

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

Lliçó d'Economia

Universitat Pompeu Fabra,  
Facultat de Ciències Econòmiques i Empresarials,

October 11, 2006

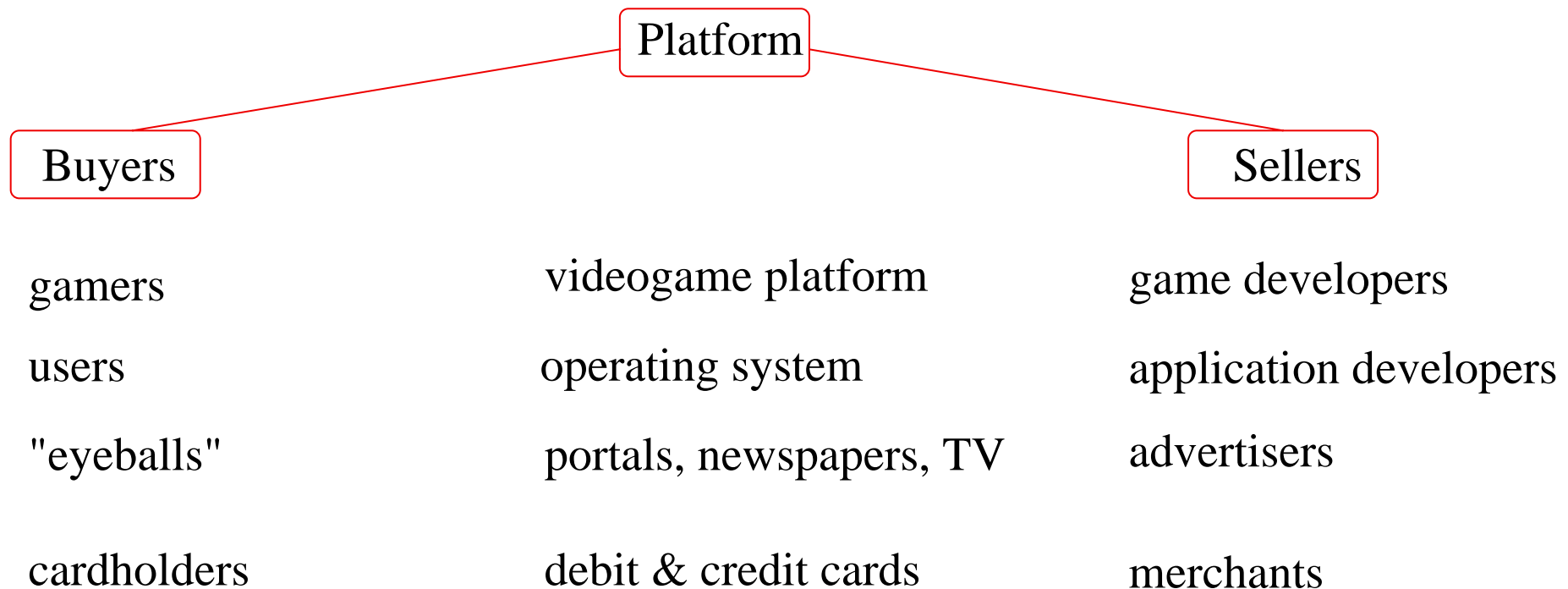
**Jean Tirole**

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...*

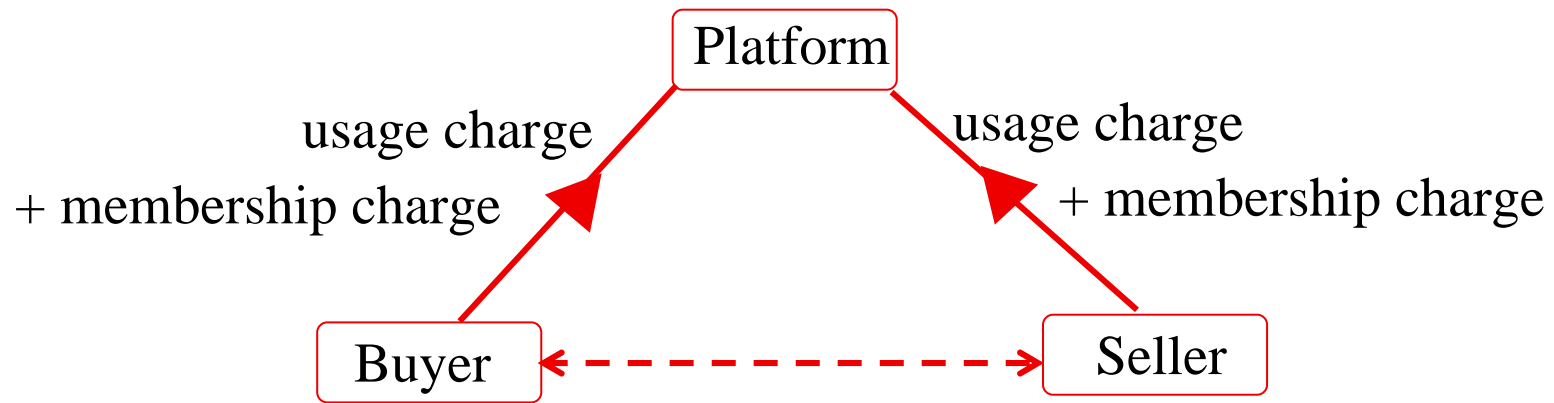
- ✓ Academic journals.
- ✓ Shopping malls.

*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.

