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

## TELECOM ITALIA LECTURE

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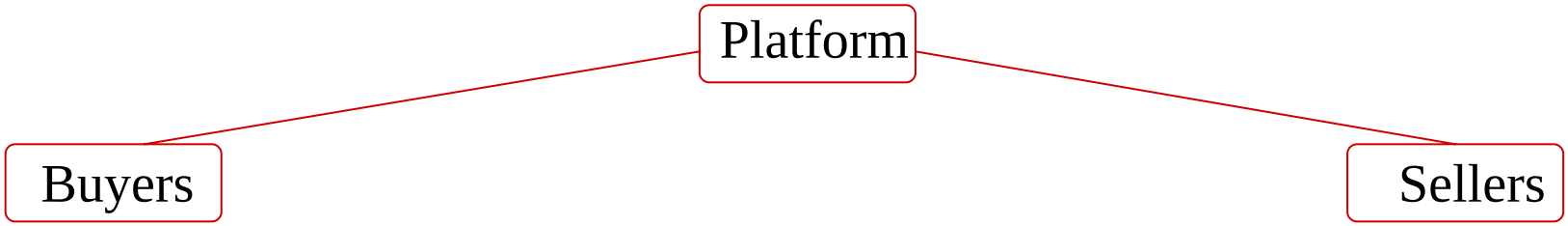
Jean Tirole
Institut d'Economie Industrielle (IDEI), Toulouse

( 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:*




| Buyers | Platform | Sellers |
|---|---|---|
| gamers | videogame platform | game developers |
| users | operating system | application developers |
| "eyeballs" | portals, newspapers, TV | advertisers |
| cardholders | debit & credit cards | merchants |

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

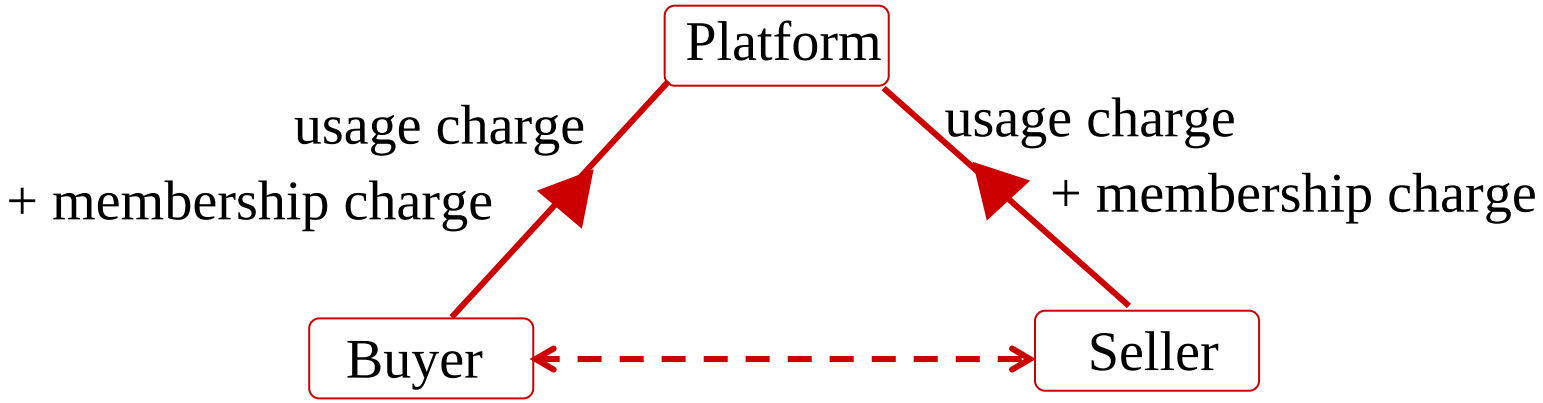
*Some other 2SPs:*

- *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 | $B$: cash-back bonuses | $B$: yearly fee |
| | $S$: merchant discount | |
| e-Bay | transaction fee | |
| | | $S$: listing fee |
| operating systems | | $B$: OS price |
| | | $S$: 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 to allocate 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,
- 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*:Videogame platforms.

