

Platform Industries: How Telecoms, Software,  
Credit cards, Media, and Videogames Differ  
from Other Markets, and What it Means for  
the Future of the Economy

**CARL SNYDER LECTURE**

UC Santa Barbara, April 25, 2006

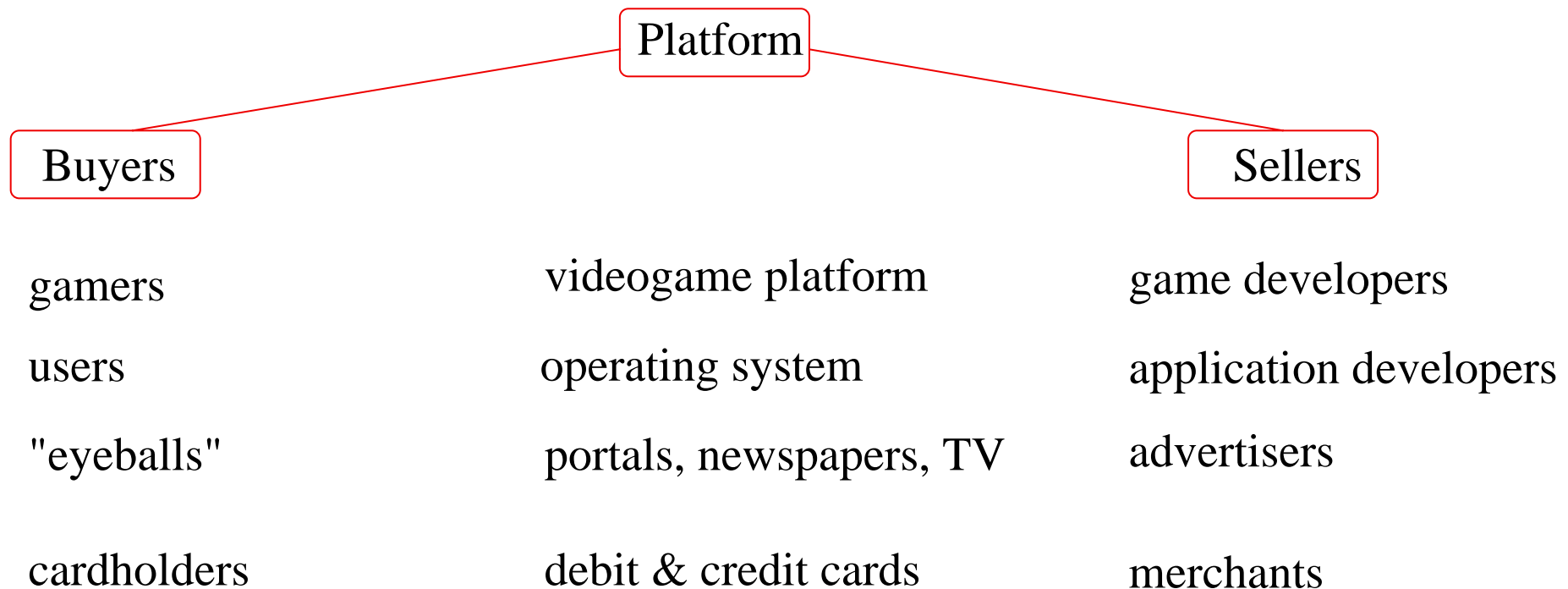
Jean Tirole

Institut d'Economie Industrielle (IDEI), Toulouse

( based on joint work with Jean-Jacques Laffont, Patrick Rey,  
and Jean-Charles Rochet)

# I. GETTING MULTIPLE SIDES ON BOARD

- ✓ Examples of *two-sided markets*:



- ✓ Chicken and egg problem. Must get both sides on board/court each side while making money overall.

## *Some other 2SPs:*

### *Exchanges*

- ✓ Exchanges/auctions (eBay, Amazon).
- ✓ B2B.
- ✓ Employment agencies.
- ✓ Dating services.
- ✓ Real-estate agencies.
- ✓ Futures and securities exchanges

### *Communications*

- ✓ Telecoms.
- ✓ Internet backbone services.

