

# Multi-Sided Markets: Competing with Network Externalities and Price Discrimination

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## General model of platforms competition:

- 2 platforms,  $n$  sides, single-homing.
- Network externalities (the focus is put of “across-sides externalities”). Differentiation b/w platforms (so this is not a model of “pure network effects”): each side has an intrinsic value for the good/service offered by a platform.

## Assumptions:

- Sequential timing: the Strong platform has a Stackelberg leadership wrt the Weak platform ( $\neq$  “intrinsic quality advantage”). This allows to alleviate the coordination problem (but not completely).
- Agents tend to coordinate on the Strong platform (the “favorable expectations” assumption).
- Weak network externalities: agents value sufficiently the goods offered by the platform: even without network externalities they can decide to buy the platforms’ goods (but single-homing).

**Key question of the paper:** Is the Strong platform really strong (ie, does it have a much stronger market power than the Weak platform)?

Question: Intuition suggests that these are assumptions favorable to the emergence of a dominant player. But, is that true (“Standard” price competition with sequential timing and differentiation is favorable to the follower)?

**Insight 1:** The Strong platform cannot fully exploit its first-mover advantage because its strategy must be immune to divide-and-conquer strategy undertaken by the Weak platform.

- Insight already known from the literature on 2-sided markets and single-homing, but exposed in a much more general way in the paper. In particular, studying divide-and-conquer strategies requires to be able to rank the various sides to determine which agents will be subsidized or taxed.
- A beautiful expression emerges: in an equilibrium in which the Strong platform sells to all sides, its profit is the sum of (i) the profit the Stackelberg leader would make w/o network externalities (which depends only on the quality differentials) and (ii) the profit of the Weak platform generated by the best divide-and-conquer strategy.

**Question:** Status wrt literature? Some assumptions similar to Caillaud-Jullien but the spirit is different and this result is similar.

**Insight 2:** There exist equilibria in which the Strong and the Weak platforms share the market.

- New insight, but relatively intuitive: w/o network externalities, platforms share the market according to their relative quality advantages/niches (true?). This is robust to weak network externalities and divide-and-conquer strategies.

**Question:** Robustness of market-sharing equilibria to entry by a third platform? What if at least one side of the market is essential for the platforms? And shouldn't the "essential feature" be part of the definition of a multi-sided markets?

**Comment:** The analysis allows to offer a typology of multi-sided markets depending on (i) the fixed gains for agents to subscribe to the platforms (differentiation), (ii) the relative importance of network externalities wrt to the intrinsic values (weak or strong). Relation with the competitiveness of multi-sided markets.

**Insight 3:** Platforms competition in multi-sided markets bears some similarities with competition b/w networks and 1st degree price discrimination.

General results on the comparison between competition under 1st degree and competition under 3rd degree discrimination? Link with literature on discrimination in oligopolistic environments (eg, Stole (2004), Armstrong (2006))?

## Other (more or less relevant) points

Endogenous differentiation and comparison wrt social optimum?

Multi-homing (which typically leads to reduce the intensity of competition)?

Platforms play sequentially and agents choose simultaneously. If consumers choose sequentially, does it help in alleviating the coordination problem?

Analogy with telecoms literature?