Sell console at or below cost. 3DO's quick death: console priced too high.

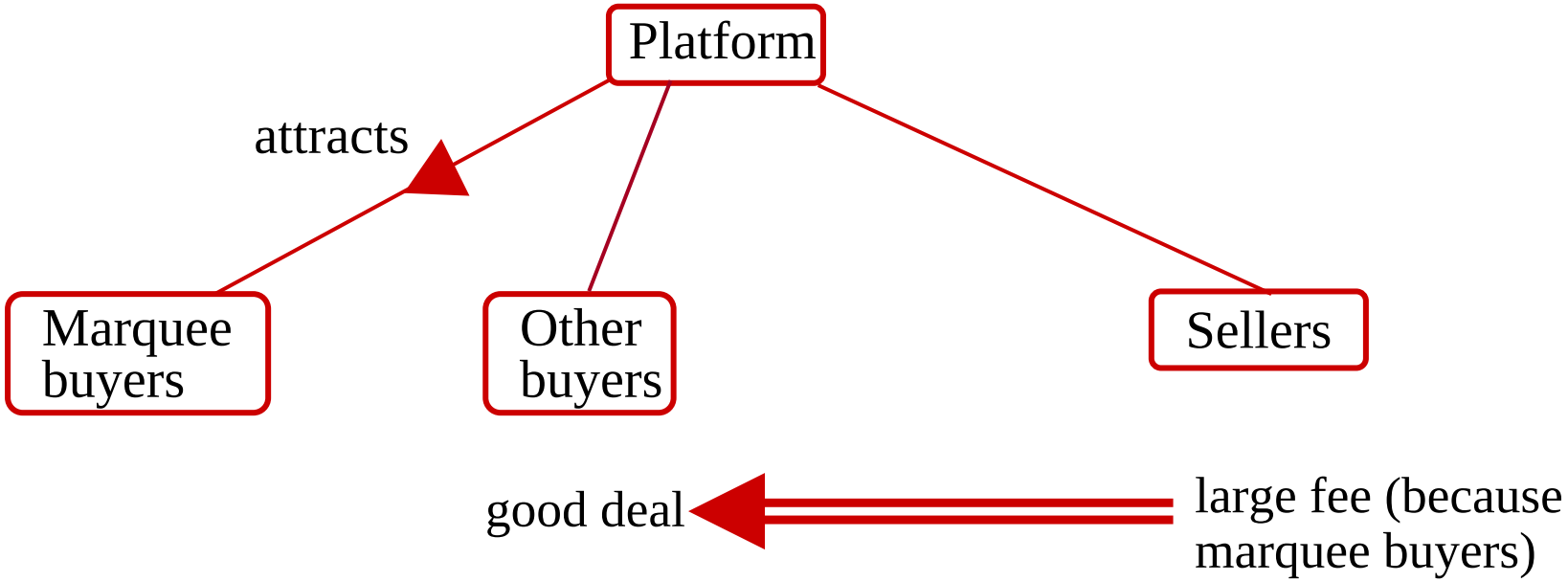
✓ *Other examples of skewed pricing patterns*:

| Product | loss leader/break-even segment | profit-making segment |
|---|---|---|
| | SOFTWARE* | |
| Browsers | clients | web servers (Netscape) |
| Operating systems (Windows, Palm, Pocket PC) | application developers (development tools, support, functionalities,...) | clients |
| DoCoMo's i - mode phone | content providers | subscribers (based on downloaded volume) |
| | PORTALS AND MEDIA | |
| Portals | "eyeballs" | advertisers |
| Newspapers | readers | advertisers |
| (Charge-free) TV networks | viewers | advertisers |
| Yellow pages | consumers | advertisers |

* Evans-Hagiu-Schmalensee's forthcoming book *Apple to Zoomer*.

*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?