### *But also...*

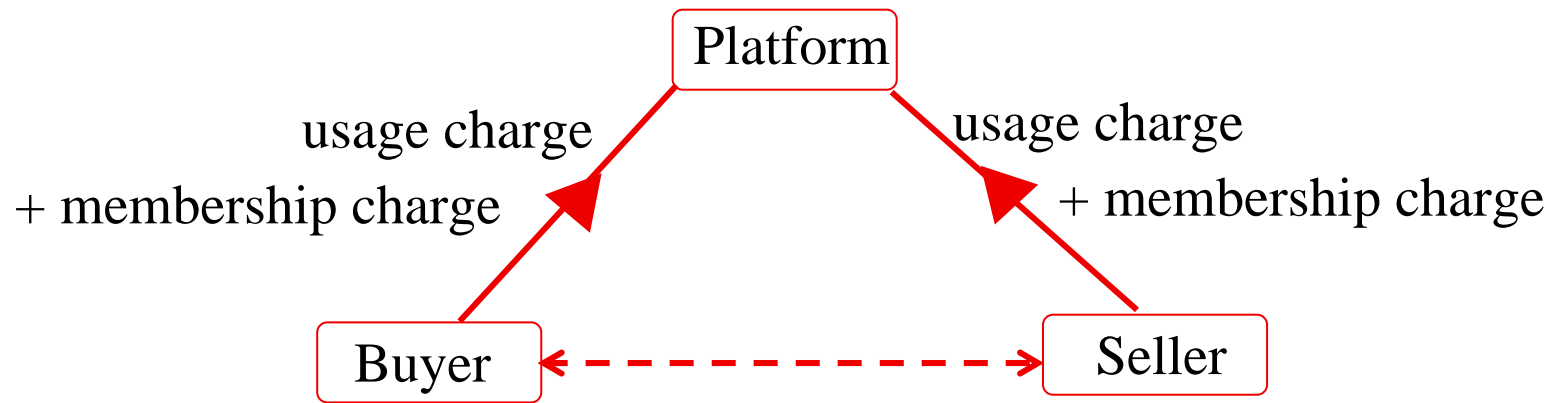
- ✓ Academic journals.
- ✓ Shopping malls.

*Two-sided markets raise new questions:*

👉 Price *structure* receives attention from:

- ✓ *platform managers*, whose price structure reflects:
  - elasticities and externalities,
  - platform competition,
  - multi-homing (examples: payment cards, software, real estate,...).
  
- ✓ *policymakers*: termination charges, interchange fees, broadcasting regulation (ceilings on adverts, ...), software (legitimacy of "cross-subsidies", impact of tying,...)..

# Platform enables or facilitates interaction between "buyers" and "sellers"



Industry	Usage fee	Membership fee
payment cards	<i>B</i> : cash-back bonuses	<i>B</i> : yearly fee
	<i>S</i> : merchant discount	
e-Bay	transaction fee	<i>S</i> : listing fee
operating systems		<i>B</i> : OS price
		<i>S</i> : development kit price (APIs free)

# OUTLINE

## *Two-sided market strategies*

- ✓ price structures
- ✓ other business strategies
- ✓ what is a two-sided market?

## *Competition among platforms in the absence of interconnection*

## *Interconnected platforms*

## *Looking ahead*

What we still don't know about two-sided markets.

## II. THE CHOICE OF A BUSINESS MODEL: GENERAL PRINCIPLES

- (1) *Charge according to what each side can bear and mind the cross-group externalities*
- ✓ Account for elasticities of demand on both sides: price structure should aim at getting both sides on board, not at allocating costs "fairly".
  - ✓ Account for surplus generated on the other side:  
high value to other side → low price on this side, high price on other side; and conversely.

Most obvious example: advertising-supported portals, TV networks and newspapers.

- ✓ Standard formula for profit maximization:

$$\frac{\text{price} - \text{marginal cost}}{\text{price}} = \frac{1}{\text{elasticity of demand}}$$

Elasticity = % variation in demand for 1% decrease in price.

- ✓ Example: price to buyers.

Cost = *opportunity cost*, smaller than cost incurred in serving buyer: attracting extra buyers generates revenue on seller side either through usage charges or by being able to increase sellers' membership fees.

