

Two-Sided Markets

Xavier Wauthy

Facultés universitaires Saint-Louis
CORE, Université catholique de Louvain

Overview

- Basic intuitions
- Defining two-sided markets (2SM)
- Pricing in 2SM: key principles
- Competition in 2SM: equilibrium strategies and market outcomes
- Regulation issues

Some facts about the economic theory of 2SM

- Very recent literature (2000s')
- No canonical model yet, very few empirical studies
- early models developed for mass markets with cross externalities (payment card, matching cyber-mediaries)
- 2SM vs multi-sided markets

Examples

- Credit card operator:
 - shops accepting cards, customers holding cards
- Academic publishing:
 - distinguished authors to write articles, large audience to read them
- Real-estate agencies, Employment agencies
- Videogames:
 - developers to develop games and players to play
- Computer OS: hardware, Applications, and users
- TV broadcast: contents to broadcast, eyeballs to watch
- Telephony: callers to call, receivers to answer

Examples

- Typology (Evans, 2003)
 - Market-makers: enable transactions between parties
 - E-bay, shopping malls
 - Audience-makers: matching audience to advertisers
 - Various media, Internet portals
 - Demand-coordinators:
 - Software platforms, payment systems, mobile phone

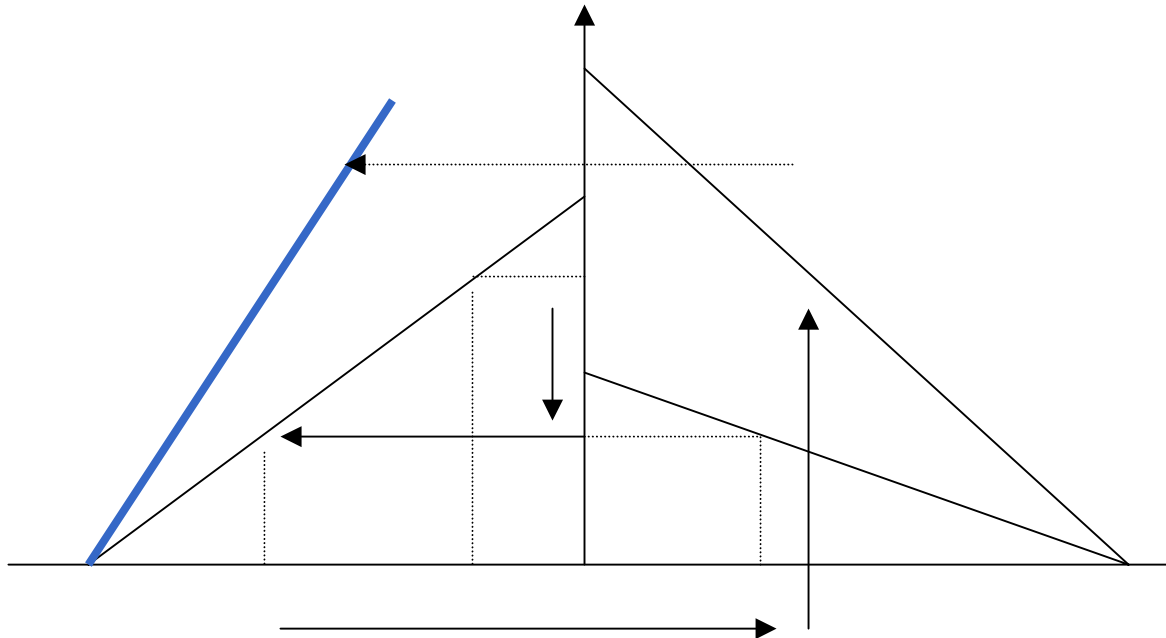
Examples: some lessons?

- Different categories of agents, groups, with « something » in the middle « matching » them
- Different pricing models are conceivable
 - But Skewed pricing is most often observed
- What makes the « value » of a product?
 - Depends on the group you belong to
 - Depends on the other groups' size and/or composition
 - Stand-alone value might be 0!
- Asymmetries in market power from one « side » to the other.