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

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

(1) vertical integration: Palm Pilot, Sun Solaris, Windows, Xbox (Halo,...),

(2) then court external developers (subsidies, 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)

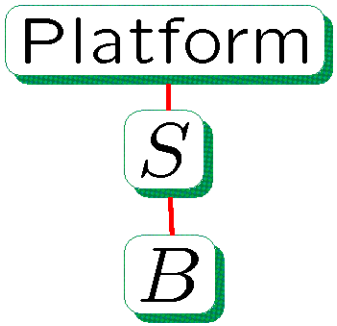
- The platform as a supplier of information and enforcement.

  (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) W*hat 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/iPod, RealPlayer, Mediaplayer, etc.)

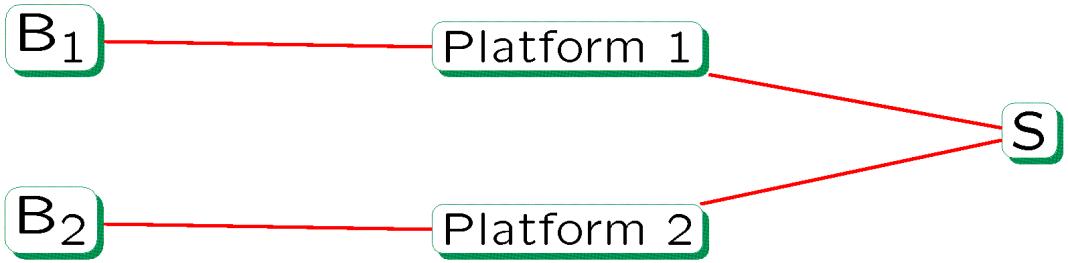
- Differentiation:

  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 weak 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 of course (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.

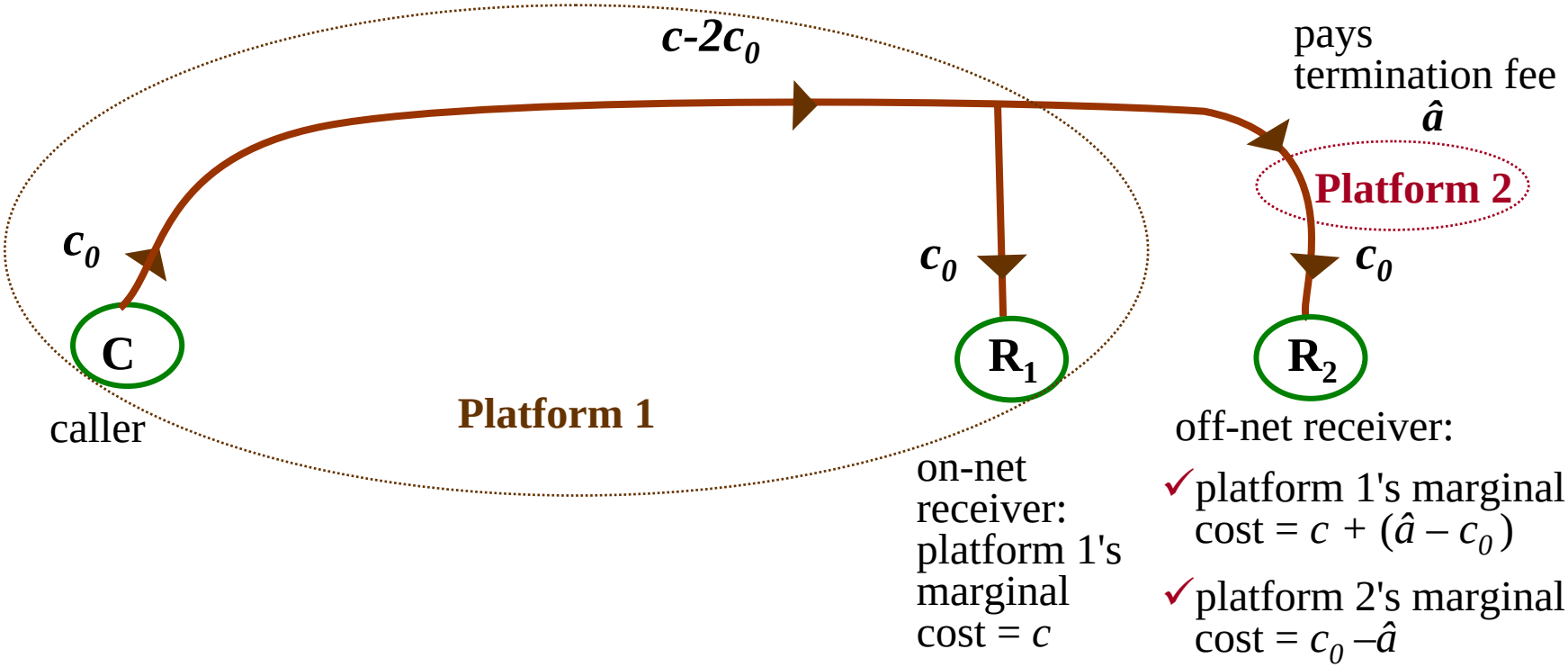
$c$ = (per minute) marginal cost of calls.