## (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)

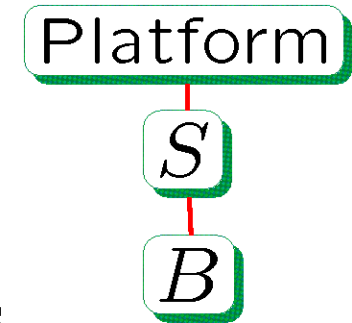
 The platform as a supplier of information and enforcement.

(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.

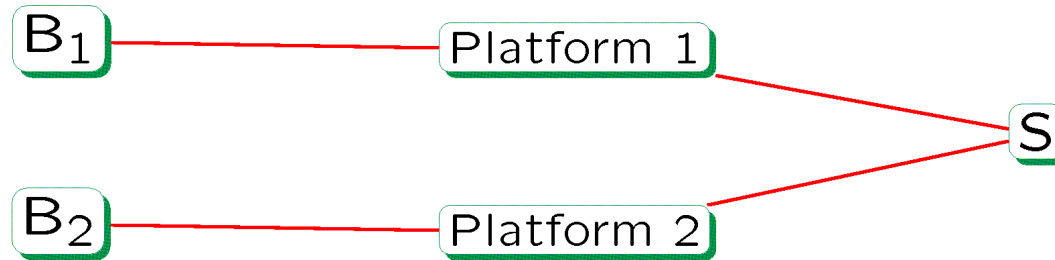
Proprietary content (while publisher EA multihomes, PlayStation has 98 exclusive games, Xbox and GameCube 53 each; RealPlayer's exclusive contracts with NBA and MLB).

- 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.