Defining 2SM (Rochet-tirole- 2007)

$$U^A = vn^B - p^A; \quad U^B = wn^A - p^B; \quad 0 \leq v \leq V; \quad 0 \leq w \leq W$$

$$D^A = 1 - p^A / Vn^B; \quad D^B = 1 - p^B / Wn^A$$



Defining 2SM

- Evans (2004)
- « At any point in time, there are
 - Two distinct groups of customers
 - The value obtained by one kind of customers increases with the number of other kind of customers
 - An intermediary is necessary for internalizing the externalities created by one group to the other. »
- Network externalities (cumulative effects),
- And complementarities (multiproduct approach)

Defining 2SM

- Rochet and Tirole (2007)
- The Price Structure matters:

$$p^A + p^B = K = p'^A + p'^B$$

=>

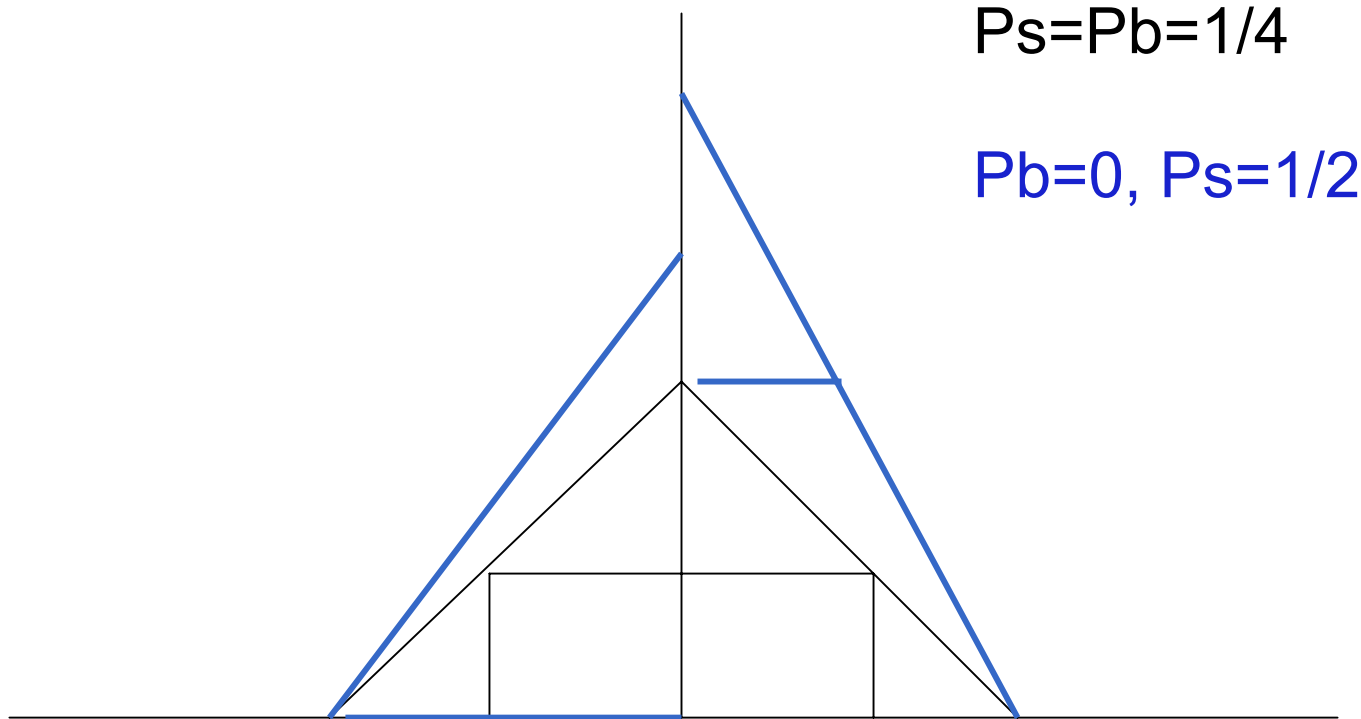
$$D^A + D^B \neq D'^A + D'^B$$

=>

Market surplus differ

- Why?
- The « platform » internalizes externalities that agents cannot internalize efficiently
 - The price structure performs precisely that!