(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?

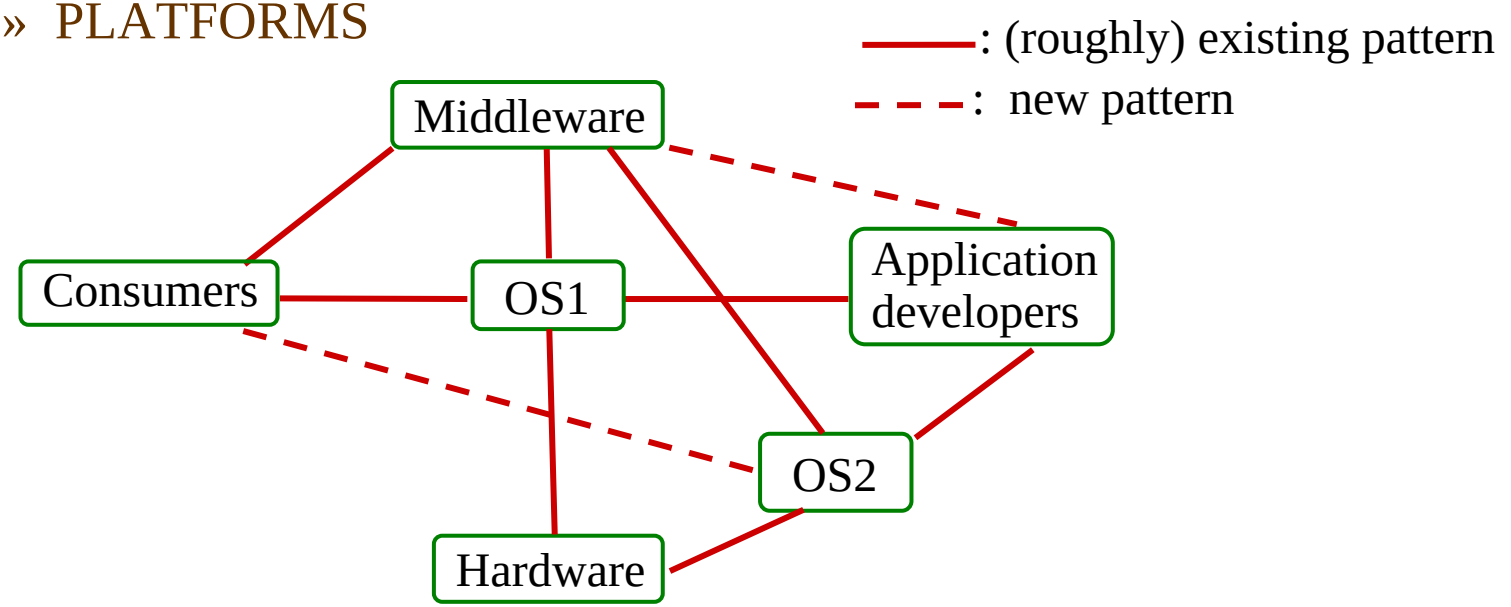
B2B, payment card platforms, etc.:

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

# 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.