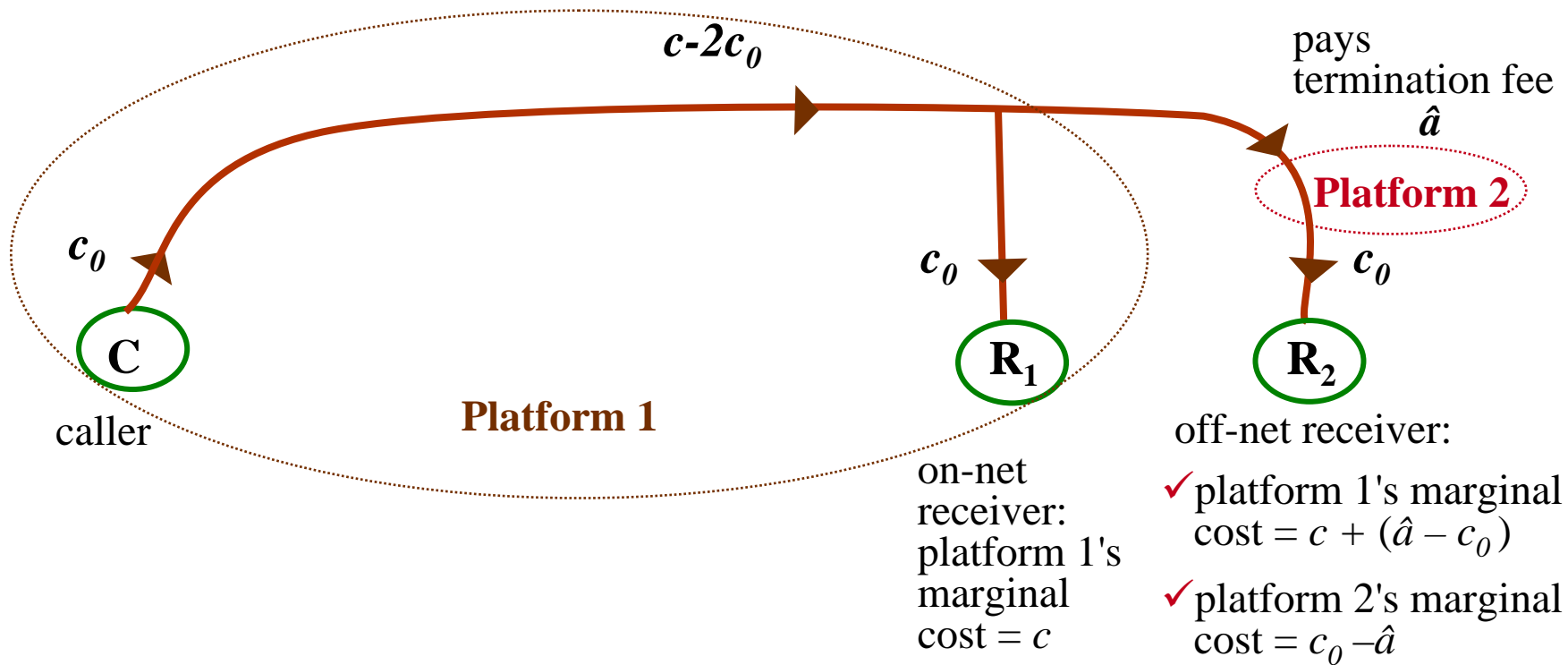
$c$  = (per minute) marginal cost of calls.

(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?

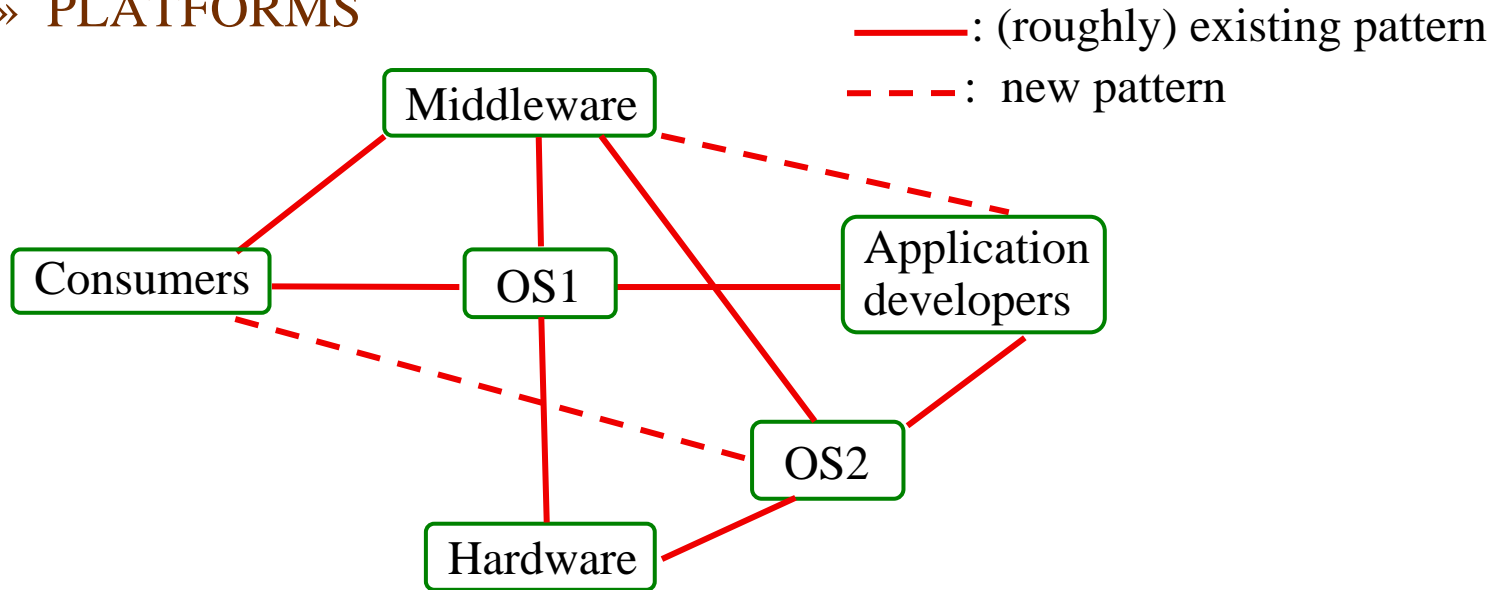
B2B, payment card platforms, etc.:

- 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.*

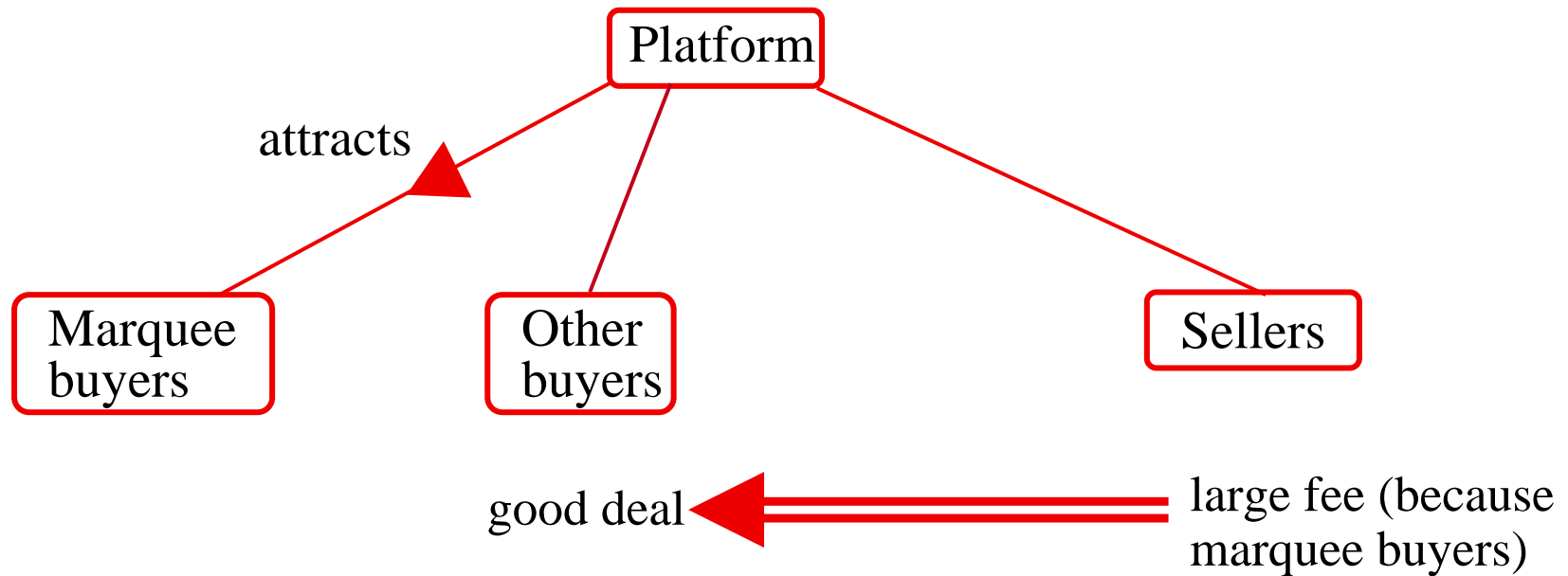
## VII. CONCLUSION

- ✓ 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.

# BACKUP

## *Mind the cross-group externalities*

- ✓ More complex story: within-side externality:



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