Network Externalities

SI 646

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Competing against, and planning for information technology is hard


SONY
PHILIPS


SONY
PHILIPS


PHILIPS

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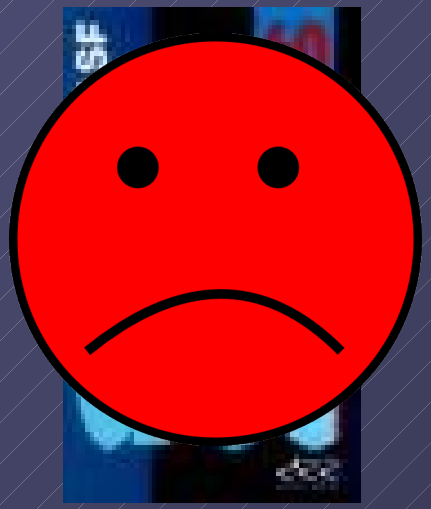

SONY + PHILIPS + TOSHIBA

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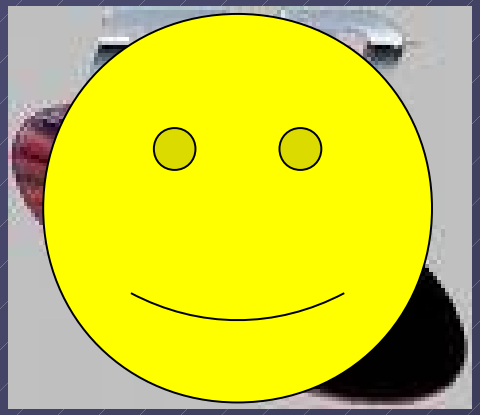


You want to make wise decisions about multi-million $ investments.

How do you anticipate the pitfalls *before* committing?

Anticipate by recognizing features common to many challenges

Recognizing and *understanding* network externalities helps you plan, compete, evaluate.

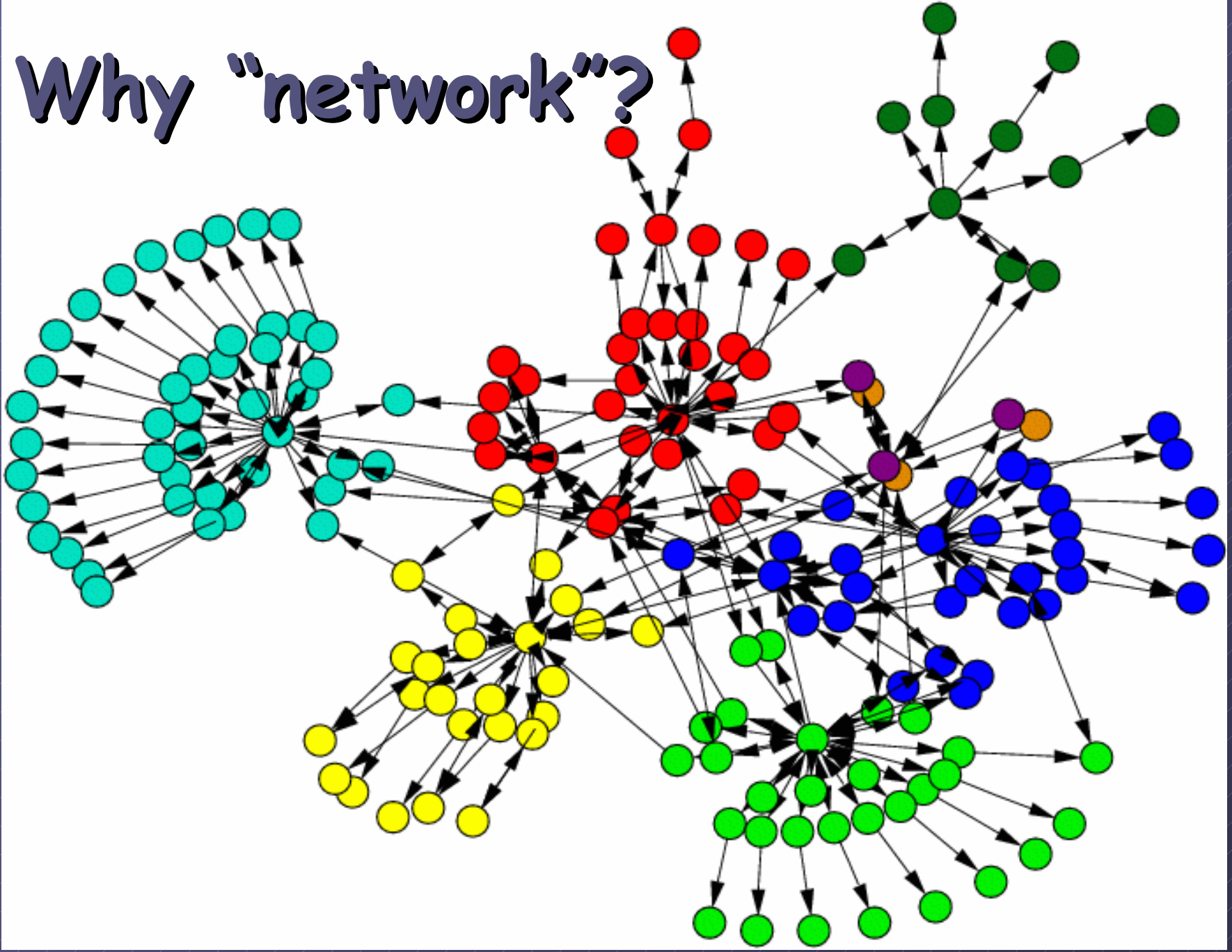
CHAPTER 1:
What are network externalities?

