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Warm up by revelation to cool down in competition: Strategic provision of relationship-sensitive information

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Abstract

In markets where variety-seeking consumers hold horizontally heterogeneous preferences over competing brands, product differentiation enhances brand loyalty while product complementarity stimulates multi-brand purchase. In a world of complete information, when the latter force exceeds the former, firms switch their pricing strategies from being "responsive" as Bertrand competitors, to being "independent" as local monopolies. However, when the information about product complementarity becomes asymmetric, the uninformed firm is unable to price conditional on the above two types of relationships. We characterize the pricing equilibrium and information sharing incentives between rival firms when such relationship-sensitive information is asymmetric. At the pricing stage, the informed seller can choose to charge a monopolistic price independently, or respond to the rival's price — the latter option is more attractive if a higher price can be induced. We show that, the informed seller is willing to share (resp., conceal) the information if products turn to be substitutes (resp., complements) such that competition (resp., independence) is going to take place. Moreover, the informed seller keeps silent unconditionally if the degree of complementarity is possibly high enough. Consequently, it is socially efficient to make the product complementarity information public. Our study provides new insights on data sharing strategies between platform retail verticals and third-party sellers when they supply complementary services.

Example: Multi-purchase

Two brands A and B are horizontally differentiated (Hotelling framework).

Single-purchase Each consumer buys one unit either from A or from B: Duopolists compete for the brand-switching consumer.

Multi-purchase Some consumers may be willing to buy from both: a unilateral price cut of seller A encourages more consumers who already buy B as their first product to buy A as their second product, without affecting the demand of the rival firm B.

- In the first case, sellers **compete** in prices.
- In the second case, duopolists are strategically **independent**.

Previous studies [1, 2, 3] assume the above two states to be common knowledge. In our paper, we introduce asymmetric information about firms' relationship:

- How do firms offer prices?
- Will the informed firm has an incentive to share such information to its rival firm?

Motivation

- In platform markets, compared with individual sellers, the marketplace is better informed about the consumers' purchase behavior.
- Data services of the platform provide patronized sellers only a tiny part of the whole picture.
- Self-preferencing: unfair competition between third-party sellers vs. marketplace controller retail verticals.

Outline & Results

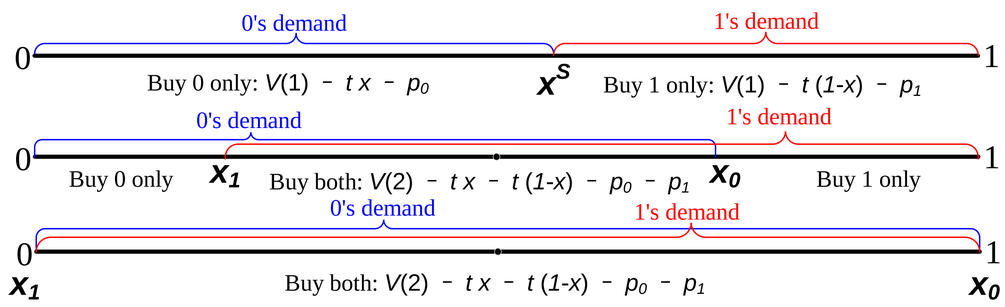
Consider the competition between an informed platform (first-party) vs. uninformed third-party. The information about multi-purchase is privately known by the former only.

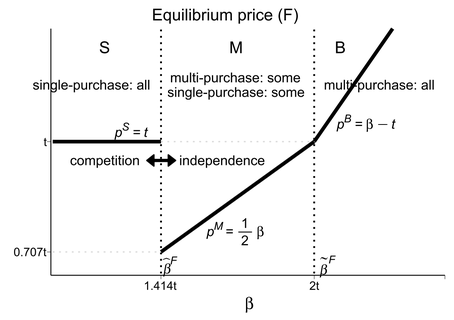
1. The optimal pricing strategies
2. The information sharing incentives
3. The socially optimal information structure

- Concealing information itself could be informative and updates the rival's belief.
- If the rival firm is going to charge a low price for an upcoming competition, then revealing the information can soften the competition.
- The primary incentives for information sharing is to avoid an intensified competition $\Rightarrow$ inducing high prices $\Rightarrow$ making such information public is socially optimal.
- Provide new strategies for platform data services.