- ✓ Price will be low/zero/negative if

- presence of buyer generates substantial revenue on seller side (low effective marginal cost),
- buyer side reluctant to get on board (elastic demand).

Often results in very *skewed pricing pattern*

[under EC competition law, dominant 2SP could be accused of predatory pricing on one side and excessive pricing on the other.]

- ✓ *Illustration # 1: Encoding vs. reading*
  - Adobe Acrobat, Text Processors, MP3 patents: free reader, charge or royalties for encoding.
  - Contrast: book or movie.
  
- ✓ *Illustration # 2: why did credit cards and debit cards adopt so markedly different business models?*
  - *Credit* (Visa, MasterCard, Amex): high merchant discount, low (negative) cardholder price.
  - *On-line debit*: low merchant discount.

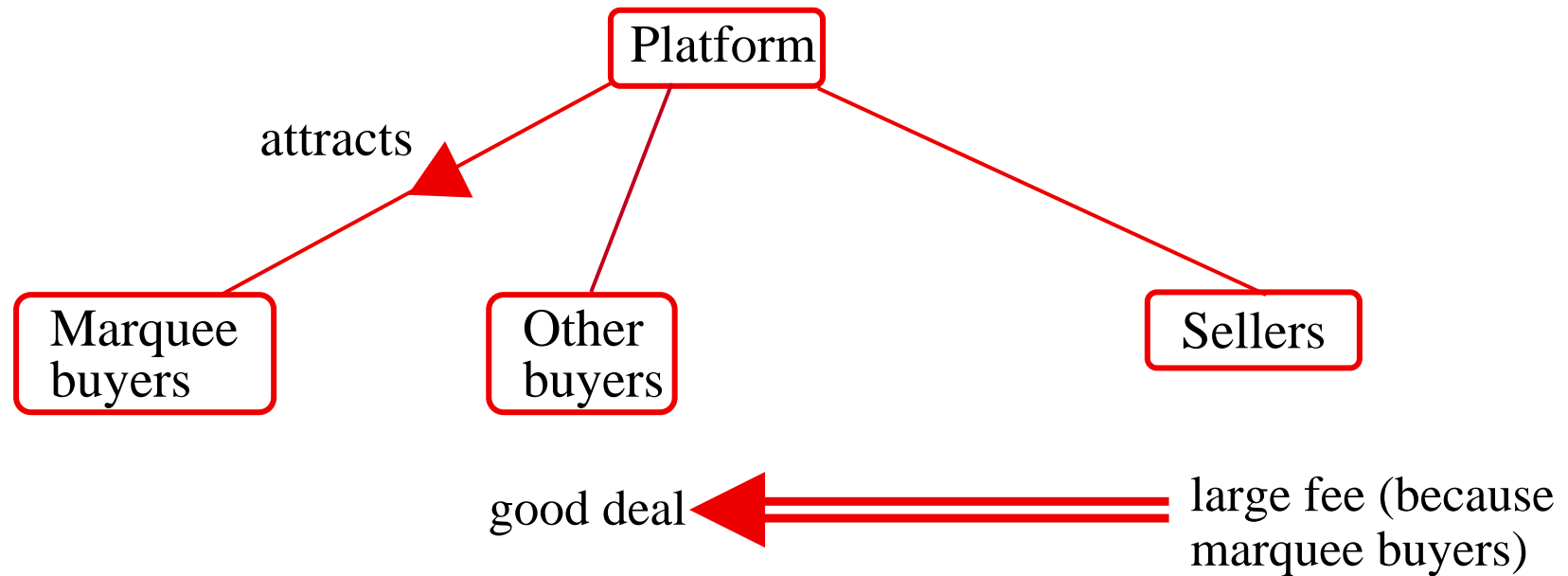
✓ *Illustration #3: skewed pricing patterns in software and telecom industries\*:*

Product	loss leader/break-even segment	profit-making segment
Operating systems (Windows, Palm, Pocket PC)	application developers (development tools, support, functionalities,...)	clients
Browsers	clients	web servers (Netscape)
DoCoMo's i - mode phone	content providers	subscribers (based on downloaded volume)

\* Evans-Hagiu-Schmalensee's forthcoming book *Invisible Engines*, MIT Press.