What are common features of CD (yay!) and DAT (boo!) problems for Sony & Philips?

Network…

Externalities…

Why "network"?



Source: Undetermined

Networks offer *substitutes*
composed of *complements*

What is *not* a network?

Tightly coupled

Key: Strong complementarities.

Multilateral dependencies

Externalities are…?

Why "externalities"?

What are examples of network externalities in…

information technologies?

What are examples of network externalities in…

information goods?

What are examples of network externalities in…

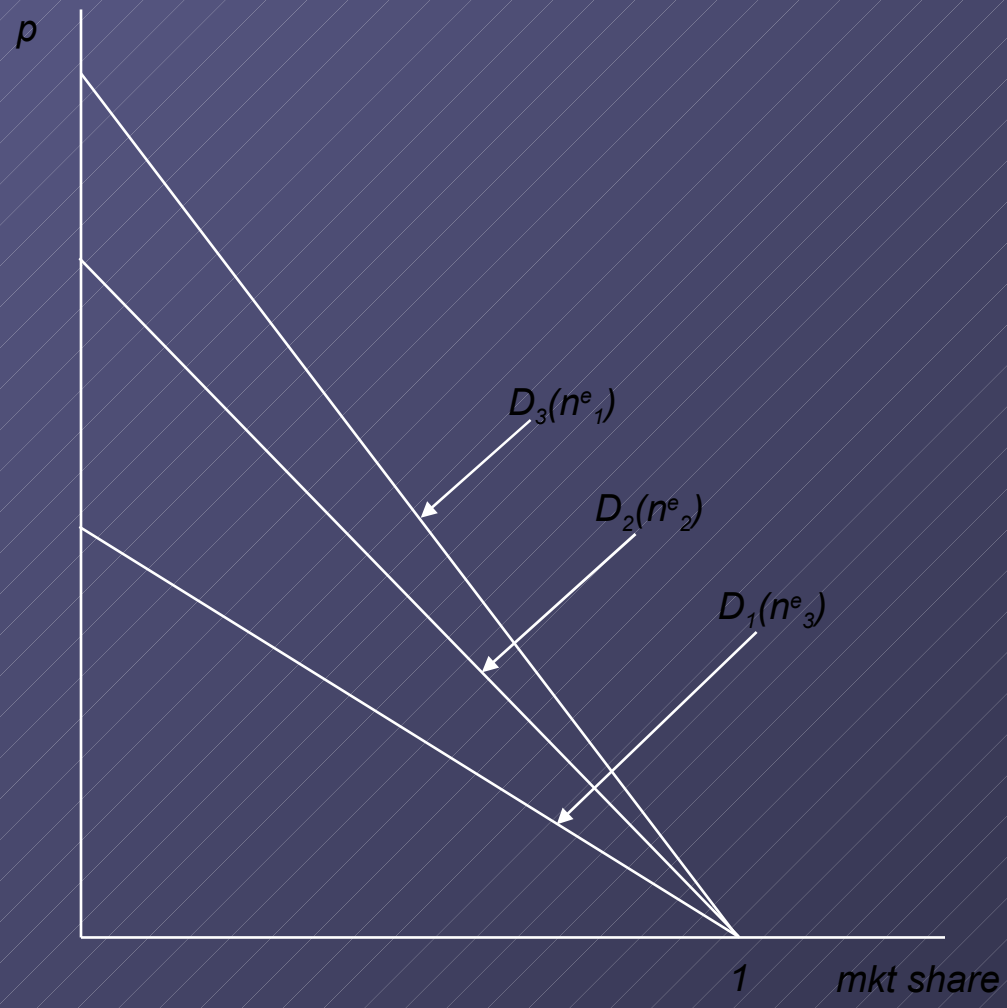
information distribution?