Defining 2SM



Defining 2SM (remarks)

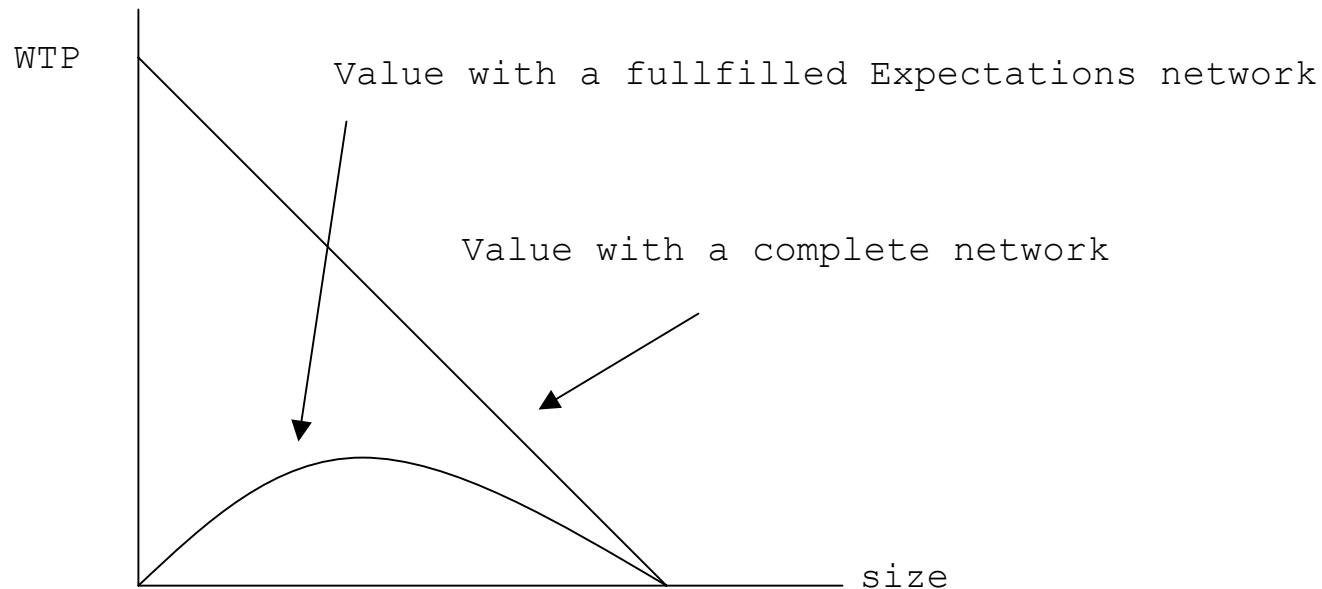
- Membership externalities and/or usage externalities?
- Monitoring issues and pricing strategies
- Vertical disintegration and 2SM

Pricing in 2SM: Key principles

- Value of an additional customer in a market with one-sided network effects?
 - His own surplus
 - + The extra surplus you can extract from the others.
- Rohlfs (BJE, 1974): critical mass

Pricing in 2SM: Key principles

- Lesson to be drawn:
 - Values are relative to the size of the network
 - Low prices may be too high prices...



Pricing in 2SM: Key principles

- In a 2SM, an additional customer on one-side increases the value of joining the platform for the other side
- The value of an extra customer =
 - The price you can charge him
 - + the extra margin it allows to extract on the other side
- Problem (?):
 - Two prices, because there are two sides
- But:
 - Two prices are needed to balance sides' interests.

Pricing in 2SM: Key principles

- Principle 1: externality-based pricing
 - Rather than cost-based pricing
 - Implication: side b's preferences « govern » pricing on side a.
 - Relative costs are merely significant
- Principle 2: Marginal cost pricing is typically inefficient
 - Subsidizing slightly one side may deeply impact utilities on the other one
- Principle 3: Charge where you can control
 - Transaction monitoring?

Pricing in 2SM: Key principles

- Principle 4: Optimize over participation level **and** transactions level.

- Example:

$$(P^b + P^s - c) N^S(P^b, P^s) N^B(P^b, P^s)$$

- Let $P^* = P^{b*} + P^{s*}$ denote total price
- For all p^* , The Price structure (P^{b*}, P^{s*}) is chosen to maximize volume
 - Ex: caller pay principle.
- P^* chosen according to the standard lerner formula
- Optimal mix of registration and transaction fees.
 - Slight subsidy on registration and positive transaction fees.