## *Mind the cross-group externalities*

- ✓ More complex story: within-side externality:



- Illustrations:
- Amex corporate card.
  - Killer application/game.
  - Key store in shopping mall.

## (2) *Account for sequentiality*

Sometimes chicken arrive before the eggs...: applications (or games) before operating system (console) users; platform's commitment to later attract users?

- ✓ • integrate into development,
- venture capital deals.

Typical make-or-buy cycle in two-sided markets:


- (1) vertical integration: Palm Pilot, Sun Solaris, Windows, Xbox (Halo,...),
- (2) then court external developers (open architecture, etc.)

**Palm economy:** thousands of software application and hardware add-on developers (400,000 registered developers in 2005), but provided first apps itself (e.g., Grafitti = handwriting recognition system).

- ✓ royalties (videogames).

### *(3) Regulation of interactions between end-users*


2SP performs balancing act through other instruments than membership and usage fees:

 The platform as a competition authority.


(illustrations: Windows; Palm OS licences)

 The platform as a price regulator.

(illustration: no surcharge for payments with card; iPod)

 The platform as a licensing authority.

(illustrations: exchanges: solvency requirements, prohibition of front-running; dating clubs; Nintendo's mid 80s decision to control quality of third-party games)

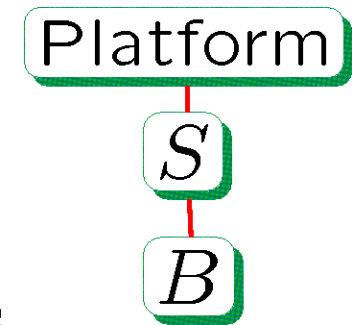
 The platform as a supplier of information and enforcement.

(illustrations: auto auctions arbitration processes, eBay's feedback forum)

👉 Useful benchmark: the *vertical view*

Example: IP-owner (platform) licenses to a seller.

Contrast two-sided market: platform has relationship with buyer; hence, more protective of buyers' interests, less protective of sellers' interests.



👉 *Key difference:*  $P$  willing to constrain  $S$ , as  $P$  can (partly) recoup benefits on  $B$  side. Hence,  $P$  regulates interactions whereas it would grant  $S$  commercial freedom under the vertical view.

(4) *What is a two-sided market?*

(a) Usage prices ( $a^B$ ,  $a^S$ ).

*Definition:* market is one-sided if volume  $V$  depends only on level  $a = a^B + a^S$ , and not on its structure. Otherwise, market is two-sided.

✓ If market is one-sided, business and public policy attention to price structure is misguided.

✓ Examples of charges in one-sided markets:

- VAT.
- Injection / withdrawal fees in electricity markets,
- Telecom charges when caller and receiver side contract.

(b) (Substantial) membership fees: almost always two-sided (allocation of per-transaction prices matters).

*For a market to be two-sided, the Coase theorem must not apply*

Coase theorem: If  $B$  and  $S$  bargain efficiently, then they (a) "maximize the size of the pie" (which depends only on  $a^B + a^S$ ) and (b) share it.

Factors conducive to two-sidedness:

- ✓ platform-imposed constraints on end-user bargaining (payment card platforms' no surcharge rule, iPod's price regulation),
- ✓ transaction costs (telecom, websites, card/cash payments when no surcharge rule,...),
- ✓ transaction-insensitive end-user costs (fixed membership fee and/or fixed cost): no ex ante bargaining among potential members.

### III. PLATFORMS' COMPETITIVE STRATEGIES IN THE ABSENCE OF INTERCONNECTION

#### (1) *Tipping*

✓ *Network externalities* → winner-takes-all effect.

- does not imply long-term dominant position: dynamic contestability:

Atari → Nintendo (+ Sega) → Sony (+ Microsoft + Nintendo)

✓ *Why two-sided markets do not necessarily tip.*

Mobile phones operating systems (Symbian, Windows CE, Palm...)

Media players (Apple Quicktime, RealPlayer, Mediaplayer, etc.)

