatible, provided that the cost of achieving compatibility is not too high.
- In spite of the higher prices, compatibility may also make consumers better off, if consumers value larger networks highly (network effects are strong).

Compatible or Incompatible?

- Suppose network effects are very strong (very important relative to quality or brand differences), networks are symmetric, and compatibility is not too costly to achieve.
- Firm's point of view:
 - Profit is highest under monopoly.
 - Compatible competition is second best.
 - Incompatible competition is worst.
- Welfare point of view (consumer surplus + profits):
 - Welfare is highest under compatible competition.
 - Monopoly is second best.
 - Incompatible competition is worst.
- There is a tradeoff between *intensity of competition* and *benefits from network size*.

Compatible or Incompatible?

- However, these results may change if quality differences or brand differentiation are very important to consumers, relative to network effects.
- For example, if brand loyalty is very strong, welfare may be higher under incompatible competition compared to monopoly.

Compatibility and New Networks: Fight or Share?

- The above comparison of compatibility and incompatibility was in the context of two existing symmetric networks.
- What about the case of two firms establishing new networks in a new market?
- Ultimately, both firms would hope that they could drive the other firm out and become a monopoly (monopoly profits are highest).
- Compatibility makes it easier for rivals to stay in the market.

Compatibility and New Networks: Fight or Share?

- New networks face a choice:

Be compatible and accept a smaller share of market profits

OR

Be incompatible and hope to become the biggest network and drive rivals out.

- With many competitors, the probability of being the winner may be low – better to accept compatible competition.

Compatibility and New Networks: Fight or Share?

- Example: Adobe PDF
 - Adobe made the PDF standard open.
 - Anyone can produce PDF reader/writer software in competition with Acrobat.
 - Makes the total market bigger and more stable, but Adobe must share some profits with rivals.
- Example: Apple's FairPlay DRM
 - Music with DRM purchased on iTunes can only be played on iPods.
 - Music with DRM for iPods must be sold through iTunes.
 - Apple keeps all profits, but may face more intense competition from rivals.

Competing with an Existing Network

- How can a new firm enter a market where a large network already exists?
- The existing network may act as a *barrier to entry*, since consumers will place low value on the new network when it is small.
- Ways the new firm can overcome this problem:
 - Offer a *higher quality* product (e.g. through technological progress).
 - Charge a *lower price*.
 - *Differentiate* the product or try to establish *brand loyalty*.
 - Make the new network *compatible* with the existing network (one-way compatibility).

Competing with an Existing Network

- Example: OpenOffice
 - Competes with Microsoft Office.
 - Price is lower (free!).
 - Compatible (not quite perfect) with MS Office file formats.
 - Different features (better quality?).
 - Different user interface (brand loyalty).

Competing with an Existing Network

- A large existing network may not like a new network to be compatible.
 - Makes it easier for customers to switch to the new network.
- Firms may try to keep technical details secret or use patents to prevent compatibility.
- Example: In early 1990s, Nintendo tried to use a patent on its technology to prevent Atari from developing games that were compatible with its NES game system.

Dynamic Competition

- Competition in markets with strong network effects may 'look' quite different to competition in regular markets, especially when networks are incompatible.
- In early stages of a new technology, firms may compete strongly to become the dominant network.
- Then one firm gets an advantage (somehow) and establishes a dominant position.
- Firms compete *for* the market rather than *in* the market.

Dynamic Competition

- Examples:
 - Operating systems: Apple vs Microsoft in 1980s.
 - Search engines in 1990s.
 - HD-DVD vs Blu-ray.
- Expect to see sequence of “bargain then ripoff” pricing.
 - Initial low prices as firms compete *for* the market.
 - Prices increase once one firm becomes dominant.
- Example: Prices for Blu-ray players increased once HD-DVD was defeated.
- Network competition often characterised by a *sequence of monopolies*.
 - Periodic intense competition as existing technology replaced by a new one.

Dynamic Competition

- Need to take a long-run perspective when assessing the intensity of competition in network markets.
 - Early competition can seem very intense.
 - Later competition can seem very weak.
- Network competition can be quite *unstable* in the early stages, with small advantages or disadvantages having big effects.
- Network markets are prone to *tipping*.
 - Small initial differences in market share can result in large differences later on.

Summary of Economic Insights

- Consumer expectations of the network size are crucial in determining the level of demand.
- Both small and large network sizes can be consistent with the same price, depending on consumers' expectations.
 - Coordination problems
- Consumers' initial expectations affect the ease with which a network can achieve critical mass, for a given price.
- Network effects can mean that history matters a lot for the future evolution of a network market.

Summary of Economic Insights

- Value of a network
 - Value of a network increases with the network size.
 - But increasing returns don't necessarily last forever
 - Additional connections to the network may give diminishing marginal value.
- Pricing
 - Consumers' expectations can be as important as pricing in determining a firm's success.
 - Lower prices make it easier for a network to achieve critical mass, for given expectations of consumers.
- Expectations can be influenced by marketing, commitment, reputation and information.

Summary of Economic Insights

- Two potential sources of deadweight loss:
 - Usual deadweight loss: Imperfectly competitive firms set prices above marginal cost, which reduces the network size.
 - Additional network deadweight loss: The smaller network due to above-cost prices means that those who do join the network are worse off than they would otherwise be.
- Competing networks
 - Competing networks must consider the impact of the actions of their rival(s) not only on the residual demand available to them, but also on the willingness to pay of consumers to join their network.
 - Network size differentiates networks from consumers' point of view.

Summary of Economic Insights

- Compatibility
 - Compatibility can soften competition between firms and increase profits.
 - Compatibility may also be good for consumers if the benefits of having access to a larger network outweigh the price increase.
 - Firms may have an incentive to make their networks compatible if it is not too costly and if it reduces the intensity of their competition sufficiently.
 - Compatibility may be an effective way for a new network to compete with an existing one.

Summary of Economic Insights

- Over time, competition in network markets may look different from other markets:
 - Sequence of monopolies, with periods of intense competition driven by technological change.
 - Bargain-then-ripoff pricing.
 - Tipping and instability.
- All these conclusions can change when network effects are not important compared to quality or brand differences (intrinsic utility).