CHAPTER 2:
How do network externalities work?

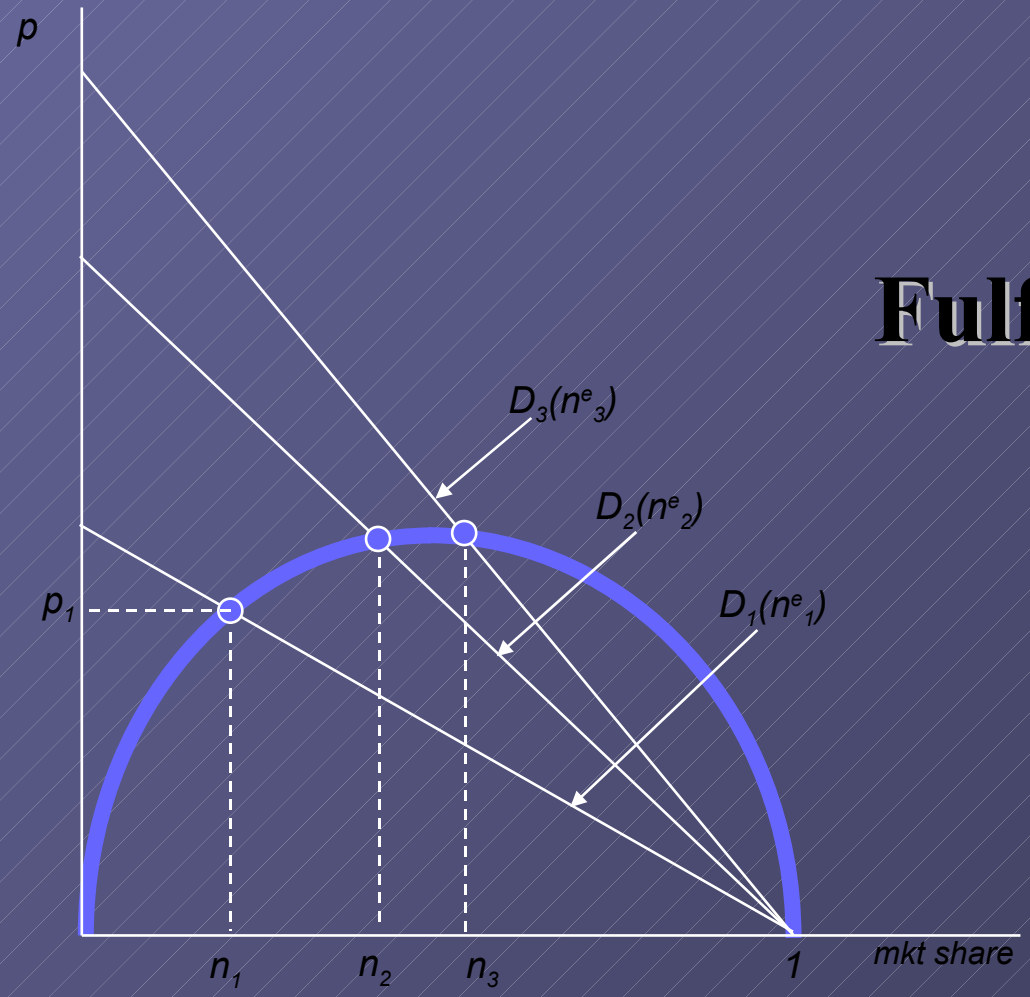
- Let $p(i,n_e)$ be the amount the *i*th user is *willing to pay* when she expects n_e other users
- $p(i,n^e)$ is *increasing* in n_e:

$$\frac{\partial p(i,n^e)}{\partial n^e} > 0$$

Defn: Value to a user increases in the number of other users



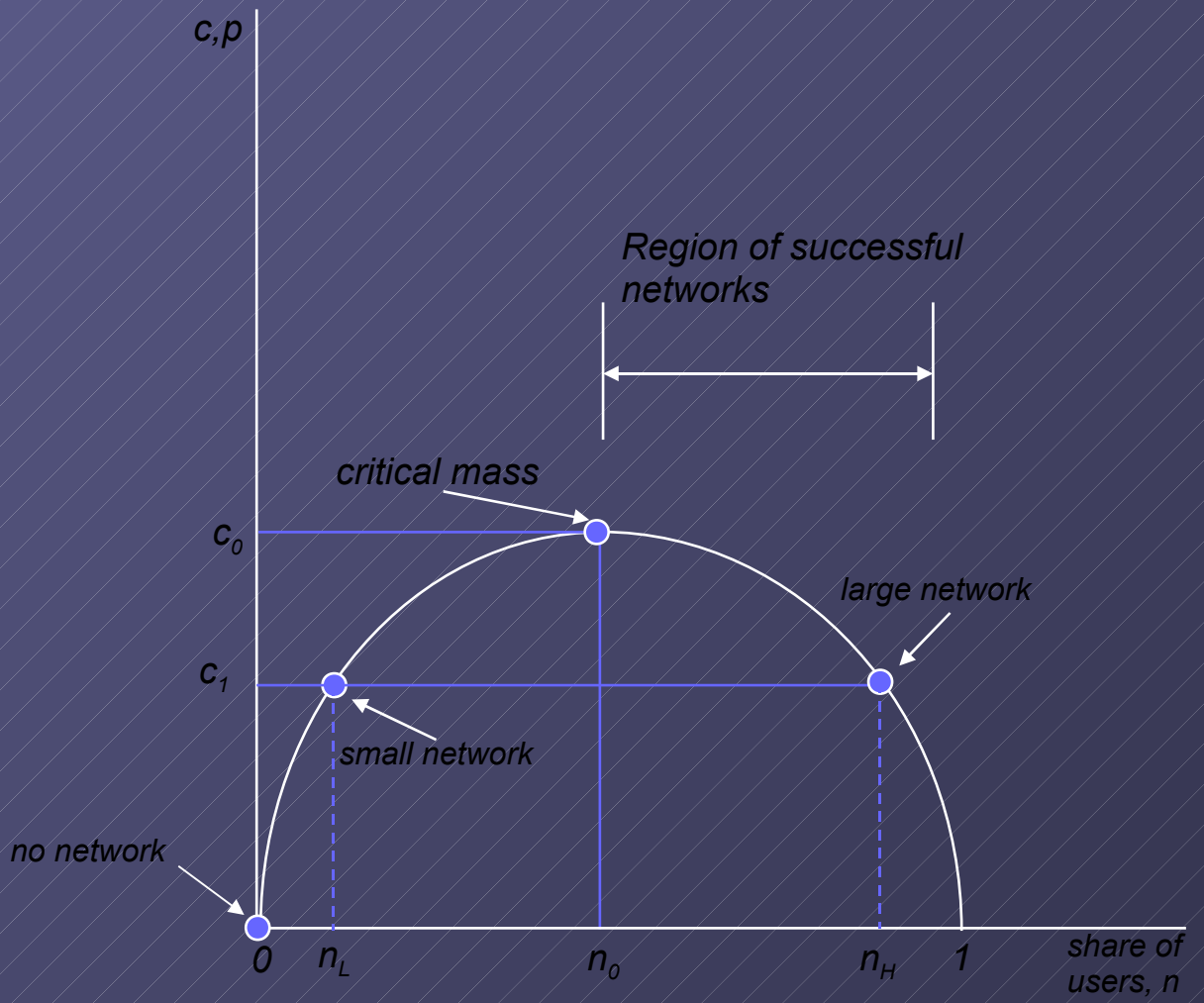
So, there's a different demand curve for each level of expected usage



Fulfilled expectations:

$$n = n^e$$

Market is in equilibrium when demand is based on expected usage equal to actual usage



Key feature in such markets is *critical mass*

	Network effects		
Demand for Variety		Low	High
	Low	unlikely	high
	High	very low	depends

Tipping likely?