- Differentiation:

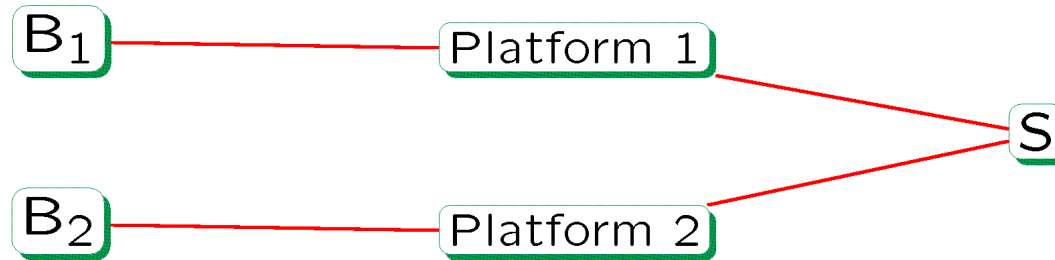
Technological niches.

Proprietary content (while publisher EA multihomes, PlayStation has 98 exclusive games, Xbox and GameCube 53 each; RealPlayer's exclusive contracts with NBA and MLB).

- Linear pricing (no fixed fee) by smaller players to induce multihoming.

(2) *Key new factor: multi-homing.*

- ✓ Suppose for example that buyers single-home while sellers multi-home:



*Single-homing side (competitive bottlenecks) treated favorably: monopoly prices in multi-homing market and low prices in single-homing one.*

*Illustrations :*

- What could happen if game developers became more prone to port games to both PlayStation and Xbox?
- Steering (story of decrease in Amex's merchant discount)  
Merchant has "first-veto right" → platforms court merchants much more than under cardholder single-homing.

## IV. PLATFORM INTERCONNECTION (telecoms, Internet)

- ✓ Two ways of achieving connectivity (reaping network externalities):
  - end user multi-homing,
  - platform interconnection.
- ✓ Latter conducive to single-homing
  - ➔ competitive bottlenecks (termination).
- ✓ *Regulation (or antitrust scrutiny)*
  - of termination charges (don't let platforms tax their rivals),
  - of network-based price discrimination (may lead to de facto breakdowns of connectivity even among equals),

Hence we assume reciprocal termination charges (at some level  $\hat{a}$ ) and no on-net/off-net price differentiation.

$a^C$  = (per minute) caller charge,  $a^R$  = (per minute) receiver charge.

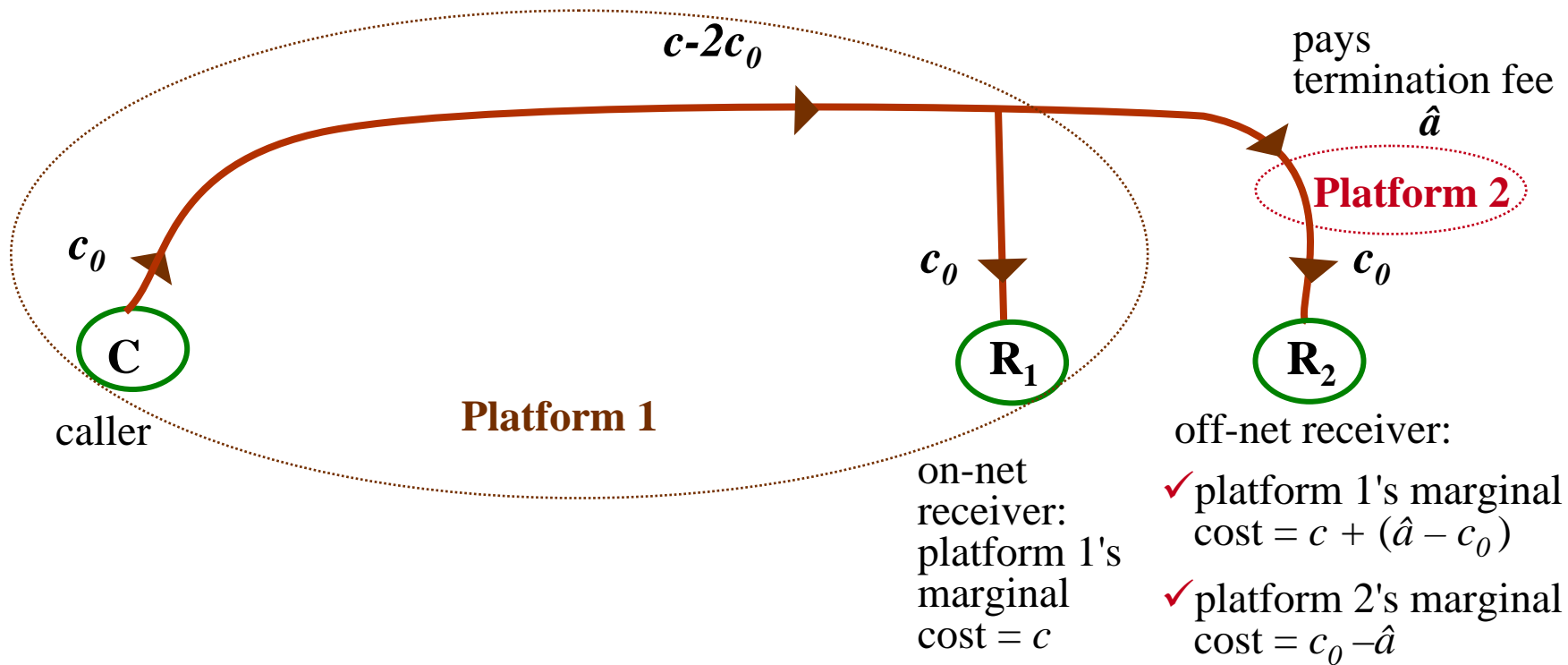
$c$  = (per minute) marginal cost of calls.