Pricing in 2SM: Key principles

- Principle 5: modified inverse elasticity rule
 - $[P^* - c] / P^* = 1/\epsilon$
 - $[P^{b*} - (c^B - P^S)] / P^{b*} = 1/\epsilon^B$
 - $[P^{b*} / P^S] = \epsilon^B / \epsilon^S$
- Intuition:
 - The opportunity cost is the cost of serving, discounted for the extra charge it allows on the other side
 - The elasticity is computed given the other side's size.
- Specifics: Marquee buyers, « must-have »

Competition in 2SM

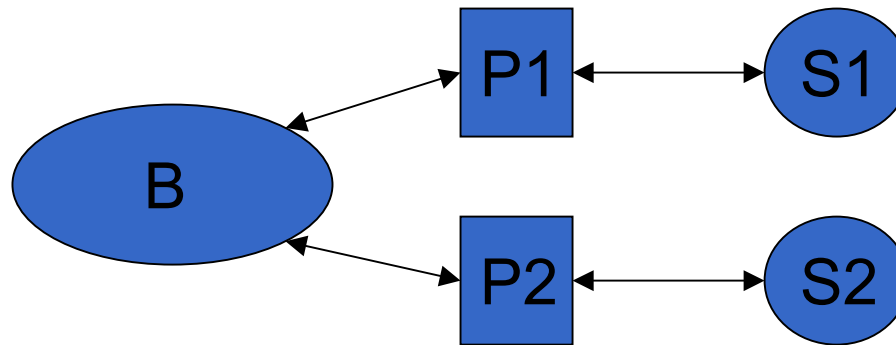
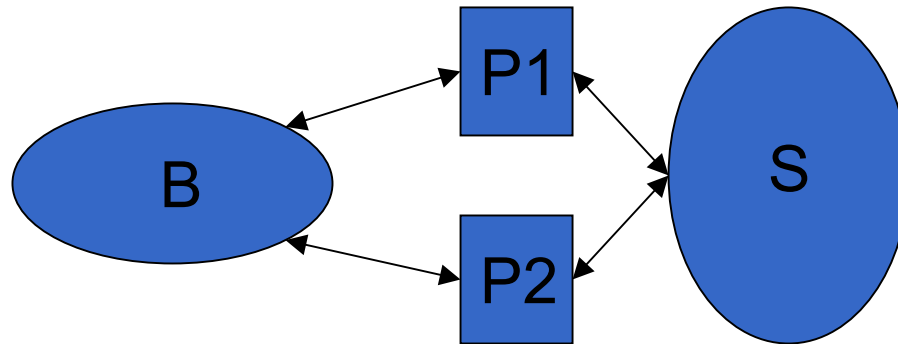
- Positive network externalities => fiercer price competition
 - Marginal revenue from an additional customer on one side increases because it means fewer customer on the competing platform
- Coordination Issues:
 - Getting both sides « on board »
 - Multiple equilibrium market outcomes
 - Diverting one side is enough
- Single-homing vs multi-homing

Competition in 2SM

- Divide and conquer (Caillaud & Jullien, 2003)
 - Subsidize one group to divert it from competitor
 - Recoup losses through margins on the other side
 - Contestable market flavour
- Mix of transactions vs registration fees
- Which group is targeted more Aggressively?
 - The more competitive one
 - The one whose externality effect is largest (i.e. other side externality parameter matters)
- Customers' heterogeneity: hierarchical networks, weaker price competition

Competition in 2SM

- Multi-homing



Competition in 2SM

- Basic intuition:
 - platform have a monopoly for access to singlehomer
 - Singlehomers are courted
 - Multihomers are exploited
- Relaxes price competition:
 - Positive profits in equilibrium are possible
 - Inefficient market structure is possible
 - Strategic use of transactions/registration fees.

Antitrust in 2SM

- The « competitive » benchmark?
 - Efficiency not achieved at marginal cost pricing
- Forget one-sided logic when dealing with antitrust issues in 2SM.
 - Ex: Implication for market definition

Antitrust in 2SM

- Evans (2002), Wright (2004): some Basic fallacies
 - High price-cost margin = market power
 - Negative price-cost margin = predation
 - Skewed price structure => cross subsidy
 - More competition => more balanced price structure