Tipping: When successful, product penetration can be very fast

Excess inertia: Successful networks tend to be large, entry is tough

Give an example of a standard that tends to promote excess inertia

Natural monopoly: Network externalities push toward one supplier

Supply-side natural monopoly:

When cost of building an alternative is economically prohibitive

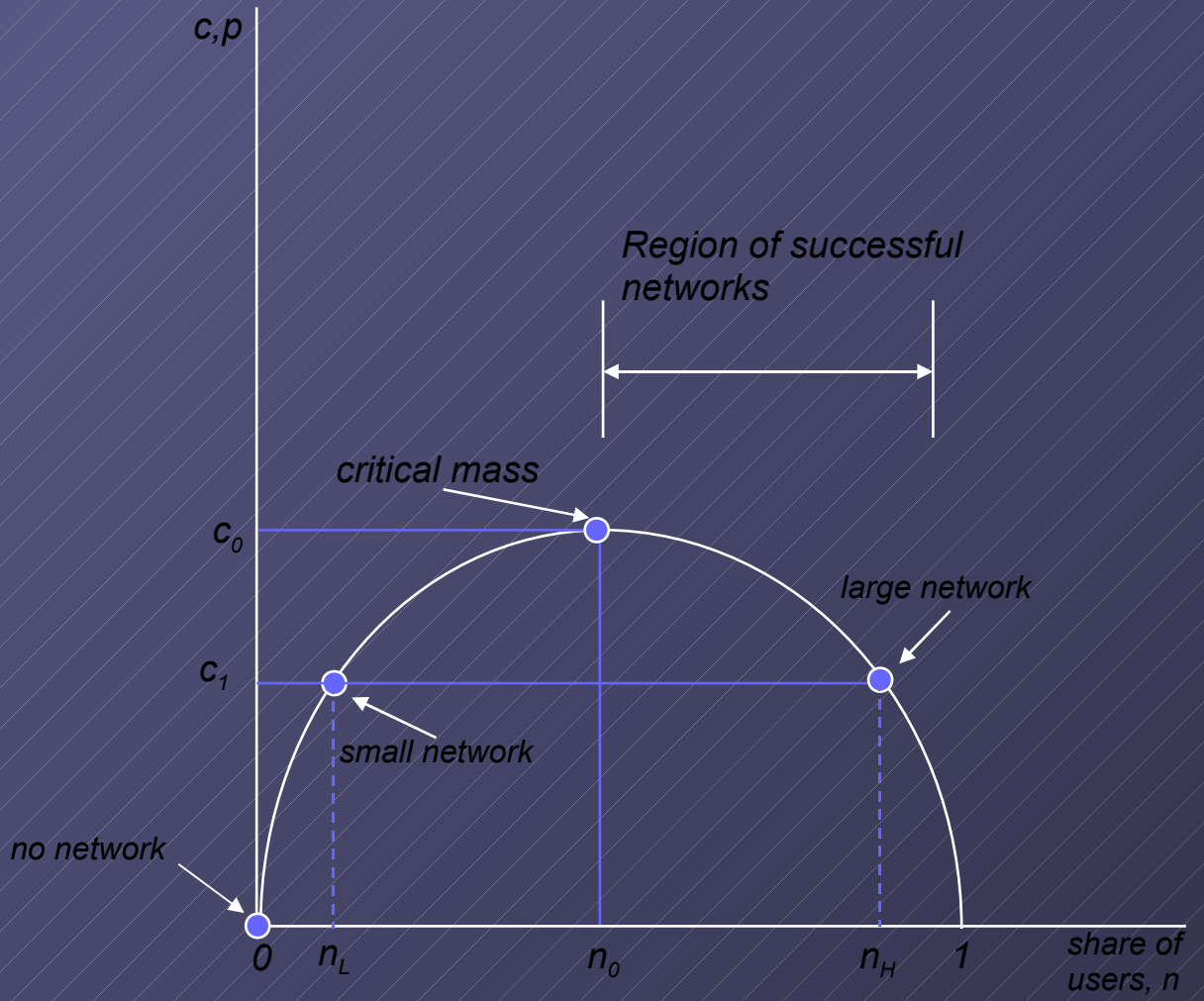
If there are two sets of customers, A and B, and C(x) is the cost of providing service,
then there is a natural monopoly if:

$$C(A+B) < C(A) + C(B)$$

(cost subadditivity)

Supply-side natural monopoly

Demand-side natural monopoly:



Large user network benefits tendency to make small networks disappear, large networks emerge and survive

Should we do something about network externality natural monopolies?

Liebowitz and Margolis: Usually no!

CHAPTER 3:
How do we play the game?

Increases consumer switching costs

Exploits coordination efficiencies

Reduces consumer confusion, search costs, finger pointing, risk

Succeed by closing the platform

Encourages partners

Stimulates innovation

Reduces consumer risk

Succeed by opening the platform

Succeed by buying critical mass

Use critical mass in one layer of a vertical chain of complements to grab critical mass in another layer

Case discussion