(a) *Monopoly or social planner (same price structure)*

Think of a call as a "public good" with two beneficiaries,  $C$  and  $R$ .

- ✓ Prices must allow cost recovery  
(in the absence of fixed cost,  $a^C + a^R = c$ )
- ✓ Efficient allocation of burden  
( $a^R = \beta a^C$ , where  $\beta$  is the ratio of marginal utilities of calls for receivers and callers)

(b) *Competing (sub)platforms*



$c$  = total cost per minute, includes  $c_0$  = cost of origination /termination.

*Off-net-cost pricing rule:* in equilibrium, traffic is priced *as if it were off net*:

$$a^C = c + \hat{a} - c_0$$

$$a^R = c_0 - \hat{a}$$

Socially optimal termination charge lies below cost:

$$\hat{a} = c_0 - \frac{\beta c}{1 + \beta}$$

$\hat{a} = c_0$  would have callers bear entire burden  $c$ .

## V. LOOKING AHEAD (1)

### COMPETITION POLICY IN TWO-SIDED MARKETS

- 👉 Defining relevant markets.
- 👉 Prices:
  - ✓ Predation tests.
  - ✓ Conversely high price-cost margins do not imply market power even if fixed costs are low.
  - ✓ Collusion on one side of market only (increase in competition on other side: net effect?)
- 👉 Tying: fewer constraints on price structure (debit/credit)
- 👉 Exclusionary contracts: tipping?  
(videogame platform/games, media/music and video, RealPlayer/content)

## LOOKING AHEAD (2)

### DYNAMICS

#### ✓ *Platform reputation*

- SSO as 2SP: two-sided reputation  
[must attract technology sponsors and be credible to users]
- Software: extent of commitment to APIs, to lack of backward integration into applications,...  
[difficulty to commit alters initial price structure]
- Investment bank.

## LOOKING AHEAD (3)

### INTERCONNECTION

Private and social costs and benefits of making platforms compatible?

- AOL Instant Messenger, MSN, ICQ. Multi-protocol converters.
- Multiple listing services: listed properties seen by all member agencies.

## LOOKING AHEAD (4)

### OWNERSHIP AND VERTICAL INTEGRATION

Governance of platforms?

