

# Multiproduct intermediaries

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# Outline

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# Context and Tension

- Intermediaries play a central role in many markets: retailers, platforms, malls, app stores, TV platforms.
- They control product assortment and exclusivity, shaping access to consumers.
- **Tension:** DTC sales and disintermediation should weaken intermediaries.
- Yet intermediaries remain profitable, expand assortments, and rely increasingly on exclusivity.

# Motivation

- Many intermediaries sell *multiple products* and choose assortments strategically.
- Core question: how can a multiproduct intermediary create value and earn profits in the face of disintermediation?
- Standard theory: profits require lower prices or improved search.
- **This paper:** intermediaries can earn profits *purely through assortment choice*, even without lowering prices or search costs.
- Mechanism: assortment reallocates consumer search across products.

# Related Literature

## **Intermediaries:**

search, certification, information

(Rubinstein–Wolinsky 1987; Gehrig 1993; Spulber 1996; *Profits without improving search* 1996)

## **Bundling:**

pricing-based mechanisms

(Stigler 1968; Adams–Yellen 1976; McAfee et al. *Assortment-based bundling* 1989)

## **Multiproduct search:**

exogenous product ranges

(McAfee 1995; Shelegia 2012; Zhou 2014; Rhode *Endogenous assortment choice* 2015)

# Setting

## • Products / Manufacturers

- Continuum of products  $i \in [0, 1]$ , marginal cost  $c_i \geq 0$
- Demand  $Q_i(p)$ , monopoly price  $p_i^m$
- Per-consumer profit and surplus:

$$\pi_i = (p_i^m - c_i)Q_i(p_i^m), \quad v_i = \int_{p_i^m}^{\infty} Q_i(p) dp$$

## • Consumers

- Unit mass, additive utility across products
- Identical preferences; heterogeneity only in search cost  $s \sim F$
- Observe availability, not prices

## • Intermediary

- Chooses assortment  $A \subset [0, 1]$ ,  $|A| \leq \bar{m}$
- TIOLI contracts  $(\tau_i, T_i)$ , exclusive or not
- Search cost  $h(|A|) \cdot s$

# Timing

## Add a simple line, that is all, shimplesh

- ① The intermediary simultaneously makes TIOLI offers ( $\tau_i, T_i$ ) to manufacturers, specifying exclusivity or non-exclusivity. Manufacturers accept or reject.
- ② All firms that sell to consumers set retail prices for their products.
- ③ Consumers observe availability, form rational expectations over prices, then search sequentially and purchase.

# Lemma 1 (Pricing and Contracting)

## Lemma

*In any equilibrium where product markets are active:*

- ① *All sellers of product  $i$  charge the monopoly price  $p_i = p_i^m$ .*
- ② *If product  $i$  is stocked by the intermediary, there exists an equilibrium contract with*

$$\tau_i = c_i, \quad T_i = \pi_i F(v_i),$$

*both under exclusivity and non-exclusivity.*

## Add definition of $\Omega!!!!!!$

**Implication:** products can be indexed by

$$(\pi_i, v_i) \in \mathbb{R}_+^2,$$

with joint distribution  $G(\pi, v)$ .

# Simple Case: Consumer Decision

**Assumptions:** exclusivity,  $h(m) = m$ ,  $\bar{m} = 1$

Intermediary stocks  $A \subset \Omega$  exclusively.

$$\begin{aligned} \text{Visit } I \iff & \underbrace{\int_A v \, dG}_{\text{expected surplus}} \geq \underbrace{s \int_A \, dG}_{\text{search cost}} \\ \iff & s \leq \hat{v} \equiv \frac{\int_A v \, dG}{\int_A \, dG} \end{aligned}$$

*Consumers compare average surplus to their search cost.*

## Simple Case: Intermediary Problem

Consumers visiting intermediary:  $F(\hat{v})$

Net profit from product  $(\pi, v)$ :

$$\pi [F(\hat{v}) - F(v)]$$

(gains from extra consumers – lump-sum paid to manufacturer)

$$\max_{A \subset \Omega} \int_A \pi [F(\hat{v}) - F(v)] dG$$

*Low-v products earn profits. High-v products attract consumers.*

# Solution: Optimal Product Selection

## Reformulation

Stocking decision:

$$q(\pi, v) = 1 \iff (\pi, v) \in A$$

## Intermediary problem

$$\max_q \int_{\Omega} q(\pi, v) \left[ \underbrace{\pi(F(\hat{v}) - F(v))}_{\text{direct profit}} + \underbrace{\lambda(v - \hat{v})}_{\text{search externality}} \right] dG$$

## Optimal policy: cutoff structure

$$q(\pi, v) = 1 \iff \begin{cases} v < \hat{v} \text{ and } \pi \geq \frac{\hat{v} - v}{F(\hat{v}) - F(v)} \\ v > \hat{v} \text{ and } \pi \leq \frac{\hat{v} - v}{F(\hat{v}) - F(v)} \end{cases}$$

High- $\pi$ , low- $v$  products make money. Low- $\pi$ , high- $v$  products attract consumers.

Clarify the constraint, where does it come from

# Solution: Optimal Product Selection

mention proposition 1?

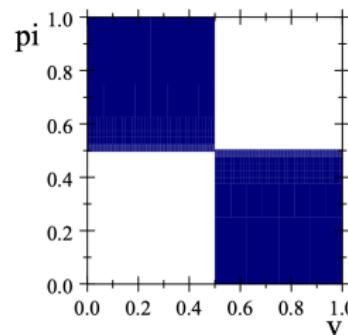


Figure 1: Optimal product range in the simple case

# Beyond the Simple Model

- The paper extends the benchmark to a richer environment:
  - endogenous exclusivity vs non-exclusivity
  - capacity constraint on assortment size ( $\bar{m}$ )
  - general search cost technology  $h(m)$
- **Key insight:** the same search-reallocation mechanism survives, but now interacts with:
  - the exclusivity margin
  - the capacity margin
- As a result, the intermediary may optimally stock:
  - traffic-generating products
  - profit-generating products
  - *and* products that do both.

# Applications (Overview)

- **Retail platforms / malls**

- Some products are used to *attract consumers* (anchors), others to *generate profits*.
- Explains subsidies to high-value sellers and cross-store externalities.

- **Exclusivity and private labels**

- Exclusive products optimally have high consumer surplus but low standalone profitability.
- Predicts overuse of exclusivity relative to the social optimum.

- **Direct-to-consumer (DTC) sales**

- Easier DTC weakens the intermediary and shrinks its assortment.
- Intermediaries respond by relying more on exclusivity.

*Applications illustrate the mechanism; the contribution is the framework.*

# Summary

- Introduces a new framework to study multiproduct intermediaries with consumer search frictions and endogenous assortment.
- Main result: a multiproduct intermediary can earn strictly positive profits *without improving prices or search efficiency*.
- Mechanism: assortment choice reallocates consumer search across products with different roles.
- The framework provides a unified way to think about exclusivity, capacity, and DTC competition.

# Discussion and Limitations

- **Scope of the pricing environment**

- Prices are fixed at monopoly levels to isolate pure assortment and exclusivity effects.
- The paper establishes profitability under this austere benchmark, but does not quantify how strong these forces are relative to pricing distortions.

- **Absence of intermediary competition**

- The analysis focuses on a single intermediary.
- With competing intermediaries, exclusivity may be disciplined by consumer switching and differentiation, potentially altering welfare conclusions without eliminating profitability.

- **Consumer search structure**

- Consumer heterogeneity operates solely through search costs.
- The sensitivity of the mechanism to alternative forms of consumer search or platform choice is not fully characterized.