Model & Preliminaries

Consumers are distributed over $x \in [0, 1]$. Two sellers 0 and 1 charge prices (p_0, p_1) simultaneously. Three purchase options: buying 0 only, buying 1 only and buying both.





- Assume $V(2) = V(1) + \beta$. β: degree of product complementarity (relationship-sensitive).

S Single-purchase: nobody makes multi-purchase. Sellers compete in prices: $p^S = t$.

M Multi-purchase: some but not all make multi-purchase. Sellers are independent: $p^M = \frac{1}{2}\beta < p^S$.

B A boundary case: all buyers make multi-purchase. Sellers are independent: $p^B = \beta - t > p^S$.

Asymmetric Information

Assume that β is known by seller 0 only. Seller 1 holds a uniform prior $\beta \in [0, \overline{\beta}]$ and charges a single price. By observing β, seller 0 can choose to charge a price independently p_0^M, or play a best response to seller 1 $p_0^S(p_1)$. The above options are equally profitable evaluated at $\hat{\beta}$. Then seller 1 solves

$$\max_{p_1} \int_0^{\hat{\beta}} \frac{p_1(1-x^S)}{\overline{\beta}} d\beta + \int_{\hat{\beta}}^{p_1+t} \frac{p_1(1-x_1)}{\overline{\beta}} d\beta + \int_{p_1+t}^{\overline{\beta}} \frac{p_1}{\overline{\beta}} d\beta.$$

Information Revelation

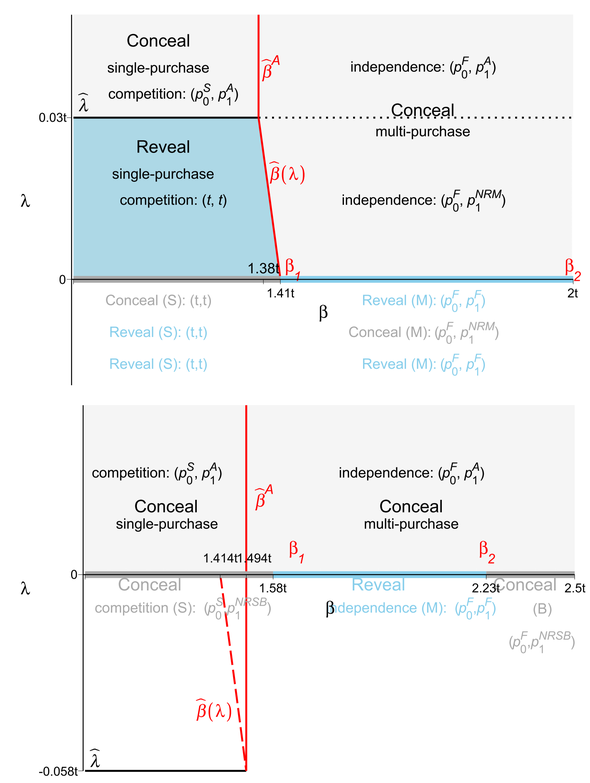
The informed seller 0 can choose to reveal or conceal the information about β. After nature assigns a true β:

1. Firm 0 can choose to reveal or to keep silent.
2. Firms offer prices simultaneously.
3. Consumers make purchase decisions.

Assumptions: The information is verifiable; Reveal: reduce to the full-information benchmark; Conceal: best response to updated beliefs; Information revealing cost: $\lambda > 0$.

- Under multi-purchase (independence): unnecessary to reveal.
- Under single-purchase (competition): depending on whether seller 1's price and sharing cost are high or low.
  - If seller 1 charges a low price making competition intensified, while sharing cost is low, then 0 should reveal.
  - If seller 1 charges a price that is high enough, then 0 should keep silent.
- The information will be revealed for the purpose of avoiding an intensified competition.
- If $\overline{\beta}$ is high enough such that seller 1 is going to charge a high price, seller 0 never reveal the information.

Reveal vs. Conceal



References

[1] Anderson, Foros, Kind, Product functionality, competition and multipurchasing. International Economic Review, 2017.

[2] Kim, Serfes, A location model with preference for variety. Journal of Industrial Economics, 2006.

[3] Jeitschko, Jung, Kim, Bundling and joint marketing by rival firms. Journal of Economics & Management Strategy, 2017.