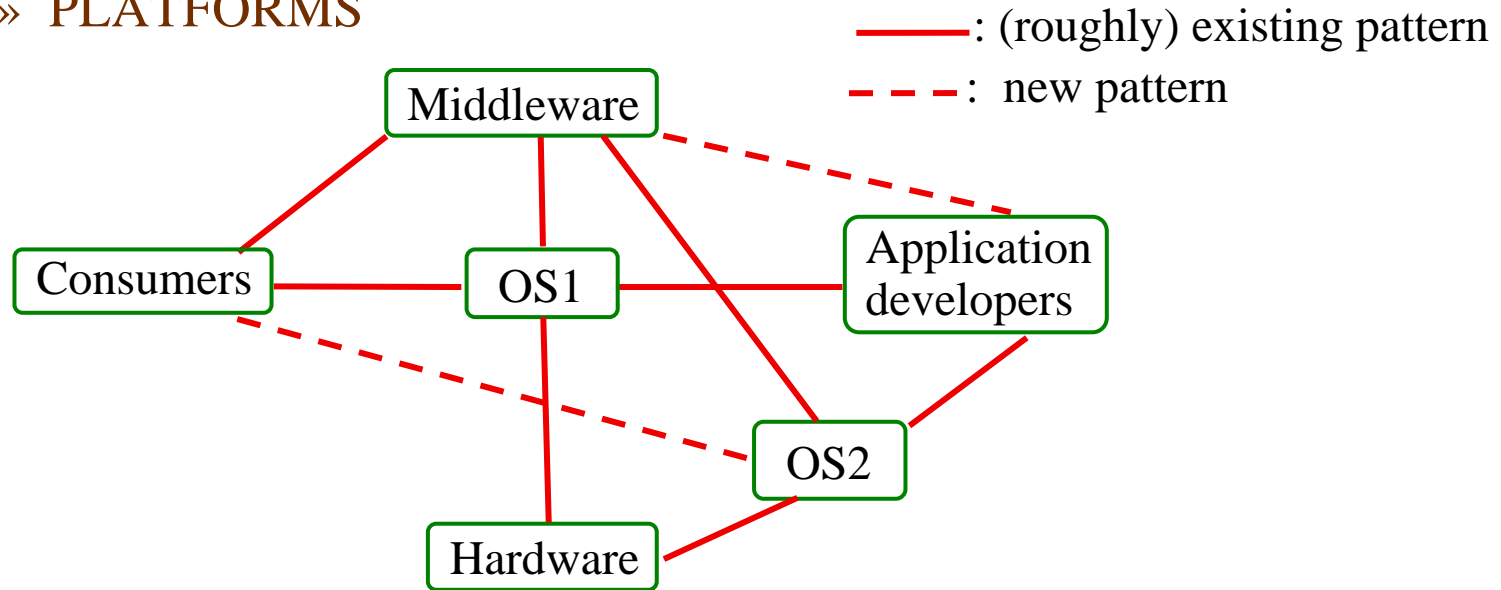
B2B, payment card platforms, etc.:

- owned by buyers, sellers, independent investors?
- for-profit or not-for-profit?
- open or closed?

## LOOKING AHEAD (5)

### « STACKED » PLATFORMS

✓ *Software:*



Middleware, not OS2, becomes new dominant platform (OS commoditized).

✓ *Payment card:* US class-action lawsuits alleging that collective fixing of interchange fee by (not-for-profit, joint-venture) Visa members is Section 1 abuse.

But-for world: issuers (Bank of America, Chase, ...) and acquirers/large merchants become 2SPs themselves. Implications for consolidation and evolution of industry?

# LOOKING AHEAD (6)

## MARKET DESIGN

(1) *Matching markets* (schools, entry-level labor markets, organ exchanges)

- ✓ Systematic relationship between market institutions and outcomes.

Example: stable matching in deferred acceptance algorithm: Best for men = men propose; best for women = women propose.

[Concrete problem: recent antitrust suit against National Resident Matching Program  
Hospitals make offers, rank residents. Wage suppression.]

- ✓ *Open question about competitive pressure*: emergence of alternative platforms

[Entry-level physicians: US and Canadian platforms; multiple kidney exchanges;...]

## (2) *Auction markets*

- ✓ *Auction design affects allocation of surplus between buyers and sellers*

Again, choice of auction design affects sharing of surplus between buyers and sellers (and, of course, platforms may also perform their balancing act through prices they charge to participants).

- ✓ *Competitive pressure: Internet platforms; stock exchanges; auction houses.*

## VII. CONCLUSION

- ✓ Substantial number of key, old and new economy, industries are two-sided markets.
- ✓ Old issues; new and challenging research and policy questions.
- ✓ We still have a lot to learn; yet a number of insights have emerged that can be useful to private and public decision-makers.